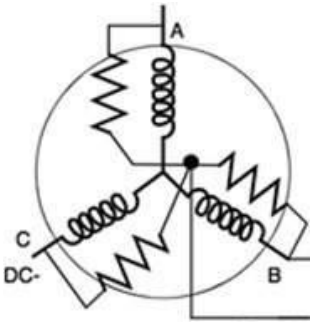
VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad

SYLLABI UNDER CBCS FOR
SECOND YEAR B.E (EEE)
WITH EFFECT FROM 2017-18
(For the students admitted in 2016-17)



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
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VISION OF THE DEPARTMENT

"Excellence in quality education by keeping pace with rapidly changing technologies and to create man power of global standards in the field of Electrical and Electronics Engineering."

MISSION OF THE DEPARTMENT

"To impart knowledge to electrical engineering students so that they have the skills to innovate, excel and lead in their professions with values for the benefit of the society."

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION
B.E III- SEMESTER UNDER CBCS WITH EFFECT FROM 2017-2018

Course Code	III SEMESTER								Credits
	Course Name	Scheme of Instruction Hours per week				Scheme of Examination			
		L	T	D	P	Duration in Hours	Max. Marks		
	Theory						SEE	CIE	
BS310MA	Partial Differential Equations and Numerical Methods	3	1	0	0	3	70	30	3
MC320CE	Environmental Science	2	0	0	0	3	70	30	2
HS310EH	FS-I: Communication Skills in English-I	2	2	0	0	3	70	30	2
MC310ME	Introduction to Entrepreneurship	1	0	0	0	2	35	15	1
OE3XXXX	Open Elective - I	2	0	0	0	3	70	30	2
PC310EC	Electronics Engineering-I	3	0	0	0	3	70	30	3
PC320EE	Electromagnetic Field Theory	3	1	0	0	3	70	30	3
PC330EE	Electrical Circuits-I	3	1	0	0	3	70	30	3
PC340EE	Electrical Machines-I	3	1	0	0	3	70	30	3
	LABS								
PC311EE	Electrical Circuits Lab	0	0	0	2	3	50	25	1
PC321EC	Electronics Engineering Lab-I	0	0	0	2	3	50	25	1
Total		**22**	**6**	**0**	**4**		**695**	**305**	**24**
		32					**1000**		

SEE- Semester End Examination **CIE- Continuous Internal Assessment**

With effect from the Academic Year 2017-18

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
PARTIAL DIFFERENTIAL EQUATIONS AND NUMERICAL METHODS

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : BS340MA
Credits : 3	CIE Marks: 30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	*At the end of the course students will be able to:*
1. Formulate and solve linear and nonlinear partial differential equations. 2 ***Study*** the Fourier series, conditions for expansion of function and half range series 3 Apply partial differential equations to engineering problems viz., wave, heat and Laplace's equations. 4 ***Study*** the methods to solve equations, apply numerical methods to interpolate, differentiate and integrate functions and to solve differential equations using numerical methods and solve systems of equations. 5 *Understand* fitting of a straight line to a given data and measuring Correlation between variables.	a) ***Find t***he Partial differential equations by eliminating arbitrary constants and functions and solve linear, nonlinear Partial differential equations b) ***Expand*** any function which is continuous, discontinuous, even or odd in terms of its Fourier series. c) students will be able to solve wave, heat and Laplace's equations in engineering problems. d) ***Solve*** algebraic and transcendental equations using Bisection method Regula-Falsi, Newton-Raphson, apply numerical methods to interpolate, differentiate functions, solve systems of equations and solve differential equations using numerical methods. e) ***Solve*** problems on fitting of a straight line to the given data and to find co-efficient of correlation and to determine regression lines and their application problems

Unit-I (10 classes)

Fourier Series: Expansion of a function in Fourier series for a given range-odd and even functions of Fourier series change of interval - Half range sine and cosine expansions-Applications of Fourier series-Square wave forms-Saw tooth wave form.

Unit –II (10 Classes)

Partial Differential Equations: Formation of partial differential equations of first order- Lagrange's solution – standard types – Charpit's method

Unit – III (10 Classes)

Applications of Partial Differential Equations: Method of separation of variables **-**Solution of one dimensional wave equation – One and Two Dimensional Heat equation and Laplace's Equation (Polar and Cartesian).

Unit –IV (12 Classes)

Numerical Methods: Bisection method- Regula-Falsi method-Newton's-Raphson's method- Introduction to difference operators with equal and unequal intervals – Interpolation - Newton's Forward and Backward difference Interpolation formulas- Lagrange's Interpolation - Newton's divided difference interpolation - Numerical differentiation - Solution of Differential equations by Runge–Kutta Method of 4^{th} order(without proofs).

Unit –V (8 Classes)

Curve Fitting: Curve fitting by the Method of Least Squares - Fitting of Straight line – Regression - Lines of Regression - Correlation – Karl Pearson's Co-efficient of Correlation.

Suggested Reading:

1. E. Kreyszig. Advanced Engineering Mathematics – Wiley Eastern Ltd., 8^{th} Edition, New Delhi, 2006.
2. R.K. Jain & S.R.K. Iyengar**,** Advanced Engineering Mathematics – Narosa Publications, 2005.
3. B.S. Grewal, Higher Engineering Mathematics, Khanna Publications, 34^{th} Edition, 1998.
4. B.S.Grewal, Numerical methods, Khanna Publishers

With effect from the Academic Year 2017-18

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
ENVIRONMENTAL SCIENCE

Instruction: 2Hrs /week	SEE Marks :70	Course Code : MC320CE
Credits : 2	CIE Marks: 30	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
In this subject the students will	*Upon the completion of this course students will be able to*
1. Describe various types of natural resources available on the earth surface. 2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems. 3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity. 4. Explain the causes, effects and control measures of various types of environmental pollutions. 5. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, various types of disasters and their mitigation measures.	1. Describe the various types of natural resources. 2. Differentiate between various biotic and abiotic components of ecosystem. 3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India. 4. Illustrate causes, effects, control measures of various types of environmental pollutions. 5. Explain the methods of water conservation, causes, effects of climate change, global warming, acid rain and ozone layer depletion, various types of disasters and their mitigation measures.

UNIT-I

Environmental Studies: Definition, importance of environmental studies. Natural resources: Water resources; floods, drought, conflicts over water, dams-benefits and problems. Food resources; Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

UNIT-II

Ecosystems: Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystem (ponds, oceans, estuaries).

UNIT-III

Biodiversity: Genetic species and ecosystem diversity. Values of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

UNIT-IV

Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste & e-waste management.

UNIT-V

Social Aspects and the Environment: Water conservation, Climate change, global warming, acid rain, ozone layer depletion. Environmental Impact Assesment, population explosion.

Suggested Books:

1. Deswal S. and Deswal A., A Basic Course on Environmental studies, Dhanpat Rai & Co Pvt. Ltd. 2013.
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2006.
3. Suresh K. Dhameja, Environmental Studies, S.K. Kataria & Sons, 2010.

