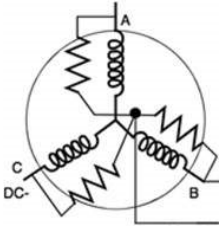
VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
Ibrahimbagh, Hyderabad-31

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

Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad

STUDENT HAND BOOK
Academic Regulations (Autonomous) and Syllabi of SECOND YEAR B.E (EEE) w.e.f 2016–17



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
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DEPARTMENT VISION

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

DEPARTMENT MISSION

To impart in depth knowledge to students, so that they acquire the skills to innovate, excel and lead in their professions with values and ethics that will benefit society.

Program Educational Objectives (PEO's)

- **PEO 1**: Electrical Engineering Graduates will acquire technical competence to analyze, design and solve engineering problems in the field of electrical engineering and use modern engineering tools, techniques and software.
- **PEO 2**: Graduates will be able to acquire necessary skills and obtain employment and will be productive in the professional practice of Electrical Engineering and related fields.
- **PEO 3**: Graduates will be sensitive to professional and social contexts, committed to ethical action and engaged in lifelong learning skills demonstrated by higher education / higher degrees and professional development activities.

ABOUT THE COLLEGE

VISION

Striving for a symbiosis of technological excellence and human values

Established in 1981 by Vasavi Academy of Education under the stewardship of Late Sri Pendekanti Venkata Subbaiah, a veteran statesman of independent India and by a few eminent people from different walks of life Vasavi College of Engineering represents a rich tradition of excellence in technology based education in a stimulating environment. From a modest beginning with just three undergraduate programs, viz., B.E. degree programs in Civil, Mechanical and Electronics & Communication Engineering, with dedicated efforts for over **33** years, it has now grown into a mighty center of learning with excellent and well-developed infrastructural facilities, offering 6 undergraduate programs, viz., B.E. in Civil, Mechanical, Electrical & Electronics, Electronics & Communication Engineering, Computer Science & Engineering, and Information Technology, in addition to a 3-year postgraduate program in Computer Applications (MCA), and 2-Year Postgraduate Programmes in CSE, ECE, EEE and Mechanical Engineering.

MISSION

To arm the young brains with competitive technology and nurture the holistic development of the individuals for a better tomorrow.

All the undergraduate (B.E) programs were accredited by National Board of Accreditation (NBA) for the academic years 2013-2015. The college sought fresh approval for NBA accreditation for two eligible PG programs and MCA program. The college has been recognized under 12(B) and 2(f) sections of the University Grants Commission (UGC).

The college has been granted ***autonomy by the University Grants Commission***, New Delhi and Osmania University, Hyderabad for all the programs it offers for a period of six years with effect from 2014-15.

The College has 185 highly qualified and experienced faculty members consisting of Professors, Associate Professors and Assistant Professors and around **158** technical and supporting staff. The college has very good infrastructural facilities which go beyond the curriculum requirements. The college offers value-added courses in GIS, CAD/CAM, DSP, VLSI, Networking, J2EE and communication skills to bridge the gap between the curriculum and the requirements of the Industry. Finishing school has been made part of curriculum from the second year onwards to improve the skills of the students.

QUALITY POLICY

Education without quality is like a flower without fragrance. It is our earnest resolve to strive towards high standards of teaching, training and developing human resources.

A Research & Development (R&D) Cell is established by personnel from industry / research organization to encourage the faculty and the students in acquiring additional qualifications and knowledge. This Cell also facilitates the faculty for interaction with industry/research organizations in getting sponsored research projects. In addition, the college extends consultancy in various fields of engineering and technology. The Center for Counseling and Placement at Vasavi College of Engineering provides personal and career-related support to its students. The educational experience at the college is enlivened and enriched by an array of extra-curricular activities to fulfill the cultural and emotional needs of students.

A good number of ranks in university examinations are secured by our students every year. The all-round development of a student is achieved by exposing him/her to the outside world in a systematic and well planned manner. Just not marks and ranks, but also ethics and morals are incorporated into psyche of a student at Vasavi in a cautious way. This unification of tradition and technology makes Vasavi a place for paradise of learning.

ACADEMIC RULES AND REGULATIONS
FOR FOUR YEAR B.E DEGREE COURSE
w.e.f 2016-17 Academic Year

1. RULES OF PROMOTION

ATTENDANCE: The ***minimum aggregate attendance*** percentage for BE program ***is 75%***. On medical grounds 65% attendance with valid medical certificate will be considered. A candidate who did not meet above attendance requirements is not eligible to appear for the semester examinations.

A student is allowed to use medical condonation facility only 4 (four) times in the entire period of 8 semesters in the span of 4 years B.E program.

2. ASSESSMENT AND EVALUATION SYSTEM:

There will be continuous and comprehensive evaluation of students. The distribution of sessional (internal) and semester examination marks for ***B.E program*** are given below:

SESSIONALS EXAMS (internals)
Theory: **30 Marks**

- **20** Marks each for two internal examinations in a semester and 10 marks for assignments and quizzes etc together.
- **Average of two tests** will be considered for calculating internal exams marks to which assignment/quiz marks will be added for obtaining total CIE marks.
- Every student should secure a **minimum of 40% aggregate marks in the internal exams.**

Lab: 25 Marks

15 marks for day-to-day laboratory class work which will be awarded based on the average of all experiments.
- 10 marks for the internal examination.

SEMESTER EXAMS

- Semester theory examinations will be conducted for 70 marks. A student should secure a minimum of 40% marks in each subject for a pass.
- Semester laboratory examinations will be conducted for 50 marks. A student should secure a minimum of 50% marks for a pass.

In addition, a student shall secure a minimum of 40% marks in a theory subject and 50% marks in lab from sessional exams and semester examinations put together for a pass.

3. PROMOTION RULES TO NEXT HIGHER CLASS

S No	Semester / Class	Conditions to be fulfilled for
1	From 1/4 BE, I-SEM to 1/4 BE, II-SEM	Regular course of study of 1/4 B.E, I-SEM and 40% aggregate sessional marks in I-SEM
2	From 1/4 BE, II-SEM to 2/4 BE, I SEM	(a) Regular course of study of 1/4 B.E-II SEM and (b) Must have secured at least 50% of total credits prescribed for 1/4 B.E.
3	From 2/4 BE, I-SEM to 2/4 BE, II-SEM	Regular course of study of 2/4 BE, I-SEM and 40% aggregate sessional marks in II- SEM
4	From 2/4 BE, II-SEM to 3/4 BE, I SEM	(a) Regular course of study of 2/4 BE II SEM (b) Must have secured at least 50% of total credits prescribed for 2/4B. E and passed in all the subjects 1/4 B.E.
5	From 3/4 BE, I-SEM to 3/4 BE, II-SEM	Regular course of study of 3/4 B.E, I-SEM, and 40% aggregate sessional marks in I- SEM
6	From 3/4 BE, II-SEM to 4/4 BE, I SEM	(a) Regular course of study of 3/4 B.E, II-SEM (b) Must have secured at least 50% of total credits prescribed for 3/4 B.E and passed in all the subjects 2/4 B.E.
7	From 4/4 BE, I-SEM to 4/4 BE, II-SEM	(a) Regular course of study of 4/4 B.E, I-SEM and 40% aggregate sessional marks in II-SEM

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
B.E. II YEAR - I-SEMESTER

S No.	Code	Subject	Scheme of Instruction				Scheme of Examination			Credits
			Periods per week				Duration in Hrs	Maximum Marks		
			L	T	D	P		SEM Exam	Sessionals	
1	EE 2010	Electrical Circuits-I	4	1	-	-	3	70	30	3
2	EE2020	Electrical Measurements &Instruments	4	1	-	-	3	70	30	3
3	EE2030	Electromagnetic Theory	4	1	-	-	3	70	30	3
4	MA2020	Partial Differential Equations &Numerical Methods	4	-	-	-	3	70	30	3
5	ME2070	Principles of Mechanical Engineering	4	-	-	-	3	70	30	3
6	EC2140	Electronics Engineering-I	3	1	-	-	3	70	30	3
7	HS2170	Finishing School: Communication Skills in English -I	4	-	-	-	3	70	30	2
		PRACTICALS								
8	EE2031	Circuits and Measurements Lab	-	-	-	3	3	50	25	2
9	EC2401	Electronics Engineering-I Lab	-	-	-	3	3	50	25	2
		Total	**27**	**3**	**-**	**6**		**590**	**260**	**24**
		Grand Total	**36**				**-**	**850**		

