VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF
ELECTRONICS & COMMUNICATION ENGINEERING

BE II/IV – I & II SEMESTERS
SCHEME OF INSTRUCTION AND SYLLABI

With effect from the academic year 2015-16

DEPARTMENT VISION

Striving for an excellence in teaching, training and research in the area of Electronics and Communication Engineering.

DEPARTMENT MISSION

To inculcate a spirit of scientific temper and analytical thinking and train the students in contemporary technologies in Electronics and communication to meet the needs of the industry.

COLLEGE VISION

Striving for a symbiosis of technological excellence and human values

COLLEGE MISSION

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. II/IV (Regular)-I SEMESTER

ELECTRONICS AND COMMUNICATION ENGINEERING [ECE]

S. No	Subject reference Code	Subject	Scheme of Instruction				Scheme of Examination			
			Periods per Week				Duration in Hrs	Maximum Marks		Credits
			L	T	D	P		SEM Exam	Sessionals	
THEORY										
1	MA 2010	Mathematics-III	4	-	-	-	3	70	30	3
2	EC 2010	Basic Circuit Analysis	4	1	-	-	3	70	30	3
3	EC 2020	Electronic Materials & Devices	4	1	-	-	3	70	30	3
4	ME 2060	Elements of Mechanical Engineering	4	1	-	-	3	70	30	3
5	CE 2090	Environmental Studies	4	-	-	-	3	70	30	3
6	HS 2170	Finishing School-I	2	1	-	-	3	70	30	2
PRACTICAL										
7	EC 2311	Electronic Devices Lab	-	-	-	3	3	50	25	2
8	EC 2321	Basic Circuits and Simulation Lab	-	-	-	3	3	50	25	2
9	EE 2031	Basic Electrical Engineering Lab	-	-	-	3	3	50	25	2
		TOTAL	**22**	**4**	**-**	**9**	**-**	**570**	**255**	**23**
		GRAND TOTAL	**35**					**825**		

INTERDISCIPLINARY COURSE OFFERED TO OTHER DEPARTMENTS (CSE & EEE)

THEORY										
1	EC 2130	Basic Electronics	4	1	-	-	3	70	30	3
2	EC 2140	Electronics Engineering	4	1	-	-	3	70	30	3
PRACTICAL										
1	EC 2391	Basic Electronics Lab	-	-	-	3	3	50	25	2
2	EC 2401	Electronics Engineering-I Lab	-	-	-	3	3	50	25	2

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD-31

SCHEME OF INSTRUCTION & EXAMINATION

B.E. II/IV – 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										
Practicals										
1	HS2231	ELT-LAB	-	-	-	2	3	50	-	-

No credits are awarded to the bridge courses offered to 2/4 B.E (all branches) lateral entry students taking admissions 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 the each semester.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

9-5-81, Ibrahimbagh, Hyderabad-500031

DEPARTMENT OF

ELECTRONICS AND COMMUNICATION ENGINEERING SYLLABUS FOR B.E. II/IV- I SEMESTER

MATHEMATICS –III

Instruction: 4 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **MA 2010**
Credits : 3	Sessional Marks: 30	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
• To understand the basics of Fourier series, partial differential equations. Applications of partial differential equations in one dimensional wave, heat and Laplace equations • To study the basic numerical methods to find the solution of algebraic, transcendental equations and also the numerical techniques for finding derivatives, solutions of ordinary differential equations and their applications. • To study the fundamentals of probability, statistics, distributions, testing of hypothesis, curve fitting, correlation, regression, lines of regression and their applications	The student is able to • Understand the basics of Fourier series, partial differential equations. Applications of partial differential equations in one dimensional wave, heat and Laplace equations. • understand study the basic numerical methods to find the solution of algebraic, transcendental equations and also the numerical techniques for finding derivatives, solutions of ordinary differential equations and their applications • Understand the fundamentals of probability,statistics, distributions, testing of hypothesis, curve fitting, correlation, regression, lines of regression and their applications.

UNIT –I

Fourier series: Introduction to Fourier series – Conditions for a Fourier expansion – Functions having points of discontinuity – Change of Interval - Fourier series expansions of even and odd functions - Fourier Expansion of Half- range Sine and Cosine series.