References Books:

1. De A.K., Environmental Chemistry, New Age International, 2003.
2. Odum E.P., Fundamentals of Ecology, W.B. Sunders Co., USA, 2004.
3. Sharma V.K., Disaster Management, National Centre for Disaster Management, IIPE, Delhi, 2013.
4. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E. III-SEMESTER
FS-I: COMMUNICATION SKILLS IN ENGLISH-I

Instruction:2+2Hrs/ Week	SEE Marks: 70	Course Code: HS310EH
Credits: 2	CIE Marks: 30	Duration of SEE: 3 Hrs

Course Objectives	Course Outcomes
• The four major skills of language learning, listening, speaking, reading and writing provide the right key to success. • The main objective of this finishing school curriculum is to involve content for all the above mentioned four skills in teaching English and to get students proficient in both receptive and productive skills	• Respond to questions and Engage in an informal conversation. • Narrate a message/story/incident, both verbally and in writing. • Describe an event/a session/ a movie/ an article. • Respond to others while being in a casual dialogue. • comprehend facts given and respond in an appropriate manner. • Construct sentences in a coherent form • Provide explanations • Recognize and list the key points in a topic/message/article. • Participate in group and forum discussions by providing factual information, possible solutions, and examples. • Debate on a topic by picking up the key points from the arguments placed. • Provide logical conclusions to the topics under discussion. • Prepare, present, and analyze reports

UNIT I – FUNDAMENTALS OF COMMUNICATION
Competencies:

- Basic conversational ability.
- Write e-mails introducing themselves & their purpose

Topics covered

Greeting and Introductions

Small Talk

Recalling

Topic Level Details

Greeting & Introductions

Competencies:

- Greeting appropriately
- Introducing themselves, a friend
- Responding to simple statements and questions both verbally and in writing
- Seeking introduction from others about themselves or about any topic.
- Writing an email with appropriate salutation, subject lines, self introduction, and purpose of mail.

Small Talk

Competencies:

- Identifying the topic of conversation.
- Speaking a few sentences on a random list of topics
- Reading simple information like weather reports, advertisements
- Seeking clarifications.

Recalling

Competencies:

- State takeaways from a session or conversations

UNIT II : NARRATIONS AND DIALOGUES

Competencies:

- Framing proper phrases and sentences to describe in context
- Speaking fluently with clarity and discrimination
- Responding to others in the dialogue.

Topics covered

Paraphrasing

Describing

Topic Level Details

Paraphrasing

Competencies:

- Listen for main ideas and reformulating information in his/her own words
- Draw appropriate conclusions post reading a passage.
- Writing an email confirming his/her understanding about a topic

Describing

Competencies:

• Speaking, Reading, and Writing descriptive sentences and paragraphs.

UNIT-III: RATIONAL RECAP

Competencies:

- Organizing and structuring the communication
- Detailing a topic
- Summarizing a topic.

Topics Covered:

Organizing

Sequencing

Explaining

Summarizing

Topic Level Details

Organizing

Competencies:

- Organizing the communication based on the context and audience

Sequencing

Competencies:

- Structuring the content based on the type of information.

Explaining

Competencies:

- Explaining a technical/general topic in detail.
- Write an email giving detailed explanation/process

Summarizing

Competencies:

- Recapitulating

UNIT-IV: PROFESSIONAL DISCUSSIONS AND DEBATES

Competencies:

- Analytical and Probing Skills
- Interpersonal Skills

Topics Covered:

Discussing

Debating

Topic Level Details

Discussing

Competencies:

- Thinking
- Assimilating

Debating

Competencies:

- Comprehending key points of the debate and note decisive points including supporting details.
- Construct a logical chain of arguments and decisive points.
- Writing a review about a product by providing reasons, causes, and effects

UNIT -V: DRAWING CONCLUSIONS AND REPORTING

Competencies:

- Reasoning skills - Coherent and logical thinking
- Reporting and Analyzing skills.

Topics Covered:

Concluding

Reporting

Topic Level Details

Concluding

Competencies:

- Analyzing the points discussed.
- Connecting all points without gaps.
- Identifying clinchers.
- Communicating the decisions

Reporting

Competencies:

- Reporting an incident
- Writing/Presenting a project report

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
INTRODUCTION TO ENTREPRENEURSHIP

Instruction:1 Hours /week	SEE Marks :35	Course Code : MC310ME
Credits : 1	CIE Marks: 15	Duration of SEE : 2 Hours

Course objectives	Course Outcomes
The objectives of this course are to: • inspire students and help them imbibe an entrepreneurial mind-set. • introduce key traits and the DNA of an entrepreneur • provide the information about the facilities , schemes available to start enterprise in INDIA • educate the government policies and support structure for the entrepreneur • improve the entrepreneur skills	On completion of the course, the student will be able to: • develop awareness about entrepreneurship and successful entrepreneurs. • generate and analyse the business ideas • understand the supporting organizations available to establish the business in the country • understand the different government policies which support the entrepreneur • understand how to Prepare a business plan report

Unit-I: Entrepreneurship: Entrepreneur characteristics – Classification of Entrepreneurships – Incorporation of Business – Forms of Business organizations –Role of Entrepreneurship in economic development –Start-ups.

Unit-II: Idea Generation and Opportunity Assessment: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.

Unit-iii: Institutions Supporting Small Business Enterprises: Central level Institutions: NABARD, SIDBI, NIC, KVIC, NIESBUD,SIDO, DST,EDI,FICCI,CII,ASSOCHAM etc. – state level Institutions –DICs- SFC-SIDC- Other financial assistance.

Unit-IV: Government Policy and Taxation Benefits: Government Policy for SSIs- tax Incentives and Concessions –Non-tax Concessions –Rehabilitation and Investment Allowances.

Unit-V: entrepreneurial skills-design thinking, selling and communication. Project Formulation and Appraisal: Preparation of Project Report –Content; Guidelines for Report preparation, project report and pitching

Learning Resources:

1. Bruce R. Barringer and R. Duane Ireland, "Entrepreneurship: successfully launching new ventures", 3rd edition, Pearson Prentice Hall, 2009.
2. P. Denning and R. Dunham, "The Innovator's Way", MIT Press: Cambridge, Massachusetts, 2010.
3. Arya Kumar, "Entrepreneurship", Pearson Education, Delhi, 2012.
4. Michael H. Morris, D.F.Kuratko, J G Covin, "Corporate Entrepreneurship and Innovation", Cengage learning, New Delhi,2010
5. Peter F. Drucker, "Innovation and Entrepreneurship", Routledge Classics, 2015 .
6. https://www.wfglobal.org/initiatives/national-entrepreneurship-network

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
ELECTRONICS ENGINEERING-I

Instruction:3 Hours /week	SEE Marks :70	Course Code : PC310EC
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course Objective:	Course Outcomes
To familiarize the students with various electronic devices working and analyzation and design of simple real time electronic products.	**At the end of the course students should be able to:** • Define and describe the principle of operation of electronic devices like PN junction diode, Zener diode, BJT and FET etc. • Analyze and design various rectifier circuits with and without filters for a regulated DC power supply. • Illustrate the use of diode in practical applications and gain knowledge on special diodes. • Analyze and compare the small signal low frequency Bipolar Junction Transistor and Field effect transistor amplifiers in different configurations with the help of their equivalent circuits.