INTERDISCIPLINARY COURSES OFFERED BY EEE TO ECE										
PRACTICALS										
1	EE 2041	Basic Electrical Engineering Lab (For ECE)	-	-	-	3	3	50	25	2

With effect from the A.Y 2016-17

VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL AND ELCTRONICS ENGINEERING

SYLLABUS FOR BE 2/4 - FIRST SEMESTER

ELECTRICAL CIRCUITS –I

Instruction 4+1 Periods per week	Sem Exam Marks : 70	Subject Ref Code	: EE2010
Credits : 3	Sessional Marks : 30	Duration of Sem Exam	: 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 many engineering problems.	1. Explain basic electrical concepts, including electric charge, current, electrical Potential, electrical power, and energy and the relationship of voltage and current in resistors, capacitors, inductors, and mutual inductors and apply Kirchhoff's voltage and current laws to the analysis of electric circuits and use different circuit analysis techniques. 2. Apply theorems to analyze the AC/DC circuits that include passive devices, dependent sources, and independent sources in combination. 3. Apply concepts of electric network topology: nodes, branches, and loops to solve circuit. 4. Explain AC steady-state circuit concepts (impedance, reactance, etc) and perform AC steady state analysis in Phasor and frequency domain and able to systematically obtain the equations that characterise the performance of an electric circuit as well as solving both single phase and three-phase circuits in sinusoidal steady state.` 5. Illustrate the phenomenon of series resonance and parallel resonance and formulate the resonant conditions and calculate the Z, Y , ABCD, h parameters of the given network and outline the relation between various two port parameters.

UNIT-I

Definitions of Electric Circuit Parameters, Voltage, Current and Power, Passive sign convention, Passive circuit elements R, Land C and their V-I relationship & symbols, Description of independent and dependent sources, Ohm's law, KCL, KVL. Current and voltage division principles DC Circuit Analysis Techniques, Simple series and parallel circuit analysis and

reduction techniques, Circuit analysis using Source Transformation, Nodal, loop and mesh circuit analysis containing independent and dependent sources.

UNIT-II

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

UNIT III

Network Theorems: Superposition Theorem, Thevenin's, Norton's, Maximum Power Transfer, Tellegen's Theorem, Milliman's Theorem 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 (RL and RC series circuits only). Coupled circuits: Dot convention, Analysis of circuits with mutual inductance, Linear Transformers and ideal transformers

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.

UNIT-V

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

3-phase circuit analysis: 3-phase power, Y and Δ Connected systems, Calculations of voltages, current and power in 3- phase circuits with Y and Δ connected loads and generator, Star – Delta transformation. Balanced and unbalanced loads. Measurements of 3-phase power by two wattmeter method.

Suggested Reading:

1. Van Valkenburg , Network Analysis , Prentice Hall of India, 3rd Edition, 1992
2. W.H.Hayt, J .E.Kimmerly, Engineering Circuit Analysis, McGraw Hill, 5th Ed, 2000
3. Charles K.Alexander & Matthew N.O.Sadiku, Fundamentals OJ Electric Circuits, Tata McGraw-Hili, 2003.
4. David A.Bell, Electric Circuits ,Oxford university Press, Seventh Edition,2015

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER

ELECTRICAL MEASUREMENTS AND INSTRUMENTS

Instruction: 4 +1 Periods/week	Sem Exam Marks : 70	Subject Ref Code: EE2010	
Credits : 3	Sessional Marks : 30	Duration of Sem Exam: 3 Hours	

Course objective:	Course Outcomes:
1. Have a fair knowledge about the fundamentals of construction & working principles of different types of Analog Ammeters, Voltmeters and Watt meters. 2. Acquire the knowledge of different types of energy meters, power factor meters and frequency meters. 3. Understand the knowledge of measurements of circuit elements R,L & C using bridges. 4. Learn the fundamentals of magnetic measurements of B, B-H curve & Iron loss. Understand the construction, working principle and applications of DC and AC potentiometers and CTs and PTs. 5. Understand the construction, working principle and applications of DC and AC potentiometers and CTs and PTs.	1. Able to **identify** and **choose** the proper type and range of meter to measure current / voltage / Power. 2. Able to **measure** and **calculate** the Energy in a 1-ph/3-ph system of balanced/unbalanced. 3. Student can **calculate** the R, L & C values using the proper bridges. 4. Able to **test** the bar specimen/ring specimen and **calculate** the Flux density (B) / Iron loss. 5. Student can **calibrate** ammeter/ voltmeter/ wattmeter using the Potentiometer

UNIT -I

Principles of Measurement and Instrumentation: Objectives of measurements, analog versus digital measurements, accuracy, precision and uncertainty, sources of measurement error. Standard cell and standard resistance. Basic characteristics of measuring instruments with a moving element.

Instruments: Ammeter, Voltmeter. Expression for torque of moving coil, moving iron, dynamometer and electrostatic instruments. Extension of range of instruments wattmeter, torque expression for dynamometer instruments. Reactive power measurement.

UNIT -II

Induction type instruments, Energy meters, single phase and poly phase, Driving torque and braking torque equations. Errors and testing compensation, maximum demand indicator, power factor meters, frequency meters, electrical resonance and Weston type of synchoroscope.

UNIT -III

Bridge methods: measurement of inductance, capacitance and resistance using Bridge.

Maxwell's Anderson, Wein, Heaveside Cambell's Desauty's, Schering's bridges, Kelvin's doublebridge, price guard wire bridge, loss of charge method, megger, wagners Earthing device.

UNIT -IV

Magnetic measurements: Ballistic Galvanometer, calibration by Hibbert's magnetic standard flux meter, Lloyd-fischer square for measuring iron measuring iron loss testing of ring and bar specimens. Determination of B-H curve and hysteresis loop using CRO, Determination of leakage factor.

UNIT -V

Potentiometers and Instrument Transformers: Crompton's DC and AC polar and coordinate type. Applications, Measurement of impedance. Calibration of ammeter, voltmeter and wattmeter. Use of Oscilloscope in frequency, phase and amplitude measurements. Instrument transformers-Ratio and phase angle errors.

Suggested Reading:

1. A.K. Sawhney, A course in Electrical and Electronics Measurements and Instruments- Dhanpat RAi and Sons, Delhi, 2005
2. Umesh Sinha, Electrical and Electronics Measurements and Instruments, Satya Prakashan
3. F.W.Golding and Widdis, Electrical and Electronics Measurements and Instruments 5th Edition-2010

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR BE 2/4 - FIRST SEMESTER

ELECTROMAGNETIC THEORY

Instruction:	4 +1 Periods/ week	Sem Exam Marks	: 70	Subject Ref Code	: EE2030
Credits	: 3	Sessional Marks	: 30	Duration of Sem Exam	: 3 Hours

Course objective:	Course Outcomes:
To impart the basic knowledge of the electromagnetic fields to enable the student to analyze and design various engineering applications involving electromagnetic fields.	Upon completion of this course the students will be able to 1. State and apply the principles of Coulombs Law and Gauss's law to electric fields in the Cartesian, cylindrical and spherical coordinate systems to determine the electric field intensity resulting from various configurations of charge distributions. 2. Classify magnetic materials, and solve magneto static field problems using Biot-Savart law and Ampere's circuit law with the associated boundary conditions. 3. Determine self and mutual inductance of simple practical current carrying systems and calculate force and torque in magnetic fields. 4. Solve electrostatic boundary-value problems by applying of Poisson's and Laplace's equations and determine capacitance of various geometries representing practical system of conductors. 5. Interpret Maxwell's equations for time-varying electromagnetic fields and deduce equations to describe wave propagation, to relate wave velocity and time delay and identify the reasons and methods of reducing electromagnetic compatibility.