UNIT –II

Partial Differential Equations and its Applications: Formation of first and second order Partial Differential Equations - Solution of First Order Equations – Linear Equation - Lagrange's Equation, Non-linear first order equations - Charpit's method

Applications of Partial Differential Equations: Method of Separation of Variables - Solution of One **D**imensional Heat Equation - One Dimensional Wave Equation - Laplace's Equation.

UNIT-III

Numerical Methods: Solution of Algebraic and Transcendental equations**-** Bisection method - Regula Falsi method- Newton-Raphson Method - Solution of Linear System of Equations - Gauss- Seidel Iteration Method – Interpolation- Newton's Forward and Backward Interpolation Formulae - Lagrange's Interpolation Formula - Newton's Divided Difference Formula - Numerical Differentiation -Interpolation approach- Numerical Solutions of Ordinary Differential Equations - Taylor's Series Method - Euler's Method - Runge-Kutta Method of 4^{th} order(without proofs).

UNIT-IV

Probability and Statistics: Random variables – Discrete Probability Distribution – Continuous Probability Distribution - Expectation – Variance – Moments -Moment Generating Function- Poisson and Normal Distributions – Testing of Hypothesis - Tests of Significance - t-test - F- test - χ^2 - test for small samples.

UNIT-V

Curve Fitting: Curve fitting by the Method of Least Squares**,** Fitting of Straight line – Parabola - Exponential Curves- Correlation – Karl Pearson's Co-efficient of Correlation - Spearman's Rank Correlation, Regression - Lines of Regression.

Learning Resources:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal 40^{th} Edition, Khanna Publishers.
3. Numerical Methods, Dr.B.S Grewal Khanna Publishers.
4. Fundamentals of Mathematical Statistics, Gupta & Kapoor, Sultan chand & sons, New Delhi.
5. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
6. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
7. Numerical Analysis by S.S.Sastry –PHI Learning Ltd.,

FOR BE II/IV -I SEMESTER
BASIC CIRCUIT ANALYSIS

Instruction: 4 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2010**
Credits : 3	Sessional Marks: 30	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
Course Objective: Students will be able to analyze the response of the circuit and using various concepts such as network theorems, mesh & nodal analysis and topology and the frequency response of the circuit.	students should be able to: • Solve circuits using various theorems and network topology. • Analyze the circuits for dc, sinusoidal and exponential inputs and also magnetically coupled circuits. • Find the frequency response and phasor analysis of ac circuits. • Able to apply cutset and tieset topology concepts and test the principle of duality for a circuit.

UNIT-I

Basic concepts of Electric Circuits: Lumped circuit elements, Dependent and independent voltage and current sources, Energy and power, Ohm's law, Kirchhoff's laws, network reduction techniques, nodal and super nodal analysis, mesh and super mesh analysis.

Network Theorems to DC circuits: Source transformation, Star and Delta transformations, Superposition theorem, The venin's and Norton's Theorem, Maximum power transfer theorem, Reciprocity theorem, Tellegen's theorem

UNIT-II

Response of circuits for Unit step input: Linear time invariant first order and second order circuits, Formulation of Integro differential equations. Transient and steady state analysis for series and parallel RL, RC and RLC circuits, Zero Input Response (ZIR), Zero State Response (ZSR) and complete response.

UNIT-III

Response of circuits for sinusoidal and exponential inputs: Transient and steady state response of RC, RL and RLC networks for Sinusoidal and exponential signals. Network theorems to a.c circuits.

Calculation of power in a.c circuits: phasor and vector representations average power, apparent power, complex power, power triangle.

UNIT-IV

Magnetic Coupled Circuits: Concept of Self, Mutual inductance, co-efficient of coupling, dot convention rules and analysis of simple circuits.

Resonance: Analysis of Series and Parallel resonance, Q-factor, Selectivity and bandwidth.

UNIT-V

Frequency Domain Analysis: Concept of complex frequency, Impedance and Admittance functions, Pole-Zero cancellation, Calculation of natural response from pole zero plots.

Network Topology: Topological description of Network: graph, tree, co-tree, link, chord, incidence matrix, tieset, tieset matrix, cutset, cutset matrix. Formation of node and loop equations. Principle of duality and dual networks.