UNIT – I

Semiconductor diodes and Rectifiers: Review of semiconductor physics, p-n junction as a rectifier, V-I characteristics, temperature dependence of V-I characteristics; Breakdown of junctions-Zener and Avalanche. Half wave, full wave, bridge rectifiers, L, C, π-section filters; Regulation and Ripple characteristics

UNIT – II

Transistors and their biasing: BJT, current components; CE, CB, CC configurations; characteristics. Transistor as an amplifier; h-parameters; Analysis of CE, CB, CC amplifiers. Operating point, bias stability, stabilization circuits, fixed bias, collector to base bias and Emitter bias.

UNIT – III

Field Effect Transistors and their biasing: Principles of V-I characteristics of JFET and MOSFETs; Depletion and Enhancement modes, small signal equivalent circuit, FET as a CS amplifier. Biasing of JFET's and MOSFET's source self-bias, biasing for zero current drift, biasing against device variations, Characteristics of UJT, SCR, DIAC & TRIAC.

UNIT – IV

Low frequency BJT amplifier Circuits: Cascading amplifier stages, simplified analysis for three amplifier configurations, Miller's Theorem-High input impedance transistor circuits, cascade configuration, Difference amplifier.

UNIT – V

Multistage amplifiers: Classification of amplifiers, Distortion in amplifiers, Frequency response of RC coupled amplifiers, effect of emitter (source) by pass capacitor on LF response, Transformer coupled amplifiers, step response, Bandwidth of cascaded stages.

Suggested Books:

1. Jacob Millman and Halkias," Electronic devices and circuits", 2nd Edition 2010, Mc Graw Hill Publication.
2. Jacob Millman, Christos C. Halkias, "Integrated electronics: analog and digital circuits and systems", 2nd Ed., 2010, Mc Graw-Hill.

Reference Books:

1. David Bell, "Fundamentals of Electronic Devices and Circuits", 5th Edition2008, Oxford University Press.
2. Donald L schilling & Charles Belove, Electronic circuits: Discrete & Integrated, 3rd Edition,1989, McGraw Hill International.
3. Robert L. Boylestad, Louis Nashelsky "Electronic Devices and Circuit Theory", 10th Edition2009, PHI.

Online resources:

1. http://nptel.ac.in/courses/

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
ELECTROMAGNETIC FIELD THEORY

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : PC320EE
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course objective:	Course Outcomes:
To impart the fundamentals and applications of Electromagnetic fields such that student will be able to understand, develop, and design various engineering applications involving electromagnetic fields	Upon completion of this course the students will be able to 1. Apply Coulomb's Law and Gauss's Law to evaluate Electric field Intensity and Potential due to various configurations in different co-ordinate systems 2. Evaluate Electric Field Intensity due to dipole and energy stored in electric field. 3. Apply the concepts of electrostatic fields to evaluate capacitance of different physical systems 4. Apply Biot-Savart's Law and Ampere's law to determine magnetic field Intensity due to various configurations in different co-ordinate systems. 5. Apply Maxwell's equations to solve boundary Value problems in electric and magnetic fields. 6. Apply the concepts of time varying Electromagnetic fields to solve problems on different electromagnetic wave propagations. 7. Explore the concepts of Electromagnetic compatibility to minimize the electromagnetic Interference.

UNIT-I

Vector Analysis: Scalars and Vectors, Vector Algebra, The rectangular, Circular cylindrical, Spherical coordinate Systems and transformations, Vector Calculus.

Electrostatic Fields: Coulomb's law and Electric Field Intensity, Electric Fields due to continuous charge distribution; Electric flux density – Gauss's law ;Maxwell's Equation– Applications Gauss's law; Electric Potential; Relationship between E and V- Maxwell's Equation; Energy Density in Electrostatic Fields.

UNIT-II Electric Fields in Material Space:
Convection and Conduction current Densities ,Conductors, Polarization in Dielectrics; Dielectric Constant; Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field Continuity Equation and Relaxation time; Boundary Conditions; Electrostatic Boundary Value Problems Poisson's and Laplace equations –Uniqueness theorem, Analytical solutions – By direct integration (One dimensional),– Capacitance – Capacitance of parallel plate and spherical and coaxial capacitors with composite dielectrics.

UNIT -III
Magneto static fields: Biot-Savart's law and Ampere's Circuit law- Maxwell's Equation-Applications Ampere's Law-Magnetic Flux Density, Maxwell's Equation -Magnetic scalar and vector potentials- magnetic materials – forces in magnetic fields Lorentz force equation – force between parallel conductors – magnetic torque and Dipole moment – inductance calculations (Solenoid, Toroids, Parallel transmission line)-Mutual inductance – Integral and point forms of Maxwell's magneto static equation. Magnetic boundary conditions

UNIT-IV Time Varying Electromagnetic fields and Maxwell's equations: Faraday's law Displacement current – Maxwell's equations in point form and integral form – power and Poynting theorem – Time harmonic electromagnetic fields – wave equations (one dimension) – plan wave propagation in good conductors, perfect and Lossy Dielectric.
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UNIT-V Electromagnetic Interference and Compatibility (Theoretical Aspects only):
Introduction to electromagnetic interference and electromagnetic compatibility (EMI & EMC) – sources and characteristics of EMI – control techniques of EMI – Grounding – Shielding – Filtering.

Suggested Books:
1. Hayt W.H., Engineering Electromagnetics, 8th Ed,1994, Tata McGraw Hill.
2. Sadiku, Elements of Electromagnetics, 5thEd, 2000, Oxford University Press.
Reference Books:
1. H.Narayan Rao, Elements of Engineering Electromagnetics, 3rd Edition, 1992, Prentice Hall of India.
2. Electromagnetic waves and Radiating Systems- E.C. Jordan and K.G. Balmain, 2nd Ed., 2000, PHI.
Online resources:
1. MIT OpenCourseWare http://ocw.mit.edu *Electromagnetic Field Theory: A Problem-Solving Approach*
2. http://nptel.ac.in/courses

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
ELECTRICAL CIRCUITS –I

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : PC330EE
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course objective:	Course Outcomes:
The objective of Electrical Circuits is to provide Under Graduate Engineer a thorough understanding of the fundamentals of electric circuits such that the student would develop an in depth knowledge of circuit elements (active and passive), their characteristics and their functioning to analyze and apply to many engineering problems.	1. Apply basic Electrical concepts to analyze electrical circuits. 2. Apply network theorems to analyze Electrical circuits 3. Apply the concepts of resonance to analyze electrical circuits 4. Apply the concepts of Two-port networks to analyze electrical circuits 5. Apply concepts of three phase circuits to analyze them 6. Design simple electrical circuits using simulation and hardware

UNIT-I

Electric Circuit fundamentals: Charge and Current, Voltage, Power and energy, Passive sign convention, Passive circuit elements R, L and C and their V-I relationships, Description of independent and dependent sources, Ohm's law, KCL, KVL.