UNIT-I

Electrostatic Fields: Brief review of vector analysis – Introduction to different Coordinate systems – Coulomb's law (point charges and charge distribution) Electric field and flux density – Gauss law – Gauss divergence theorem – potential energy and electrical potential – relationship between E and V – integral and point form of Maxwell's Electrostatic equation.

UNIT-II

Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field – Behaviour of conductors in an electric field – Conductors and Insulators. Electric field inside a dielectric

material – polarization – Dielectric –, Capacitance – Capacitance of parallel plate and spherical and coaxial capacitors with composite dielectrics – Energy stored and energy density in a static—Conductor and Dielectric – Dielectric boundary conditions electric field. Poisson's and Laplace equations –Uniqueness theorem, Analytical solutions – By direct integration (One dimensional)

UNIT -III

Magneto static fields: Current density – conduction and Convection current densities – Equation of continuity. Ohm's law in point form determination of magnetic fields using Biot-Savart's law and Amperes law-Magnetic scalar and vector potentials- magnetic materials – forces in magnetic fields – Lorentz's 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 wave propagation: Faraday's law of induction – equation of continuity – displacement current – final forms of Maxwell's equations – power and poynting theorem – time – harmonic electromagnetic fields – wave equations (one dimension) – plan wave propagation in perfect and Lossy Dielectric.

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 Reading:

1. W.H.Hayt, Engineering Electromagnetics, Tata McGraw Hill, 8th Edition,1994.
2. Sadiku, Elements of Electromagnetics, 5th Edition, Oxford University Press,2000
3. H.Narayan Rao, Elements of Engineering Electromagnetics, Prentice Hall of India, 3rd Ed 1992
4. MIT OpenCourseWare http://ocw.mit.edu *Electromagnetic Field Theory: A Problem Solving Approach*

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR BE 2/4 - FIRST SEMESTER

PARTIAL DIFFERENTIAL EQUATIONS –NUMERICAL METHODS

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : MA 2020
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs

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 Analyze the characteristics and properties of and Z – transforms and solve the Difference Equations.	a) ***Find t***he Partial differential equations by eliminating arbitrary constants and functions and solve linear, non linear 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 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) Apply Z-transform in the analysis of continuous time and discrete time systems and also solve the Difference Equations using Z-transform.

Unit – I

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

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

Unit – III

Applications of Partial Differential Equations: Classification of Partial Differential Equations of second order **-** 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

Numerical Methods: Solutions of Algebraic and transcendental Equations- Bisection method- Regula-Falsi method-Newton's-Raphson's method- – Interpolation - Newton's Forward and Backward difference Interpolation formulas- Lagrange's Interpolation - Newton's divided difference interpolation - Numerical differentiation - Solution of Differential equations by Euler's method-Modified Euler's method and Runge – Kutta Method of 4th order (without proofs).

Unit – V

Z- Transforms: Introduction - Basic Theory of Z – Transforms - Z – Transform of some standard sequences - Existence of Z – Transform - Linearity property - Translation Theorem - Scaling property- Initial and Final Value Theorems - Differentiation of Z – Transform - Convolution Theorem - Solution of Difference equations using Z – Transforms.

Suggested Reading:

1. E. Kreyszig. Advanced Engineering Mathematics – Wiley Eastern Ltd., 8th Edition, New Delhi, 2006.
2. R.K. Jain & S.R.K. Iyengar**,** Advanced Engineering Mathematics – Narosa Pub.2005.
3. B.V. Ramana, Higher Engineering Mathematics, Core Engineering Series, Tata Mc Graw – Hill publishing Company Ltd., New Delhi, 2007.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publications, 34th Edition, 1998.
5. B.S.Grewal, Numerical methods, ,Khanna Publishers.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR BE 2/4 - FIRST SEMESTER

PRINCIPLES OF MECHANICAL ENGINEERING

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : ME 2070
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3Hrs.

Course Objectives	Course Outcomes
The course will enable the students to: • learn the basic principles of mechanical engineering in the areas of Heat transfer, Refrigeration; IC Engines; Gears, Ropes and Belt drives; Hydraulic turbines and pumps	At the end of the course students should be able to: • compute the problems in heat transfer and refrigeration • evaluate the performance of on I.C. Engines, air compressors and analyze the working of Boilers and gas turbines • compute the power transmission, velocity ratio in belt &rope drives and gear trains. • calculate coefficient of discharge in flow meters and evaluate the performance of hydraulic turbines • analyze the problems in centrifugal pumps and reciprocating pumps

UNIT-I

Heat Transfer: Modes of Heat transfer – conduction, convection and radiation – steady state conduction – Heat transfer through plane walls, cylinders, critical radius of insulation for cylinders, concept of black body radiation.

Heat Exchanger: Classification, Industry applications, LMTD calculations for parallel and counter flows.

Refrigeration System: Coefficient of performance, ton of refrigeration, air refrigeration system using Bell Colemn Cycle, simple vapour compression refrigeration system (dry saturated at the beginning of the compression) T-S and P-H diagrams, refrigerants and their properties, working principle of window and split air conditioning systems.

UNIT-II

IC Engines: Working of four–stroke and two–stroke petrol and diesel engines with P–v diagrams, calculation of indicated power, brake power, specific fuel consumption, mechanical and thermal efficiencies.

Reciprocating air compressors: Uses of compressed air, principle of working and work done of single stage compressor–Without and with clearance, multistage compressors, advantages, intercoolers and after cooler.

Generation of Steam: Classification of boilers, Fire tube boilers– Locomotive boilers, Cochran boiler, Water tube boiler–Babcock & Wilcox boiler.

Gas Turbines: Classification, calculation of efficiency of simple open gas turbine cycle (Joule cycle/Brayton cycle) and applications

UNIT-III

Gears: Classification, Gear trains, types – Single, compound, Inverted & Epi cyclic gear trains, Belt & rope drives, open and cross belt, length of belt, ratio of tension flat belts, condition for maximum power.

UNIT-IV

Introduction to Bernoulli's equation, applications – Venturi meter, Orifice meter, Flow through pipes – Hagen's formula, Friction loss in pipes, Darcy's formula, Reynolds number and its significance.

Hydraulic Turbines: Classification – working principle – Francis, Kaplan, Pelton Wheels, work done, power output, efficiency, specific speed, unit quantities, draft tube, performance characteristic curves.

UNIT-V

Pumps: Working principles and construction details of centrifugal and reciprocating pumps, Effect of friction, acceleration head, work done, power required with and without air vessels, cavitation, velocity triangles of centrifugal pumps.

Suggested Reading:

1. PL Ballaney, Thermal Engineering, Khanna Publishers, New Delhi 2010.
2. VB Bandari, Machine Design, Tata McGraw Hill, 2010
3. R.K. Rajput, Thermal Engineering, Laxmi Publications, 2005
4. S. Ramamrutham, Hydraulic, Fluid Mechanics and Fluid Machines, Dhanpat Rai and sons, 2006

With effect from the A.Y 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING

SYLLABUS FOR BE 2/4 - FIRST SEMESTER

ELECTRONICS ENGINEERING – I

Instruction : 4 Periods / week	Sem. Exam Marks : 70	Subject Ref. Code : EC 2140
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3Hrs.