Learning Resources:

1. William H. Hayt, Jr., Jack E. Kemmerly and Steven M. Durbin, *Engineering Circuit Analysis*, 5th edition, McGraw Hill, 2010.
2. Van.valkenberg M.E Network analysis, PHI, New Delhi, 3rd edition 2002.
3. Chakrabarti, *Ciruit Theory* Dhanapati Rai & Co(Pvt.)Ltd., Educational & Technical Publishers,
4. Charles A. Desoer and Ernest S Kuh, *Basic Circuit Theory*, McGraw Hill, 2009.
5. Raymond A. DeCarlo and Penmin Lin, Linear Circuit Analysis, 2nd edition, Oxford Univ. Press, 2003.
6. Lawrence P. Huelsman, *Basic Circuit Theory*, 3rd edition,2009.

FOR BE II/IV -I SEMESTER
ELECTRONIC MATERIALS & DEVICES

Instruction: 4+1Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC2020**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hrs.

Course Objective:	Course Outcomes
To familiarize the students with various two terminal and three terminal electronic devices working and implementation and use in the design of real time electronic products.	• Analyze the operation and design aspects of diode under various conditions. • Illustrate the use of diode in practical applications and gain knowledge on special diodes. • Design aspects and functionality of Bipolar junction Transistor and analyzing its operation as an amplifier • Design aspects and functionality of Field effect transistors.

UNIT – I

Materials: Types of materials – gasses, Liquids & solids, Different types of solids – conductors, insulators & semiconductors (intrinsic, N-type & P-type), Interface between metal-metal, metal-semiconductor and semiconductor-semiconductor (PN & Shotkey contact).

Junction Diode : Different types of PN Junction formation techniques, PN Junction Characteristics, biasing- band diagrams and current flow, Diode current equations under forward bias and reverse bias conditions, Junction breakdown in diodes and breakdown voltages, effect of temperature on diode characteristics, Diode as a circuit element, small signal diode models, Junction capacitance under forward bias and reverse bias, Diode switching characteristics, Zener Diodes, Zener voltage regulator and its limitation.

UNIT – II

PN Diode Applications: Half wave, Full wave and Bridge rectifiers - their operation, performance characteristics, and analysis; Filters (L, C, LC and CLC filters) used in power supplies and their ripple factor calculations, design of Rectifiers with and without Filters. **Specials Diodes**: Elementary treatment on the functioning of Tunnel, Varactor, Photo, Light Emitting diodes. **Display devices**: Study of block diagram of typical display device.

UNIT – III

Bipolar Junction Transistor : Transistor Junction formation (collector-base, base-emitter Junctions) Transistor biasing-band diagram for NPN and PNP transistors, current components and current flow in BJT, Early effect, BJT input and output characteristics in CB, CE CC configuration, BJT as an amplifier, BJT biasing techniques, Thermal runway, heat sinks and thermal stabilization, operating point stabilization against temperature and device variations, stability factors, Bias stabilization .

UNIT – IV

Small Signal Transistors equivalent circuits : Small signal low frequency h-parameter model of BJT, Determination of h parameters, analysis of BJT amplifiers using h-parameter, comparison of CB, CE and CC amplifier configurations, Analysis of BJT amplifier with approximate model. **Special Devices:** working of UJT, SCR, DIAC, TRIAC

UNIT – V

Junction Field Effect Transistors (JFET): JFET formation, operation & current flow, pinch-off voltage, V-I characteristics of JFET. JFET biasing-zero drift biasing. Low frequency small signal model of FETs. Analysis of CS, CD and CG amplifiers and their comparison. FET as an amplifier and as a switch. MOSFETs: MOSFETs, Enhancement & Depletion mode MOSFETs, V-I characteristics. MOSFET as resistor, MOSFET as a switch. Introduction to CMOS.