DC Circuit Analysis Techniques: Series and parallel circuits, Current and voltage division principles, Source transformation, Wye – Delta transformation, Delta-Wye transformation Nodal and mesh analyses containing independent and dependent sources.

UNIT-II

AC Circuit Analysis Techniques:

Definition and computation of average value, RMS value of periodic signals, form factor and peak factor, Definition of phasor, Phasor domain conversions, Steady state response of RLC circuits subjected to sinusoidal excitation, Network analysis techniques in phasor domain, Definition of complex power, Power factor and calculations of power in single phase ac circuits.

UNIT III

Network Theorems:
Linearity, Superposition, Thevenin's, Norton's, Maximum Power Transfer, Tellegen's, Milliman's and Reciprocity Theorem with DC and AC excitation and their applications.

UNIT IV
Resonance:
Definitions and computations of series and parallel resonance, definitions of bandwidth and Q-factor, selectivity.

Locus diagrams:
Admittance and Current locus Diagrams RL and RC series circuits only

UNIT-V
Coupled Circuits:
Self and mutual inductances, coefficient of coupling, Dot convention, Analysis of circuits with mutual inductance.

3-phase circuit analysis:
3-phase power, Wye and Delta Connected systems, Calculations of voltage, current and power in 3- phase circuit, Balanced and unbalanced loads.

Suggested Books:

1. Van Valkenburg, Network Analysis, 3rd Ed, 1992, Prentice Hall of India.
2. W.H.Hayt, J .E.Kimmerly, Engineering Circuit Analysis, 5th Edition, 2000, McGraw- Hill.

Reference Books:

1. Charles K.Alexander & Matthew N.O.Sadiku, Fundamentals of Electric Circuits, 2003, Tata McGraw-Hili,.
2. David A.Bell, Electric Circuits , Seventh Edition,2015Oxford university Press.

Online resources:
1. http://ocw.tufts.edu
2. http://ocw.upm.es
3. http://nptel.ac.in/courses/108106072/

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
ELECTRICAL MACHINES – I

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : PC340EE
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course objective:	Course Outcomes:
To study the principles, performances and applications of electromechanical energy conversion devices like D.C machines and Transformers which are used in many industries	1. Evaluate the stored and converted energy and exerted force in electromechanical energy conversion devices 2. Able to select appropriate D.C Generator to meet the requirements of the application in industry. 3. Able to Test the performance and select appropriate D.C motor to meet the requirements of the application in industry. 4. Able to Test the performance of single phase Transformer. 5. Able to choose a suitable three phase transformer based on its application and also convert three phase to two phase or vice versa.

UNIT –I

Principles of Electro-mechanical Energy Conversion: Energy in magnetic system, Field energy and mechanical force, Direction of mechanical force developed, Flow of energy in electro-mechanical devices, singly excited and multiply excited systems

UNIT –II

DC Machines: Brief description of constructional features – Armature windings – Simple lap and wave windings - Brush position – Classification of DC Machines.

DC Generators: Generated EMF, Methods of excitation, Armature reaction, Theory of commutation, compensating windings, interpoles, Types of generators and their characteristics, parallel operation.

UNIT –III

DC Motors: Generation of electromagnetic torque, Types of motors and their characteristics, Application of motors, Starting and speed control methods of DC motors. Testing of DC Motors, Losses and efficiency,

Swinburne's test, Hopkinson's test, Field test for series motors, Retardation test, Separation of losses.

UNIT –IV

Single Phase Transformers:

Constructional features, Principle of operation, Ideal transformer, Transformer on 'No load' and 'On load', Vector diagram, Equivalent circuit, Polarity test, O.C & S.C tests, Sumpner's test, Regulation & efficiency, All day efficiency, Separation of losses, Parallel Operation, Auto Transformer.

UNIT –V

Three Phase Transformers: Three phase transformers connections Y-Y, Δ- Δ, Δ-Y, Y-Δ, V-V and scott connections, Excitation phenomena of Transformers, Tertiary winding.

Tap Changing Transformers: Concept of tap changing, on-load and off-load tap changers

Suggested Books:

1. Dr. P.S. Bhimbra, Electrical machinery, 7th edition (2011), Khanna Publications, Delhi
2. Dr. P.S. Bhimbra, Generalized Electrical Machines, 5th edition (1991), Khanna Publications, Delhi

Reference Books:

1. H. Cotton, Electrical Technology, 7th edition (2005), CBS publishers, New Delhi
2. Stephen. J. Chapman: Electric Machinery Fundamentals, 4th edition (2005), Mc Graw Hill, Singapore
3. John Hindmarsh, Electric Machines and their Applications, Pergamon Press, London, 1977.
4. Fitzgerald, Kingsley, Umans, Electric Machinery, 6th edition (2002), Tata Mc Graw Hill Publications New Delhi
5. D.P Kothari and I.J Nagrath, Electrical Machines, 1st edition (2006), Tata McGraw Hill Publications, Sigma series, New Delhi
6. J. B Gupta, Theory and performance of electrical machines, 15th edition (2015), S. K. Kataria & Sons publications, New Delhi

Online Resources:

1. http://www.nptelvideos.in/2012/11/electrical-machines-i.html
2. http://ieeexplore.ieee.org/search/searchresult.jsp?queryText=Electrical%20Machinery&newsearch=true

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
ELECTRICAL CIRCUITS LAB

Instruction:2 Hours /week	SEE Marks :50	Course Code : PC321EE
Credits : 1	CIE Marks: 25	Duration of SEE: 3 Hours

Course objective:	Course Outcomes:
To impart the Practical knowledge on Transients in RLC circuits, Frequency response of RLC circuits, Parameters of Two port network, Current locus of RL/RC circuits and circuit theorems.	1. **Design** the RLC circuits on the bread board and **analyse** their responses in Time as well as Frequency domain. 2. **Calculate** the Z, Y, ABCD & h – parameters of a given Network by **applying** suitable mathematical equations using the test readings. 3. **Apply** the concepts of theorems on AC/DC circuits and **analyse**. 4. **Use** software tools PSPICE, MATLAB & PSIM to **simulate** the given electrical circuits and **compare** the simulation results with practical results. 5. Communicate effectively and support constructively towards team work. 6. Pursue lifelong learning for career and professional growth with ethical concern for society and environment