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 Reading:

1. Jacob Millman and Halkias," Electronic devices and circuits", 2nd Edition, McGraw Hill Publication, 3/e,2010.
2. Jacob Millman, Christos C. Halkias, "Integrated electronics: analog and digital circuits and systems", 2nd Ed, Mc Graw-Hill, 2010.
3. David Bell, "Fundamentals of Electronic Devices and Circuits", 5th Edition, Oxford University Press 2008.
4. Donald L schilling & Charles Belove, Electronic circuits: Discrete & Integrated, McGraw Hill International Edition, 3rd Edition,1989.
5. Robert L. Boylestad, Louis Nashelsky "Electronic Devices and Circuit Theory", 10th Edition, PHI, 2009

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 FIRST SEMESTER
FINISHING SCHOOL: COMMUNICATION SKILLS IN ENGLISH-I

Instruction : 4 Periods/ week	Sem Exam Marks : 70	Subject Ref Code : HS 2170
Credits : 2	Sessional Marks: 30	Duration of Sem Exam :3 Hours

Course Objective	Course Outcome
• 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 AND ELECTRONICS ENGINERING

SYLLABUS FOR B.E. 2/4 FIRST SEMESTER

CIRCUITS AND MEASUREMENTS LAB

Instruction : 3 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : **EE 2031**
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3Hrs.

Course objective:	Course Outcomes:
Enable the student 1. To have fair knowledge about Transient, Frequency response of RLC-circuits and Parameters of network. 2. To understand the various theorems concepts and their application. 3. To understand the construction, working principles, calibration and applications of different types of Analog instruments – Ammeter, Voltmeters, Watt meter, Energy meter and Potentiometers. 4. To have the knowledge of measurement of circuit elements R, L & C using bridges.	1. Able to **identify** and **choose** the proper type of theorem to solve the circuits. 2. Able to **identify** and **choose** the proper type and range of meter to measure current, voltage, Power and Energy. 3. Student can **calibrate** ammeter, voltmeter and wattmeter using the Potentiometer. 4. Student can **calculate** the R, L & C values using the proper bridges.

LIST OF EXPERIMENTS

PART- A: CIRCUITS

1. Charging discharging characteristics of RC series circuit
2. Locus diagram of a RC/RL Circuit
3. Frequency response of a RLC series circuit
4. Parameters of Two Port network
5. Verification of Theorems a) Thevenin's Theorem b) Norton's Theorem c) Super Position theorem d)Max. Power Transfer Theorem
6. Characteristics of Linear / Non-Linear and Bilateral elements
7. Transient in RLC Circuits
8. Application of PSPICE to electrical circuits

PART -B : MEASUREMENTS

1. Measurement of low resistance by Kelvin's Double Bridge
2. Calibration of Single phase energy meter by Phantom Loading
3. Measurement of Induction by Maxwell's and Anderson's Bridge
4. Measurement of capacitance by De Sautry's bridge
5. Measurement of Iron losses by Lloyd Fischer square
6. Use of D.C Potentiometer for measurement of unknown voltage and impedance
7. Calibration of 3-phase Energy meter (Electromagnetic/static) by direct loading
8. Use of Oscilloscope and plotting B.H Curve and calculation of iron loss

Note: At least 5 experiments should be completed from each part.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 FIRST SEMESTER

ELECTRONICS ENGINEERING – I LAB

Instruction : 4 Periods / week	Sem. Exam Marks : 50	Subject Ref. Code : EC 2401
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

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.

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, TMH 2001
2. S.Poorna Chandra,B. Sasikala, Electronics Laboratory Primer, A design approach, Wheeler publishing,1998.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 FIRST SEMESTER

BASIC ELECTRICAL ENGINEERING LAB (For ECE)

Instruction : 3 Periods/week	Sem. Exam Marks : 50	Subject Ref. Code: **EE 2041**
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam: 3 Hrs.

Course objective:	Course Outcomes:
To impart the practical knowledge on measuring of 3-phase power, performance and speed control of DC machines and AC machines.	Students will be able to 1. Identify suitable instruments in the application of DC and AC machines. 2. Analyze the performance and speed control of DC Machines. 3. Analyze the performance and speed control of Induction motor. 4. Analyze the performance of an alternator. 5. Analyze the performance of single phase transformer. 6. Compute a 3-phase power by using 2-Watt meters.

List of Experiments:

1. Magnetization curve of a separately excited D.C. generator.
2. The load characteristics of a D.C. shunt generator.
3. The load characteristics of a D.C.series generator.
4. Performance characteristics of a D.C. shunt motor
5. The load characteristics of a D.C. series motor
6. The performance characteristics of DC compound motor.
7. Speed control of D.C. shunt motor
8. O.C. and S.C. tests on single phase transformer
9. Load test on a single phase transformer
10. Performance characteristics of a three phase induction motor
11. Speed control methods of an induction motor
12. Regulation of alternator by O.C. and S.C. tests.
13. Measurement of three-phase power by two Wattmeter methods

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION w.e.f 2016-17
ELECTRICAL AND ELECTRONICS ENGINEERING
B.E. II YEAR - II-SEMESTER

S No.	Code	Subject	Scheme of Instruction Periods per week L	T	D	P	Scheme of Examination Duration in Hrs	Maximum Marks SEM Exam	Sessionals	Credits
1	EE2040	Electrical Circuits-II	4	1	-	-	3	70	30	3
2	EE2050	Digital Electronics and Logic Design	4	-	-	-	3	70	30	3
3	EE2060	Power Systems-I	4	1	-	-	3	70	30	3
4	EE2070	Electrical Machinery-I	4	1	-	-	3	70	30	3
5	EC2290	Electronics Engineering-II	3	1	-	-	3	70	30	3
6	CE2090	Environmental Studies	4	-	-	-	3	70	30	3
7	HS2140	Human Values and Professional Ethics-I	2	-	-	-	3	70	30	1
8	HS2270	Finishing School: Communication Skills in English-II	4	-	-	-	3	70	30	2
		PRACTICALS								
9	EC2501	Electronics Engineering-II Lab	-	-	-	3	3	50	25	2
10	ME2031	Mechanical Technology Lab	-	-	-	3	3	50	25	2
		Total	**30**	**4**	**-**	**6**		**660**	**290**	**25**
		Grand Total	**39**					**950**		**25**
		INTERDISCIPLINARY COURSE-THEORY /LAB								
		THEORY								
1	EE2090	Electrical Circuits and Machines (For Mech.)	4	-	-	-	3	70	30	3
2	EE2100	Electrical Technology (for Civil)	3	-	-	-	1.5	35	15	2
		PRACTICALS								
3	EE2111	Electrical Circuits and Machines Lab (for Mech.)	**-**	**-**	**-**	3	3	50	25	2

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER
ELECTRICAL CIRCUITS - II

Instruction : 4+ 1 period/ week	Sem. Exam Marks : 70	Subject Ref. Code : **EE 2040**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
1. To analyze the electrical circuits transients for various inputs (step, impulse, sinusoidal etc.) 2. To apply Laplace Transforms to analyze the transients in circuits with various inputs 3. To implement and analyze the Fourier Series and Fourier Transform applications to Electrical circuits 4. To synthesise the networks in Foster's and Cauer's forms for the given transfer functions of the various electrical systems.	By the end of the course, students should be able to 1. Write down differential-equation models for linear circuits, understand, obtain and analyze the transient response of networks containing various Energy storage elements such as Resistance, Inductance and Capacitance using classical and Laplace Transform methods 2. Evaluate Laplace Transforms and evaluate the Laplace transforms of various time domain functions such as, impulse, unit step, ramp, sinusoidal and exponential functions. 3. Apply several mathematical techniques underlying systems/signal analysis, including Laplace-domain analysis, Fourier series, and Fourier Transforms. 4. Apply several mathematical techniques underlying systems/signal analysis using Laplace transforms, Fourier series, and Fourier Transforms for analyzing the electrical circuits. 5. Analyze and synthesize the various network functions using Foster's and cauer's forms

Unit I

Transient Response: Initial and final (Steady - State) conditions in circuit elements (R,L,C), in 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 delta, Unit step, Ramp, sinusoidal 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 analysis with Laplace transforms, circuit analysis in the S (Complex variable) domain. Concept of transfer function, Pole-Zero plots.