LIST OF EXPERIMENTS

1. Charging, discharging characteristics of RC series circuit.
2. Locus diagram of a RC/RL series circuit.
3. Frequency response of a RLC series circuit.
4. Parameters of Two Port Network.
5. Verification of theorems a) Thevenin's b) Norton's c) Super Position d) Max. Power Transfer.
6. Transient responses of RLC series circuit.
7. Characteristics of linear/Non – linear and Bilateral elements.
8. Series and Parallel resonance – Using software tool.
9. Transient responses of Series RLC, RL and RC circuits with sine & step input – Using PSIM.
10. Verification of Network theorems (i) Thevenin's theorem (ii) Superposition Theorem & (iii) Maximum power transfer theorem – Using software tool.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR BE III SEMESTER
ELECTRONICS ENGINEERING LAB– I

Instruction:2 Hours /week	SEE Marks :50	Course Code : PC321EC
Credits : 1	CIE Marks: 25	Duration of SEE: 3 Hours

Course Objective:	Course Outcomes
To develop an understanding of the characteristics of Electronic devices and circuits with Qualitative approach	At the end of the course students should be able to: • Estimate the parameters from V-I characteristics of different diodes and evaluate the performance of rectifiers. • Estimate the parameters from BJT and FET characteristics. • Compute the bandwidth of RC coupled BJT and FET amplifiers from the frequency response. • Communicate effectively and support constructively towards team work. • Pursue lifelong learning for career and professional growth with ethical concern for society and environment

LIST OF EXPERIMENTS:

1. V-I Characteristics of Si, Ge and Zener diode
2. Zener as Voltage Regulator
3. Design of Half wave and Full wave Rectifiers with and without Filters
4. Common Base characteristics of BJT and measurement of h– parameters
5. Common Emitter characteristics of BJT and measurement of h-parameters,
6. JFET Characteristics and measurement of its small signal parameters.
7. Applications of Cathode ray oscilloscope.
8. BJT biasing.
9. Analysis and bandwidth calculation of Single stage RC coupled CE Amplifier.
10. Analysis and bandwidth calculation of Emitter follower.
11. Single stage FET Common Source RC coupled Amplifier
12. Analysis and bandwidth calculation of Source follower.
13. Analysis and bandwidth calculation of Multi stage RC coupled CE Amplifier.
14. Characteristics of UJT.

Suggested Reading:

1. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text - Lab Manual", 7thEdition 2001, TMH
2. S.Poorna Chandra, B. Sasikala, Electronics Laboratory Primer, A design approach, ,1998, Wheeler publishing.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION
B.E IV-SEMESTER UNDER CBCS W.E.F. 2017-2018

Course Code	IV SEMESTER								Credits
	Course Name	Scheme of Instruction Hours per week				Scheme of Examination			
		L	T	D	P	Duration in Hours	Max. Marks		
							SEE	CIE	
BS410MA	Engineering Mathematics – IV	3	1	0	0	3	70	30	3
MC300EH	HVPE – I (ECE, EEE, IT)	1	0	0	0	2	35	15	1
HS410EH	FS-II: Communication Skills in English-II	2	2	0	0	3	70	30	2
OE4XXXX	Open Elective – II	1	0	0	0	2	35	15	1
OE4XXXX	Open Elective – III	2	0	0	0	3	70	30	2
PC410EC	Electronics Engineering-II	3	1	0	0	3	70	30	3
PC420EE	Electrical circuits-II	3	1	0	0	3	70	30	3
PC430EE	Power System-I	3	1	0	0	3	70	30	3
PC440EE	Electrical Machines-II	3	1	0	0	3	70	30	3
LABS									
PC411EC	Electronics Engineering Lab-II	0	0	0	2	3	50	25	1
PC421EE	Electrical Machines-I Lab	0	0	0	2	3	50	25	1
Total		**21**	**7**	**0**	**4**		**660**	**290**	**23**
		32					**950**		

SEE- Semester End Examination **CIE- Continuous Internal Evaluation**

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
ENGINEERING MATHEMATICS - IV
(For all branches except IT)

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : BS410MA
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	At the end of the course students will be able to:
1. ***Understand*** the Definition of Laplace and inverse Laplace Transforms-Shifting Properties and various theorems and how to apply them in solving Differential Equations. 2. Analyze the characteristics and properties of and Z – transforms and solve the Difference Equations. 3. ***Study*** the concept of Fourier and inverse Fourier Transform of a function and various properties. 4. ***Understand*** the Analytic functions, to evaluate a line integral of a function of a complex variable using Cauchy's integral formula, to evaluate real integrals using complex integration and how to evaluate Laurent Series and residues.	a) ***Evaluate*** Laplace transforms and inverse Laplace transforms of functions. Apply Laplace transforms to solve ordinary differential equations arising in engineering problems. b) Apply Z-transform in the analysis of continuous time and discrete time systems and solve the Difference Equations using Z-transform. c) Determine Fourier transform, Fourier sine and cosine transform of a function. d) Know the condition(s) for a complex variable function to be analytic and/or harmonic and state and prove the Cauchy Riemann Equation and use it to show that a function is analytic and to define singularities of a function, know the different types of singularities, evaluate contour integrals using the Cauchy Integral Theorem and the Cauchy Integral Formula and will be able to determine transformation in a complex space.

UNIT- I (12 classes)

Laplace Transforms: Introduction to Integral Transformation- Laplace transforms - Inverse Laplace transform - Sufficient Condition for Existence of Laplace Transform - Laplace Transform of Derivatives - Laplace Transform of Integrals –Translation theorems-First shifting theorem – Unit step function- Second shifting theorem – Differentiation of Laplace transform – Integration of Laplace transform - Convolution Theorem - Application of Laplace transforms to Initial value problems.

UNIT –II (8 classes)

Fourier Transforms: Fourier Integral Theorem without proof- Fourier Transforms – Inverse Fourier Transform - Properties of Fourier Transform –Fourier Cosine & Sine Transforms – Convolution Theorem.

UNIT-III: (8 classes)

Z-Transforms: Introduction - Z-transforms of Standard sequences - Linearity Property – Scaling Property - Shifting Properties- Initial and Final value theorems – Differentiation of Z-transform - Inverse Z-Transforms- Convolution Theorem – Application of Z-Transforms to solve Difference Equations.

UNIT-IV (15 classes)

Functions of Complex Variables: Limits and Continuity of function - **D**ifferentiability and Analyticity - Necessary & Sufficient Condition for a Function to be Analytic - Cauchy-Riemann Equations in Cartesian & Polar Form - Milne-Thomson's method - Harmonic Functions - Complex Integration - Cauchy's Theorem - Extension of Cauchy's Theorem for multiply connected regions- Cauchy's Integral Formula.

UNIT-V (10 classes)

Power series - Taylor's Series - Laurent's Series (without proofs) - Zeros and Singularities –Residues – Cauchy's Residue Theorem -Evaluation of Real Definite Integrals Involving Trigonometric functions and improper integrals of the form $\int_{-\infty}^{\infty} f(x)\,dx$ using Residue Theorem.