Unit IV

Fourier series representation of periodic functions using both trigonometric and exponential functions. Amplitude and Phase spectrums, application to linear circuits. Symmetry conditions, Fourier transform representation of aperiodic signals, Symmetry properties, Power and bandwidth concepts. System function and its application in determining steady- state response.

Unit V

Network Synthesis: Hurwitz polynomials and their properties, Positive Real functions and their properties, Synthesis of reactive network (one port) by Foster's I and II forms, pole-zero interpretations of elements of Foster form, Cauer's I and II forms of synthesis of reactive networks, RL network synthesis by Foster's and Cauer's forms (I and II) of representation, RC network systems by Foster's and Cauer's forms (I and II).

Suggested Reading:

1. M.R. Van Valkenburg, *Network Analysis*, Prentice Hall of India, 3rd Edition, 1995.
2. 2.W.H.Hayt, J.E.Kimmerly, *EngineeringCircuitAnalysis*,McGrawHill,6th Edition, 2002
3. N.C. Jagan & C. Lakshminarayana, *Network Analysis and Synthesis*, B.S. Publications 2004.
4. 4.Charles K.Aleximder &Matthew N.O.Sadiku, Fundamental of Electric Circuits, Tata MCGraw-Hill, 2003.
5. Gopal G Bhise, Prem R Chadha & Durgesh, C. Kulshreshtha Engineering Network Analysis & Filter Design, Umesh Publications.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

DIGITAL ELECTRONICS AND LOGIC DESIGN

Instruction: 4 Periods /week	Sem. Exam Marks : 70	Subject Ref. Code : **EE 2050**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
To impart the knowledge of combinational and sequential digital circuits.	1. Comprehend the number system and apply programmable logic devices to implement the logic functions. 2. Explain and apply logic gates, Boolean algebra, k-map and tabulation method for implementation of logic functions. 3. Classify different logic families. 4. Design different combinational circuits. 5. Design Sequential Circuits.

UNIT-I

Boolean Algebra and Combinational Logic : AND, OR and NOT operations – Laws of Boolean Algebra – minimization of Boolean expressions – truth tables and maps – sum – of products and product of sums – map method of reduction – incompletely specified functions – multiple output minimization – tabular minimization.

UNIT-II

Digital logic Families and IC's: Tabular minimization – Digital logic families and IC's-Characteristics of Digital IC's –introduction to RTL, DTL, TTL, CMOS, ECL families, Details of TTL logic family- totem pole, open collector ouputs. Wired AND operation, Comparision of performance, TTI subfamilies – multiplexer and demultiplexer – encoder and decoder – code converters, implementation of combinational logic using standard logic gates and multiplexers.

UNIT-III

Binary arithmetic and circuits: Half adder and Full adder – Subtractor and Magnitude comparator – number complements – two's complement arithmetic – carry look ahead adder – decimal numbers and their codes – BCD and Excess – 3 arithmetic.

UNIT-IV

Synchronous sequential Circuits: Basic latch circuit – debouncing switch – SR, JK, D and T flip-flops truth-table and excitation table – ripple and synchronous counters – up/down counter – general BCD counter – shift registers – ring counters.

UNIT-V

Design of Digital Systems: Concept of state. State diagram – design of counters – sequence detectors – sequence generators –Design procedure, synthesis using D, JK,T flip-flops-applications of registers-concepts of programmable , logic – PROM, PLA, PAL

Suggested Reading:

1. Morris Mano M., Digital Design, Prentice Hall of India, Second Edition, 1994.
2. Zvi Kohavi, Switching and Finite Automata Theory, Tata McGraw Hill, Second Edition, 1991
3. Tocci & Widmer_Digital Systems-Pearson Education-8th Edition, 2003.
4. Donald Pleach/Albert Paul Malvino/ Goutam Saha: Digital Principles and Applications" Mc Graw-Hill, 2006.
5. B. Somnath Nair, Digital Electronics and Logic Design, Prentice Hall, India, 2002

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

POWER SYSTEMS – I

Instruction : 4+1 Period/week	Sem. Exam Marks : 70	Subject Ref. Code : **EE 2060**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

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. Have the knowledge of construction of Overhead lines, materials, Supports, insulators and Underground cables. 4. Learn the fundamentals of Transmission line Parameters – Inductance, Capacitance, Composite conductors, GMD, GMR, Transposition of conductors and Bundled conductors. 5. Understand the Economics of Power Generation, Types of costs, Depreciation, methods of P.F. improvement, Tariffs and 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 b different Nonconventional Generating stations. 3. **Test** and **categorize** the insulator and **calculate** the Sag & Tension i Overhead lines. 4. **Calculate** the Transmission line Parameters – Inductance and Capacitance for Single Phase & 3 – Phase. 5. **Assess** the P.f. improvement methods, Tariffs and **differentiat** 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 Radiation, Solar collectors, Concentrators. Wind generators, Wind turbine types, rotors construction, Hybrid power generation.

UNIT – III

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

UNIT- IV

Inductance and Capacitance of Transmission Lines single phase and three phase with symmetrical and unsymmetrical composite conductors, GMR and GMD spacing's, transposition, bundled conductors, effect of earth capacitance.

UNIT – V

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

Suggested Reading

1. C.L. Wadhwa, Electrical Power Systems, Wiley Eastern Ltd. 5th Edition, 2005
2. C.L. Wadhwa, Generation, Distribution and Utilisation of Electrical Energy, Wiley Eastern Ltd., 5th Edition, 2005
3. S.N.Singh- Electrical Power Generation, Transmission and Distribution-Prentice Hall Pvt.ltd. New-2003.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

ELECTRICAL MACHINERY – I

Instruction : 4+1 Period week	Sem. Exam Marks : 70	Subject Ref. Code **EE 2070**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

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 also 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 4. appropriate D.C motor to meet the requirements of the application in industry 5. Able to Test the performance of single phase Transformer 6. Able to choose a suitable three phase 7. 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, Basic concepts of magnetically induced emf and force.

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, Auto Transformer

UNIT – V

Three Phase Transformers: Three phase transformers connections Y-Y, Δ-Δ, Δ-Y, Y-Δ, V-V and Scott connections

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

Suggested Reading:

1. P.S. Bhimbra Electrical machinery, Khanna Publications,7th edition,2003.
2. Fitzgerald, Kingsley, Umans, Electric Machinery, Tata Mc-Graw Hill Publications, 6th edition, 2002.
3. Nagrath I.J & Kothari D.P, Electrical Machines, Tata McGraw Hill Publications, Sigma series, 2006.
4. Theory and performance of electrical machines by J.B Gupta ,S.K. Kataria & Sons,14th edition,2014.
5. H.Cotton, Advanced Electrical Technology, Wheeler & Co,7th edition, CBS publishers,2005.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

ELECTRONIC ENGINEERING – II

Instruction : 4 /week	Sem. Exam Marks : 70	Subject Ref. Code **EC 2290**
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

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, Wein bridge 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 Reading:

1. Jacob Millman, Christos C.Halkias, and Chetan Parikh, "Integrated Electronics", 2nd Edition, McGraw Hill Publication, 2009
2. Jacob Millman, Christos C.Halkias and Satyabrata Jit, Electronic Devices and Circuits, McGraw Hill,3/e,2010.
3. Jacob Millman & Herbert Taub,Pulse, Digital and switching waveforms,TMH,3/e, 2011.
4. Robert L. Boylestad, "Electronic Devices and Circuit Theory", 6th Edition, PHI, 1998
5. Donald Schilling, Charles Belove, Tuvia Apelewicz Raymond Saccardi, "Electronic Circuits: Discrete and Integrated", TMH, 3rd Edition
6. Roody and Coolen, "Electronic Communications", 4th Edition, Pearson Education, Reprint 2007

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

ENVIRONMENTAL STUDIES

Instruction : 4 /week	Sem. Exam Marks : 70	Subject Ref. Code CE 2090
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 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, energy flow in ecosystem along with 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 pollutions and environmental protection acts. 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 and environmental protection acts. 5. Explain the causes, effects of climate change, global warming, acid rain and ozone layer depletion, various types of disasters and their mitigation measures and list the methods of water conservation and watershed management.