Suggested Books:

1. R.K.Jain & S.R.K.Iyengar, Advanced Engineering Mathematics - 3rd Edition, Narosa Publications
2. Dr.B.S Grewal, Higher Engineering Mathematics, 40th Edition, Khanna Publishers.
3. Goyal & Gupta, Laplace's and Fourier transforms, Pragati prakashan

Reference books:

1. Kreyszig E, Advanced Engineering Mathematics, 8th Edition, John Wiley & Sons Ltd, 2006.
2. H.K. Dass, Er.Rajnish Verma, Higher Engineering Mathematics, 2011 Edition S.Chand & company Ltd.
3. R.V. Churchill, "Operational Mathematics",Mc Graw-Hill Book Company, INC.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
HUMAN VALUES AND PROFESIONAL VALUES-I

Instruction:1Hrs/ Week	SEE Marks: 35	Course Code: MC300EH
Credits: 1	CIE Marks: 15	Duration of SEE: 2Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to	At the end of this course the student will be able to
1. Get a holistic perspective of value- based education. 2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations. 3. Understand professionalism in harmony with self and society. 4. Develop ethical human conduct and professional competence. 5. Enrich their interactions with the world around, both professional and personal.	a. Gain a world view of the self, the society and the profession. b. Make informed decisions. c. Start exploring themselves in relation to others and their work –constantly evolving into better human beings and professionals d. Inculcate Human values into their profession. e. Validate their aspirations through right understanding of human relationship and see the co-relation between the human values and prevailing problems. f. Strike a balance between physical, mental, emotional and spiritual parts their being. g. Obtain a holistic vision about value-based education and professional ethics.

UNIT-I: Human and Ethical values

What are they? --The Indian concept of values-- Modern approach to the study of values - Basis for Moral Judgement--- A new approach to Human Values-- freedom, creativity, love, wisdom, concern.

UNIT-II: Canons of Ethics

Virtue Ethics-- Ethics of Duty-- Ethics of Responsibility-- Factors to be considered in making Ethical Judgments.

UNIT-III: The Value of time

The importance of managing time-- Factors that hinder time management--Benefits of time management-- Using time judiciously-- practical strategies to manage time.

UNIT-IV: The Power of Positive thinking

Nature and Scope of Positive thinking-- Methods to change one's thinking---Strategies to change the cycle of one's thinking.

UNIT-V: The Value of Setting Goals

Goal setting-- Importance of setting goals for oneself—Achieving excellence through SMART goals.

Suggested Books:

- B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
- A.N Tripathy, 2003 Human values, New Age International Publishers.
- EG Seebauer & Robert L. Berry,2000, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
- Mike Martin and Ronald Schinzinger "Ethics in Engineering "McGraw Hill
- Charles E Haris, Micheal J Rabins, " Engineering Ethics "Cengage Learning
- Caroline Whitback, Ethics in Engineering Practice and Research, Cambridgs University Press
- Georgs Reynolds, Ethics in Information Technology", Cengage Learning
- Charles D. Fleddermann, " Engineering Ethics", Pearson Education Prentice Hall, New Jersey,2004 (Indian Reprint)

Online Resoureces:

- Value Education website, Http://www.universalhumanvalues.info
- UPTU webiste, Http://www.uptu.ac.in
- Story of stuff, Http://www.storyofstuff.com
- AlGore, As Inconvenient Truth, Paramount Classics ,USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology-The Untold story-Anand Gandhi, Right Here Right Now, Cyclewala production

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E III SEMESTER
FS-II: COMMUNICATION SKILLS IN ENGLISH-II

Instruction: 2+2Hrs/ Week	SEE Marks: 70	Course Code: MC410EH
Credits: 2	CIE Marks: 30	Duration of SEE: 3 Hrs

Course Objective	Course Outcomes
1. identify the various features and functions of human language and communication. 2. develop the habit of listening effectively so as to analyze the speaker's tone and tenor. 3. choose appropriate words so as to speak and write accurately. 4. read various types of texts and sift information correctly. 5. study organizational structures and behavioral patterns and adapt appropriately.	1. Participate in group and forum discussions by providing factual information, possible solutions, and examples. 2. Debate on a topic by picking up the key points from the arguments placed. 3. Provide logical conclusions to the topics under discussion. 2. Prepare, present, and analyze reports. 3. choose appropriate words and tone to present accurate, specific, and factual reports. 4. Compose a summary of beginning high level reading text that identifies the thesis and key supporting details. 5. Summarize with 70% comprehension.. 6. Apply reading skills, including how to approach different types of literature.

UNIT I: PROFESSIONAL DISCUSSIONS AND DEBATES

Competencies:

- Analytical and Probing Skills
- Interpersonal Skills

Topics Covered:

Discussing
Debating

Topic Level Details

Discussing

Competencies:

- Thinking
- Assimilating

Debating

Competencies:

- Comprehending key points of the debate and note decisive points including supporting details.
- Construct a logical chain of arguments and decisive points.
- Writing a review about a product by providing reasons, causes, and effects

UNIT II: DRAWING CONCLUSIONS

Competencies:

- Reasoning skills - Coherent and logical thinking
- Reporting and Analyzing skills.

Topics Covered:

How to draw conclusions

Importance of Logic

Topic Level Details:

Drawing conclusions

Competencies:

- Analyzing the points discussed.
- Connecting all points without gaps.
- Identifying clinchers.
- Communicating the decisions

UNIT III - REPORTING

Competencies:

- Reporting an incident
- Writing/Presenting a project report

UNIT IV - READING FOR CONTEXT

Competencies

Develop metacognitive strategies

Topics covered

Develop critical reading skills:

- Recognition of author's purpose
- Awareness of stylistic differences
- Discernment of fact and opinion
- Evaluation of fact and opinion
- Recognition of propaganda techniques
- Present vocabulary building methods
- Use comprehension and vocabulary strategies to raise reading rate.

UNIT V- SOFT-SKILLS

1. Professional integrity
2. Managing time
3. Coping with stress
4. Organizational skills

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
ELECTRONICS ENGINEERING–II

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : PC410EC
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course Objective:	Course Outcomes
To familiarize the students with design and working of various amplifiers and oscillators and analyze concepts of linear and non-linear circuits.	At the end of the course students should be able to: • Analyze and design various feedback amplifies and large signal amplifiers. • Design a sinusoidal oscillator. • Analyze drift compensation techniques and differential amplifiers. • Design and analyze linear and non-linear wave shaping circuits.

UNIT – I

Feedback amplifiers: Concept of feedback, feedback amplifier configurations, circuits, Advantages of negative feedback, analysis of simple feedback amplifiers using BJTs and FETs.

UNIT – II

Oscillators: Barkhausen criterion, RC phase shift oscillator, Weinbridge oscillator, LC oscillators: Hartley and Colpitts, Crystal controlled oscillator (analysis of oscillators using only BJTs), Stability of oscillator

UNIT – III

DC amplifiers: Problems of dc amplifiers, Drift compensation techniques, Differential amplifiers, importance of CMRR, High CMRR differential amplifier.

UNIT – IV

Power amplifiers: Classification of Power amplifiers, analysis of class A and class B power amplifiers, Distortion in amplifiers, push pull amplifiers, complementary symmetry power amplifiers

UNIT – V

Wave shaping circuits: RC low pass and high pass circuits: response to step, pulse, ramp and square inputs, Differentiating and integrating circuits, Clipping circuits for single level and two level using diode, Clamping circuits.