UNIT-I :

Environmental Studies: Definition, scope and importance, need for public awareness. Natural resources: Water resources; floods, drought, conflicts over water, dams-benefits and problems. Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources, growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

UNIT-II :

Ecosystems: Concepts of an ecosystem, structure and functions of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, oceans, estuaries).

UNIT-III

Biodiversity: Genetic species and ecosystem diversity. Value 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 pollutions, noise pollution, thermal pollution and solid waste & e-waste management.

Environment Protection Act: Air, water, forest and wild life acts.

UNIT-V :

Social Aspects and the Environment: Water conservation, watershed management, and environmental ethics. Climate change, global warming, acid, rain, ozone layer depletion. EIA, population explosion.

Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology, disaster management cycle, and disaster management in India.

Suggested Reading

1. Deswal S. and Deswal A., *A Basic Course on Environmental studies*, Dhanpat Rai & Co Pvt. Ltd. 2004.
2. Benny Joseph, *Environmental Studies*, Tata McGraw-Hill, 2005.
3. Suresh K. Dhameja, *Environmental Studies*, S.K. Kataria & Sons, 2010.
4. De A.K., *Environmental Chemistry*, New Age International, 2003.
5. Odum E.P., *Fundamentals of Ecology*, W.B. Sunders Co., USA, 2004.
6. Sharma V.K., *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi, 1999.
7. Rajagopalan R., *Environmental Studies*, Second Edition, Oxford University Press, 2013.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER
HUMAN VALUES AND PROFESSIONAL ETHICS-I

Instruction : 2 Periods per week	Sem Exam Marks : 70	Subject Ref Code : HS2140
Credits : 1	Sessional Marks : 30	Duration of Sem Exam : 3 Hours

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

UNIT-I:

The purpose of Life-Individual to society to the ideal –individual transformation as a stepping stone to idealism- the flow of transformation from individual to society – An awakened society as a basis to move towards the concept of idealism. How do lifestyles and habits affect the basic behavior? What is the roadmap to a healthy lifestyle and how does it impact the individual, furthermore, how does it enhance the purpose of life.

Philosophy of Life from different cultures–value of life–Objective of life-The Physical, Mental and Emotional aspects of Man-Building an integrated personality. Ways and means to accomplish it.

UNIT-II:

Time Management-Why is it essential? Impediments-how best to manage time? Benefits of effective time-management. How to make the best of the present?

UNIT-III:

Positive thinking-The need, nature and scope of positive Thinking-Positive thinking as a foundation to success and building character – Introspection and Self-analysis-identifying the desirable traits-Building of right character. Meaning of values versus skills. Self-worth and Professional worth. Professional Obligations and Competence. Work-life balance.

UNIT-IV:

Different lifestyles and habits- Excellence-Professional & Personal ethics in Society-Goals-Striking a balance between excellence and goals and how to aim for excellence and achieve it with ethics.

UNIT-V:

Potentials and harnessing Potentials-Self-Hidden Potentials-Weeding out Weaknesses-Channelizing the potential. Optimizing potential to achieve goals.

Learning Resources:

1. B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
2. A.N Tripathy, 2003 Human values, New Age International Publishers.
3. EG Seebauer & Robert L. Berry,2000, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.
4. Mike Martin and Ronald Schinzinger "Ethics in Engineering "McGraw Hill
5. Charles E Haris, Micheal J Rabins, " Engineering Ethics "Cengage Learning

With effect from the A.Y 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER
FINISHING SCHOOL: COMMUNICATION SKILLS IN ENGLISH-II

Instruction : 4 periods/week	Sem. Exam Marks : 70	Subject Ref. Code : HS 2270
Credits : 2	Sessional Marks: 30	Duration of Sem. Exam : 3Hrs.

Course Objective	Course Outcome
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.	• 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. • choose appropriate words and tone to present accurate, specific, and factual reports. • Compose a summary of beginning high level reading text that identifies the thesis and key supporting details. • Summarize with 70% comprehension. • 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:
- o Recognition of author's purpose
- o Awareness of stylistic differences
- o Discernment of fact and opinion
- o Evaluation of fact and opinion
- o Recognition of propaganda techniques
- o Present vocabulary building methods
- o 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 AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

ELECTRONICS ENGINEERING – II LAB

Instruction : 4 periods/week	Sem. Exam Marks : 50	Subject Ref. Code : EC2501
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

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

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:

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

2.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

MECHANICAL TECHNOLOGY LAB

Instruction : 3 periods/week	Sem. Exam Marks : 50	Subject Ref. Code : ME 2031
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

Course Objectives	Course Outcomes
The objectives of this course are to: • Conduct experiments by applying principles of heat transfer and Refrigeration • conduct experiments on I. C. Engines and two stage air compressor • conduct experiments on flow meters, hydraulic pumps and turbines	On completion of the course the student will be able to: • Evaluate the performance of internal combustion engine • Analyze the performance of multi stage air compressor • Determine the flash and fire point of a given fuel using flash and fire point apparatus. • Calculate the hydraulic efficiency, discharge and power output of hydraulic turbines and pumps • Plot the theoretical discharge Vs actual discharge of venturi meter and orifice meter.

LIST OF EXPERIMENTS:

1. Performance test on multi cylinder/single cylinder diesel engine.
2. Measurement of discharge by venturi meter.
3. Measurement of discharge by Orifice meter.
4. Determination of heat flow through lagged pipe
5. Determination of Heat transfer coefficient under Natural Convection
6. Determination of volumetric efficiency and Isothermal Efficiency of Two stage reciprocating air compressor
7. Performance characteristics of Francis Turbine
8. Performance characteristics of Pelton wheel
9. Performance characteristics of reciprocating pump
10. Performance characteristics of centrifugal pump
11. Determination of effectiveness of parallel flow and counter flow heat exchanger
12. Determination of COP refrigeration test rig

With effect from the A.Y 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER
ELECTRICAL CIRCUITS AND MACHINES (FOR Mechanical)

Instruction : 4 periods/week	Sem. Exam Marks : 70	Subject Ref. Code : EE2090
Credits : 3	Sessional Marks: 30	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
To impart fundamental concepts of DC and AC circuits, three phase circuits, transformers, DC machines, three phase induction motors and special motors to enable the students to understand and choose the motors in engineering applications.	1. Apply the fundamental concepts to solve the problems in DC and AC circuits. 2. Distinguish three phase connections, calculate power and analyze the behaviour of transformer. 3. Demonstrate the principle of operation and performance characteristics of DC Machines. 4. Select suitable three phase induction motor and also interpret speed control method for different applications. 5. Identify suitable single phase induction motor , Stepper motor and BLDC motor for various applications.

UNIT-I

DC & AC Circuits: Analysis of circuits using loop current method, Thevenin's and Norton's theorems, Sinusoidal sources, Phasor representation of sinusoidal quantities, Average and RMS values, Active power, Reactive power, Energy stored in inductance and capacitance, Mutual inductance, Dot convention, analysis of simple coupled circuits.

UNIT-II

Production of 3-Phase Voltages: Analysis of 3-phase balanced circuits, 3-phase power measurement by two wattmeter method. Transformers: Principle of transformation of voltages and currents, Equivalent circuits of transformer on no load and load, Efficiency and regulation of transformer, OC and SC tests, Auto-transformer.

UNIT - III

DC Machines: Construction and working principle of a DC machine, production of emf in a generator, Types of excitation, Characteristics of series, shunt and compound motors, Speed control and application of DC motors, Losses and efficiency.

UNIT - IV

Induction Motors: Production of rotating magnetic field, Construction and principle of operation of induction motors, Speed-torque characteristics, Methods of starting and Speed control of 3-phase induction motors.