Suggested Books:

1. Jacob Millman, Christos C.Halkias, and Chetan Parikh, "Integrated Electronics", 2nd Edition, 2009,McGraw Hill Publication.
2. Jacob Millman, Christos C.Halkias and Satyabrata Jit,Electronic Devices and Circuits, 3/e,2010,McGraw Hill.

Reference Books:

1. Jacob Millman & Herbert Taub, Pulse, Digital and switching waveforms, 3/e, 2011, TMH.
2. Robert L. Boylestad, "Electronic Devices and Circuit Theory", 6th Edition,1998, PHI.
3. Donald Schilling, Charles Belove, TuviaApelewicz Raymond Saccardi, "Electronic Circuits: Discrete and Integrated",3rd Edition, TMH.
4. Roody and Coolen, "Electronic Communications", 4th Edition, Reprint 2007, Pearson Education.

Online resources:

1. http://nptel.ac.in/courses/

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
ELECTRICAL CIRCUITS - II

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : PC420EE
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course objective:	Course Outcomes:
1. To analyze the electrical circuits transients using classical and Laplace Transform methods 2. To analyze the Fourier Series applications to Electrical circuits 3. To synthesise the networks in Foster's and Cauer's forms 4. To analyze the networks using Network Topology	By the end of the course, students should be able to 1. Analyze the electrical circuits transients for step, impulse and sinusoidal inputs using classical method. 2. Evaluate Laplace Transforms of time domain functions- impulse, unit step, ramp, sinusoidal and exponential functions. 3. Apply mathematical techniques to systems for analysis using Laplace-Transforms and Fourier series. 4. Apply concepts of electrical network topology to analyze Electrical circuits. 5. Analyze and synthesize the various network functions using Foster's and Cauer's forms 6. Design simple electrical circuits using simulation and hardware

Unit I : **Transient Response**:

Initial and final (Steady - State) conditions in circuit elements (R,L,C), Zero-input response of RC, RL and RLC networks. Definitions of unit impulse, unit step and ramp functions. Zero State Response with impulse and step inputs. Complete response of circuits with initial conditions and forcing functions such as step, exponential and Sinusoidal functions.

Unit II: Development of Laplace Transform Method:

Laplace Transform pair, Evaluation of Laplace Transforms of common time functions in particular impulse, Unit step, Ramp, sinusoids and exponential functions, Building of Laplace Transform tables, Laplace transform theorems relating time shifting, Differentiation, Integration and Convolution of time functions, Initial and final value theorems, Waveform synthesis, Partial fraction expansion method of obtaining inverse Laplace transforms.

Unit III : **Application of Laplace Transform for circuit analysis:**
Transient phenomena with Laplace transforms, circuit analysis in the S (Complex variable) domain, Concept of transfer function, Pole-Zero plots.

Unit IV: Network Topology:
Network Graph concept, Oriented graph, Node, Branch, complete incidence matrix, basic incidence matrix, loop, tie-set, tree and its properties, co-tree, Fundamental tie-set matrix, cut-set, Fundamental cut-set matrix, Duality.

Fourier series:
Fourier series representation of periodic functions using both trigonometric and exponential functions. Amplitude and Phase spectrums, application to 34lectrical circuits. Symmetry conditions,

Unit V: **Two port parameters**:
Z, Y, ABCD and h-parameters, their interrelationships, series, parallel and cascade connection of two ports.

Suggested Books:

1. Van Valkenburg M.R., *Network Analysis,* 3rd Edition, 1995, Prentice Hall of India.
2. Hayt W.H., Kimmerly J.E., *Engineering Circuit Analysis,* 6th Edition, 2002, Mc Graw Hill.

Reference Books:

1. N.C. Jagan & C. Lakshminarayana, *Network Analysis and Synthesis,* 2004, B.S. Publications.
1. 2.Charles K.Aleximder &Matthew N.O.Sadiku, Fundamental of Electric Circuits, 2003, TataMC Graw-Hill,.
2. 3.Gopal G Bhise, Prem R Chadha & Durgesh, C. Kulshreshtha, Engineering Network Analysis & Filter Design, Umesh Publications.

Online resources:
1. http://ocw.tufts.edu
2. http://ocw.upm.es
3. http://nptel.ac.in/courses/

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
POWER SYSTEMS – I

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : PC430EE
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course objective:	Course Outcomes:
1. Have a fair knowledge about the fundamentals of various conventional power plants like Thermal, Hydel, Nuclear and Gas. 2. Acquire the knowledge of different types of Non-conventional energy generation methods like Solar, Wind, Ocean Thermal Energy Conversion (OTEC), Tidal and Geo thermal. 3. Understand the Economics of Power Generation, Types of costs, Depreciation, methods of P.f. improvement, Tariffs 4. Have the knowledge of construction of Overhead lines, materials, Supports, insulators and Underground cables. 5. General aspects of AC & DC distribution systems.	1. **Identify** and **select** the proper type of Power Plant for the Power Generation. 2. **Estimate** the Energy generated by different Nonconventional Generating stations. 3. **Assess** the P.f. improvement methods, Tariffs 4. **Test** and **categorize** the insulators and **calculate** the Sag & Tension in Over head lines. 5. **Differentiate** AC & DC distribution systems

UNIT – I

Thermal, Hydel, Nuclear Power Generation Principles, Choice of site, layout and various parts of generating stations.

Estimation of power in Hydel, flow duration curve, hydrograph, mass curve etc. Types of Hydel stations. Nuclear Stations, PWR, BWR, FBR. GAS Turbines, GAS power stations, Combined cycle power stations. MAJOR DISASTERS around the world in power plants-lessons learnt.

UNIT – II

Non-Conventional energy generation methods: Solar, Wind, Ocean Thermal Energy Conversion (OTEC), Tidal, Geo Thermal.

Solar cells, Efficiency, Solar collectors, Concentrators. Wind generators, Wind turbine types, rotors construction, Hybrid power generation.

UNIT – III

Economics of Power Generation: Load Curve, load demand and diversity factors, base load and peak load operation, types of costs and depreciation fund calculations. Methods of power factor improvement, economics of p.f. improvements, tariffs.

UNIT- IV

Construction of Overhead lines - Overhead line materials – Supports – types, Vibration Dampers, Arcing Horns, Sag / Tension calculations, Equal / Unequal supports, Effects of Wind, ICE / Erection Conditions Stringing Charts

Insulators -Types –Material for construction – potential distribution over string of insulators, Equalizing of potential-Methods, Insulators testing.

Underground cables –Insulating Materials, Mechanical Protection, EHV / HV / LV cables, grading of cables, capacitance of 3 core cables.

UNIT – V

General aspects of AC and DC distribution systems - DC Systems, ring main, Radial, Voltage drop calculations, Distributor fed at one end, Distributor fed at both ends.