UNIT - V

Single-Phase & Special Motors: Various types of single phase motors, Split phase, Capacitor start and capacitor run, Basic features of Stepper motor and Brushless DC motor.
Applications of variable frequency(speed) drives.

Suggested Reading

1. V.K. Metha, Principles of Electrical Engineering, S.Chand & Co., 1995
2. Kothari and Nagrath, Basic Electrical Engineering, Tata McGraw Hill, 2nd Edition, 2002

With effect from the A.Y 2016-17

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 *SECOND* SEMESTER
ELECTRICAL TECHNOLOGY (For Civil)

Instruction : 4 periods/week	Sem. Exam Marks : 35	Subject Ref. Code : EE2100
Credits : 2	Sessional Marks: 15	Duration of Sem. Exam : 1.5 Hrs.

Course objective:	Course Outcomes:
To impart the fundamental concepts of electrical technology such that under graduate students apply his knowledge in civil engineering projects.	1. Explain the fundamental concepts of electric circuits and apply KCL and KUL to DC, 1-ϕ, 3-ϕ AC Circuit. 2. Demonstrate the working and application of transformers and determine efficiency and regulation. 3. Illustrate the working and application of Induction Motor and apply the concept of illumination to engineering application.

UNIT-I

Introduction and Applications in Civil Engineering.

D.C. Circuits: Ohm's Law, Kirchoff's Laws, resistance networks; series, parallel and series – parallel circuits with D.C. Sources, Power loss in resistive elements.

Alternating Currents: Principles of production of AC wave form, frequency, effective value and form factor, effective values of currents and voltages, vector representation, behavior of pure inductance, capacitance, and resistance with sinusoidal sources. Impedance and power factor, simple A.C network with R,L & C elements under steady state; three phase circuits under balanced conditions, Star-delta connections, Power in balance three–phase circuit.

UNIT-II

Transformers: Ideal transformers, principle of transformation, working of actual transformer – under no load and load conditions. Approximate equivalent circuit, OC & SC tests, regulation and efficiency.

UNIT - III

Induction Motors: Types of induction motors, Production of rotating magnetic field – synchronous speed, torque production, slip and speed of motor, slip-torque characteristics, starting of induction motors, applications of induction motors.

Illumination: Units of light measurement, Coefficient of utilization and depreciation. Polar curves, Calculations of street lighting.

Suggested Reading:

1. J. B. Gupta, Fundamentals of Electrical Engineering, S.K. Kataria & Sons, 2012
2. V.K. Metha, Principles of Electrical Engineering, S.Chand & Co., 1995
3. Kothari and Nagrath, Basic Electrical Engineering, Tata McGraw Hill, 2nd Edition, 2002

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SYLLABUS FOR B.E. 2/4 SECOND SEMESTER

ELECTRICAL CIRCUITS & MACHINES LAB

(For Mech. Engineering)

Instruction : 3 periods/week	Sem. Exam Marks : 50	Subject Ref. Code : EE2111
Credits : 2	Sessional Marks: 25	Duration of Sem. Exam : 3 Hrs.

Course objective:	Course Outcomes:
To impart the practical knowledge on basic theorems, measuring of 3-phase power, performance and speed control of DC machines and AC machines.	Students will be able to 1. Identify suitable instruments in the application of DC and AC machines. 2. Analyze the performance and speed control of DC Machines. 3. Analyze the performance and speed control of Induction motor. 4. Analyze the performance of single phase transformer. 5. 5. Compute a 3-phase power by using 2-Watt meters.

LIST OF EXPERIMENTS:

1. Verification of Thevenin's and Norton's Theorems
2. Measurement of 3-Phase Power by Two Wattmeter Method
3. Study of Single-Phase R, L & C Series & Parallel Circuits
4. Study of Self and Mutual Inductance of Coils and their Interconnections
5. Magnetization Curve of a Separately Excited DC Generator
6. Load Characteristics of a DC Shunt Generator
7. Performance Characteristics of a DC Shunt Motor
8. Performance Characteristics of a DC Compound Motor
9. Performance Characteristics of a DC Series Motor
10. Speed Control of DC Shunt Motor.
11. O.C. and S.C. Tests on Single - Phase Transformer.
12. Performance Characteristics of 3-Phase Induction Motor.
13. Speed Control Methods of 3-Phase Induction Motors.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINERING
SCHEME OF INSTRUCTION AND EXAMINATION W.E.F 2015-16
2/4B.E. Bridge Course (for Lateral Entry Students of all branches)

I-Semester

S No.	Code	Subject	Scheme of Instruction				Scheme of Examination			
			Periods per week				Duration	Maximum Marks		Credits
			L	T	D	P		SEM Exam	Sessionals	
Theory										
1	MA2040	Mathematics	1	-	-	-	90 min	25	-	-
2	PH2130	Physics of materials	1	-	-	-	90 min	25	-	-
3	CE2080	Engineering Mechanics	2	-	-	-	3 hrs	50	-	-
Practicals										
4	CS 2091	C-Programming Lab	-	-	-	2	3 hrs	50	-	-
			4	**-**	**-**	**2**	**-**	**150**	-	-
II-Semester Practical										
1	HS2231	ELT-LAB	-	-	-	2	3	50	-	-

No credits will be awarded to the bridge courses offered at 2/4 B.E (all branches) lateral entry students admitted from the academic year 2015-16 under autonomous status. However pass in each of these courses is mandatory to obtain the degree. Every student shall get 40% marks in each course for a pass in theory subject and 50% marks in laboratory course. Only semester examinations will be conducted at the end of each semester. The marks/Grades obtained by the student in this course ***will not be added in computing the SGPA/CGPA***

DEPARTMENT OF CIVIL ENGINEERING

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER (All branches)
ENGINEERING MECHANICS

Instruction :2 periods week	Subject Reference Code: **CE2080**
Semester Exam Marks : **50**	Duration of Semester Exam: **3 Hrs**

COURSE OBJECTIVES	COURSE OUTCOMES
1. To **learn** the resolution of a system of spatial forces. 2. To **assess** the frictional forces on rigid body. 3. To **understand** the concepts of dynamics and its principles. 4. To **explain** kinetics and kinematics of particles, projectiles, curvilinear motion and centroidal motion. 5. To **impart** the concepts of work-energy method and its applications to rectilinear translation, centroidal motion.	***students will be able to:*** 1. **Judge** whether the body under the action of spatial force system. 2. **Solve** problem of bodies subjected to friction. 3. **Distinguish** between statics and dynamics and differentiate between kinematics and kinetics. 4. **Understand** the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatary motion and rigid body motion. 5. **Know** the concepts of work and energy principles subject and derive the work energy equations for translation, rotation and connected systems.

UNIT-I (3 periods)

Force Systems: Components of forces, moments in space and its applications.

UNIT-II (4 periods) :

Friction: Laws of friction. Application to simple systems and wedge friction.

UNIT-III (5 periods) :

Kinematics: Rectilinear motion, Curvilinear motion, Velocity and acceleration of a particle.

UNIT-IV (6 periods) :

Kinetics: Analysis as a particle. Analysis as a rigid body in translation. Fixed axis rotation and Rolling bodies.

UNIT-V (5 periods) :

Work Energy: Principles of work-energy, and its application to translation, Particle motion and connected systems.