Suggested Books:

1. Wadhwa C.L., Electrical Power Systems, 5th Ed, 2005, Wiley Eastern Ltd.
2. Wadhwa C.L., Generation, Distribution and Utilisation of Electrical Energy, 5th Ed, 2005, Wiley Eastern Ltd.,

Reference Books :

1. Singh S.N., Electrical Power Generation, Transmission and Distribution, New-2003, Prentice Hall PVt. Ltd.

Online resources:

2. http://nptel.ac.in/courses/
3. http://ocw.tufts.edu
4. http://ocw.upm.es
5. www.open.edu/openlearn/

With effect from the Academic Year 2017-18

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
ELECTRICAL MACHINERY – II

Instruction:3+1 Hours /week	SEE Marks :70	Course Code : PC440EE
Credits : 3	CIE Marks: 30	Duration of SEE : 3 Hours

Course Objective:	**Course Outcomes:**
The aim of this course is: 1. To explain the principle of operation of three phase induction motor and their operating characteristics and analyze the performance with the equivalent circuit parameters. 2. To contrast different methods of speed control of three phase induction motor and analyze their slip-torque characteristics. 3. To describe an overview of constructional details and contrast different methods of finding voltage regulation of synchronous generator. 4. To explain the principle of operation of synchronous motor, starting methods and analyze their performance characteristics.	The student will be able to: 1. Demonstrate basic concepts of AC machines. 2. Evaluate performance characteristics of induction machine and synchronous machines 3. Analyze the operating characteristics of induction and synchronous machines. 4. Calculate voltage regulation of salient and Non-salient pole synchronous generator. 5. Analyze speed torque characteristics and control the speed of induction motors

UNIT-I:

Three-phase Induction Motor: Constructional features, Rotating Magnetic Field, Principle of operation of squirrel cage and slip ring motors, Phasor diagram, Power Flow diagram, Equivalent circuit, Expression for torque, Slip/Torque characteristics, Starting torque, Maximum torque, Performance characteristics.

UNIT-II:

Testing - No load and Blocked rotor test, Current loci circle diagram, Starting methods of squirrel cage and wound rotor induction motor, Modes of operation, Speed control methods – Resistance control, Voltage control, Variable frequency control, Deep bar and Double cage Induction motors, Induction generator.

UNIT-III:

Synchronous Machines: Constructional details, Types of windings, Winding factors, Generated e.m.f., Fractional pitch and fractional slot windings, Suppression of harmonics and tooth ripple, Armature reaction and reactance, Synchronous impedance.

Synchronous Generator: Circuit model, Phasor diagram, Voltage regulation - O.C. and S.C. characteristics , Synchronous impedance, Ampere turn, ZPF methods for finding voltage regulation , Principle of two reaction theory and its application for the salient pole synchronous machine analysis – Synchronizing and parallel operation.

UNIT-IV:

Synchronous Motor: Theory of operation, Circuit model, Phasor diagram, Methods of starting, Power equation, Maximum power, Variation of current and p.f. with excitation, Hunting and its prevention, Power angle characteristics, Slip test, Synchronizing power coefficient and Synchronizing power, Synchronous condenser.

UNIT-V:

Single phase induction motor: Constructional features, Double revolving field theory, Equivalent circuit, Split phase starting methods & Applications.

Suggested Books:

1. Nagarath I.J., Kothari D.P., Electrical Machines. 4th Edition 2010, Tata McGraw Hill.
2. Gupta J.B., Theory and Performance of Electrical Machines, 2003, S.K. Kataria. & Sons,.

Reference Books:

1. Bhimbra P.S., Generalized Theory of Electrical Machines, Khanna Publications
2. Dr.P.S Bimbhra, Electrical Machinery,7th Edition, Khanna Publishers
3. M.G. Say, The Performance and Design of A.C. Machines – Pitman Publications.

Online resources:

1. http://nptel.ac.in/courses/108106072/
2. http://nptel.ac.in/courses/108108076/
3. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-685-electric-machines-fall-2013/

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
ELECTRONICS ENGINEERING – II LAB

Instruction:2 Hours /week	SEE Marks :50	Course Code : PC411EC
Credits : 1	CIE Marks: 25	Duration of SEE : 3 Hours

Course Objective:	Course Outcomes
To develop an understanding of the underlying concepts of analog electronic circuits including feedback amplifiers, power amplifiers & oscillators, and design linear wave shaping and non-linear wave shaping circuits.	At the end of the course students should be able to: • Analyze the small signal amplifiers behavior with and without feedback • Design and verify the functioning of various sinusoidal oscillators • Examine the characteristics of a difference amplifier • Design different types of clippers and clampers • Communicate effectively and support constructively towards team work. • Pursue lifelong learning for career and professional growth with ethical concern for society and environment

List of Experiments:

1. Frequency response of Voltage series feedback amplifier
2. Frequency response of Voltage Shunt feedback amplifier
3. Frequency response of Current series feedback amplifier
4. Frequency response of Current Shunt feedback amplifier
5. Design of Hartley Oscillator
6. Design of Colpitt's Oscillator
7. Design of RC Phase Shift
8. Difference amplifier(Op-Amp)
9. Transformer coupled Class A power amplifier
10. Class B Power amplifier
11. Linear wave shaping-Integrator & Differentiator
12. Clipping circuits
13. Clamping Circuits

Suggested Reading:

2. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text - Lab Manual", 7th Ed, TMH 2001.
3. Paul B. Zbar, Industrial Electronics, A Text-Lab Manual, 3rd Ed, TMH 1983.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
SYLLABUS FOR B.E IV SEMESTER
ELECTRICAL MACHINES LAB - I

Instruction:2 Hours /week	SEE Marks :50	Course Code : PC421EE
Credits : 1	CIE Marks: 25	Duration of SEE : 3 Hours

Course objective:	**Course Outcomes:**
To expose the students to practical experiments of DC machines and single phase transformers.	1. Able to test the performance of various DC generators. 2. Able to test the performance of various DC motors. 3. Able to test the performance of single phase transformers. 4. Communicate effectively and support constructively towards team work. 5. Pursue lifelong learning for career and professional growth with ethical concern for society and environment

List of Experiments:

1. Magnetization characteristics and the speed Vs voltage curve of separately and self excited D.C. generator
2. Load characteristics of D.C Shunt Generators
3. Load characteristics of D.C Compound generator
4. Performance characteristics of D.C Series Motor
5. Performance characteristics of D.C. shunt motor
6. Performance characteristics of D.C Compound motor
7. Separation of iron and friction losses and estimation of parameters in D.C. machines.
8. (a)Speed control of D.C. shunt motor by shunt field control and armature resistance control (b) Swinburne's Test
9. Separation of core losses in a Single Phase transformer
10. Open circuit and short circuit tests on a Single Phase transformer
11. Sumpner's test on two identical transformers
12. Estimation of efficiency of DC Machine by Hopkinson test.
13. Retardation Test , Dynamic Braking of DC Shunt Motors.