Learning Resource:

1. F.L.Singer, "Engineering Mechanics", Harpper & Collins, Singapore 1994.
2. S.P.Timoshenko and D.H.Young, "Engineering Mechanics", McGraw Hill International Edition, 1983
3. Andrew Pytel., Jaan Kiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
4. F.P.Beer & E.R.Johnston, "Jr. Vector Mechanics for Engineers", TMH, 2004.
5. R.C.Hibbeler & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2008.
8. Meriam. J. L., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2008.
9. NPTEL Course and Virtual labs on the web.

w.e.f. the academic year 2015-16

DEPARTMENT OF MATHEMATICS

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER (for All branches)

MATHEMATICS

Instruction :1 period week	Subject Reference Code: **MA2040**
Semester Exam Marks : **25**	Duration of Semester Exam: **90 Min**

Unit -I (6 Periods):

Basics of Statistics & Probability: Measure of central tendency (Mean, Median & Mode) - Definition of Probability - Addition & Multiplication theorem - Discrete random variable

Unit – II (6 Periods):

Integral Calculus: Methods of integration- Multiple Integrals - Applications of Integration - areas - Surface areas - Volume of solid of revolution

LEARNING RESOURCES:

1. B.S. Grewal , Higher Engineering Mathematics.
2. Fundamentals of Mathematical Statistics by Gupta & Kapoor
3. Integral calculus by Shantinarayana

DEPARTMENT OF PHYSICS

SYLLABUS FOR BRIDGE COURSE BE 2/4 - FIRST SEMESTER (All branches)

PHYSICS OF MATERIALS

Instruction :1 period week	Subject Reference Code: **PH2130**
Semester Exam Marks : **25**	Duration of Semester Exam: **90 Min**

Course objectives	Course Outcomes *Student should be able*
• To apply basic principles of physics in field of engineering • Analyze the characteristics of semiconductor devices • To take up research at Undergraduate Level in new and emerging areas like materials science including magnetic dielectrics and nanotechnology	• Differentiate properties, characteristics and applications of various materials like magnetic, dielectric and semiconducting materials • Inquire the new trends in interdisciplinary research area such as Magnetic materials, dielectric materials Semiconductors and nanotechnology

UNIT -I

1. Dielectric Materials: (3 periods)

Polar and Non polar dielectrics-Different types of polarizations in dielectrics- Ferro-electric materials: properties and applications.

2. Magnetic Materials: (3 periods)

Ferro, Ferri and anti ferro magnetic materials and their properties, Domain theory of ferromagnetism- Hysteresis (B-H) curve-soft and hard magnetic materials

UNIT – II:

1. Semiconductor Devices: (3 periods)

Fermi energy in semiconductor- Intrinsic carrier concentration of semiconductor-Characteristics of Photo diode and solar cell

2. Nano Materials: (3 periods)

Distinction between Bulk, thin and nano material-Surface to volume ratio-Quantum confinement-Basic properties of nano-materials, Applications of Nano materials and CNT's.

LEARNING RESOURCES:

1. Introduction to Solid State Physics, Kittel C, Wiley Eastern
2. A text book of Engineering Physics, Avadhanulu & Kshirasagar
3. Applied Physics for Engineers, Neeraj Mehta, PHI
4. N Chattopadhyay, K. K.Banerjee- Introduction to Nanoscience and Nanotechnology, PHI

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS FOR BRIDGE COURSE BE 2/4-FIRST SEMESTER (for All branches)
C-PROGRAMMING LAB

Instruction :2periods/week	Subject Reference Code: **CS 2091**
Sem Exam Marks: **50**	Duration of Sem Exam:**3hr**

Course objective	Course outcomes
Students should be able to	Students will be able to
• understand the fundamentals of programming in C Language • write, compile and debug programs in C • formulate problems and implement in C • effectively choose programming components to solve computing problems	• draw flowcharts and write algorithms for a given problem • choose appropriate data types for writing programs in C language • design programs involving input output operations, decision making and looping constructs • design modular programs

1. Finding roots of quadratic equation
2. Check whether a given number is (i) Prime (ii) Perfect (iii) Am Strong
3. Sin x and Cos x values using series expansion.
4. Menu driven program to calculate income tax
5. Generating Pascal's Triangle
6. Frequency of occurrence of characters and special characters like \n, \t, white spaces.
7. Bubble sort, Selection sort using arrays
8. Linear search and Binary Search.
9. Functions to find maximum and minimum of given set of numbers, interchange two numbers
10. Recursion: Factorial, Fibonacci, GCD of given numbers
11. Functions for string manipulations without using library functions
12. String comparisons and sorting using pointers to strings.
13. Matrix addition and multiplication using pointers
14. Programs on Structures and Unions
15. File handling programs, Finding the no: of characters, words and lines of given text file.
16. **Mini Project**: Simple application using the concepts of C language

Learning Resources:

1. B.A.Forouzan & Richard F.Gilberg, *A Structured Programming Approach using C*, 3rd Edition, Cengage Learning, 2013
2. Brian W. Kernighan and Dennis M. Ritchie, *The C Programming Language* 2nd Edition, Prentice-Hall, 2006
3. E.Balagurusamy, *Programming in ANSI C*, TMG, 4th Edition, 2008.

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES (for All branches)
SYLLABUS FOR BRIDGE COURSE BE 2/4 – SECOND SEMESTER
ELT-LAB

Instruction :2 periods week	Subject Reference Code: **HS2231**
Semester Exam Marks : **50**	Duration of Semester Exam: 2hrs

Course objectives	Course Outcomes
• Use language effectively without mother tongue influence. • Converse in various situations. • Make paper and power point presentations. • Listen to audio clippings, exchange dialogues and write short texts. • Speak effectively using discourse markers. • Read and understand various forms of texts and review them.	• Pronounce words in isolation as well as in spoken discourse. • Research and sift information to make presentations. • Comprehend the tone and tenor of various types of speeches from media and classroom lectures. • Listen for gist and make inferences from various speeches. • Identify connectives and transitions in various speeches. • Use connectives and make transitions effectively while speaking

PHONETICS LAB- TOPICS

1 **Introduction to English Phonetics:** Introduction to auditory, acoustic and articulatory phonetics. Organs of speech: the respiratory, articulatory and phonatory systems
2 **Sound System of English:** Phonetic sounds, Introduction to International Phonetic Alphabet, Classification and Description of English Phonemic sounds; Minimal pairs: The Syllable: Types of syllables; Difficulties of Indian speakers with sound of English.
3 **Rhythm and Intonation:** Introduction to rhythm and intonation; Major patterns of intonation in English with their semantic implications; difficulties of Indian speakers with sound of English.

INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

1 **Group discussion:** Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD.
2 **Debate:** Understanding the differences between a debate and a group discussion, essentials of debate, concluding a debate.
3 **Presentation Skills:** Making Effective Presentations, Expressions which can be used in Presentations, Use of Non-Verbal Communication, Coping with Stage Fright, Handling Question and Answer Session; Use of Audio-Visual Aids, PowerPoint Presentations.
4 **Public Speaking:** Advantages of public speaking, essentials of an effective speech, types of delivery, rehearsal techniques, planning and delivering a speech.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ALMANAC FOR B.E - II & III year - I Semester [all branches]

S.No.	Particulars	Date
1	Commencement of Instruction	11-07-2016
2	I Class Test	29-08-2016 to 01-09-2016
3	II Class Test	26-10-2016 to 29-10-2016
4	Last date of Instruction	29-10-2016
5	Preparation holidays & Practical Examinations	31-10-2016 to 12-11-2016
6	Commencement of Theory Examinations	14-11-2016

ALMANAC FOR B.E - II & III year - II Semester [all branches]

S.No.	Particulars	Date
1	Commencement of Instruction	26-12-2016
2	I Class Test	13-02-2017 to 16-02-2017
3	II Class Test	11-04-2017 to 15-04-2017
4	Last date of instruction	15-04-2017
5	Preparation holidays & practical Examinations	17-04-2017 to 29-04-2017
6	Commencement of Theory Examinations	01-05-2017
7	Summer vacation	01-05-2017 to 08-07-2017
8	Commencement of I Semester for the Academic year 2017-2018	10-07-2017

E - JOURNALS & E-BOOKS SUBSCRIBED	
ASCE	35
ASME	27
IEEE ASPP	155
ACM Digital Library	1138
Springer Mechanical	49
Total GIST E-Journals	1405
DELNET CONSORTIUM (IESTC E-Journals -2016)	1152
DELNET E-Journals	817
Total e-journals	3374
DELNET MEMBERSHIP E-Books	335
Journals and magazines Print version	106