Learning Resources:

1. Millman and Halkias," Electronic devices and circuits", 2nd Edition, McGraw Hill Publication, 2007
2. Adel S.Sedra and Kenneth C.Smith "Micro Electronic Circuits theory and applications" sixth edition Oxford publications.
3. M Satyam, K Ramkumar, " Foundations of Electronic Devices", Wiley Eastern Limited, 1990.
4. Robert L. Boylestad, Louis Nashelsky "Electronic Devices and Circuit Theory", 10th Edition, PHI, 2009
5. David Bell, "Fundamentals of Electronic Devices and Circuits", 5th Edition, Oxford University Press 2008.
6. Ben G Streetman and Sanjay Banerjee, "Solid State Electronic Devices", 6thEdition, Pearson Education, 2005.
7. Jacob Millman, Christos C. Halkias, "Integrated electronics: analog and digital circuits and systems", 2nd Ed, Mc Graw-Hill, 2010

FOR BE II/IV -I SEMESTER
ELEMENTS OF MECHANICAL ENGINEERING

Instruction: 4+1Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **ME 2060**
Credits : 3	Sessional Marks: 30	Duration of Sem Exam:3Hrs.

Course Objective:	Course Outcomes
students shall: • Learn the basic principles of Mechanical Engineering in the areas of Thermodynamics, Heat transfer, Refrigeration, IC Engines, Compressors, Manufacturing and Kinematics of Machines	students should be able to: • Understand the Thermodynamic laws and their applications. • Understand the modes of heat transfer and different types heat exchangers. • Understand the principles of refrigeration. • Understand the basic manufacturing processes. • understand the principles of kinematic links

UNIT– I

Thermodynamics: Concept of system, process and properties, laws of thermodynamics, concept of entropy and Clausius inequality, steady flow energy equation for an open system.
IC Engines: Working of Four Stroke and Two Stroke Petrol and Diesel Engine with p– V diagrams, Valve timing diagram, Calculation of Indicated power, Brake power, Specific Fuel Consumption, Mechanical and Thermal efficiencies.
Reciprocating Air Compressors: Work done, efficiency of multistage compressors, Effect of clearance volume.

UNIT– II

Heat Transfer: Basic modes of heat transfer, Fourier's law of conduction, Newton's Law of cooling, Stefan– Boltzman Law of radiation and one dimensional steady state conduction heat transfer through plane walls without heat generation.
Heat Exchangers: classification and applications of heat exchangers in industry, derivation of LMTD in parallel and counter– flow heat exchangers and problems.

UNIT– III

Refrigeration: Types of Refrigeration systems–Air Refrigeration system, vapor compression system, ammonia– water absorption refrigeration system, thermoelectric refrigeration system, COP and representation of cycle on T-S and H-S diagrams, Types and properties of refrigerants, eco– friendly refrigerants, Introduction to Psychometry and Psychometry processes.

UNIT– IV

Basic Manufacturing Processes: Welding, Brazing, Soldering, brief description of process and parameters, associated principles of gas welding, arc welding.

Casting: Sand casting, Die casting and principles and applications.

Forming: Basic concepts of forming processes: Extrusion, rod/wire drawing, Forging and Rolling.

Principles and Applications of basic Machine Processes: Turning, Drilling and Shaping.

UNIT– V

Definition of kinematic link and pair, mechanism and machine. **Gears:** Classification of gears, nomenclature, **Gear Trains:** Simple, compound, inverted and epi– cycle gear trains.

Belt and Rope drives: Open and crossed belt drives, Length of belt, Ratio of tensions of flat belt, condition for maximum power transmission for flat belt.

Learning Resources:

1. RK Rajput, Thermal Engineering, Laxmi Publications, 2005
2. C. Sachdeva, Fundamentals of Engineering heat and mass transfer, Wiley Eastern Ltd., 2004.
3. PN Rao, Manufacturing Technology, Vol. 1 & 2, Tata McGraw hill Publishing Co., 2010.
4. Thomas Bevan, Theory of Machines, CBS Publishers, 1995.

FOR BE II/IV -I SEMESTER
ENVIRONMENTAL STUDIES

Instruction: 4 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **CE 2090**
Credits : 3	Sessional Marks: 30	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
the students will 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.	*students will be able to* 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.

Learning Resources:

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.

SYLLABUS FOR BE II/IV -I SEMESTER
FINISHING SCHOOL-I

Instruction : 2 Periods per week	Semester Exam Marks :70	Subject Reference Code **HS 2170**
Credits : 2	Sessional Marks : 30	Duration of Sem Exam : 3 Hr

COURSE OBJECTIVES Students should be able to	**COURSE OUTCOMES** Students will be able to
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 the appropriate words so as to speak and write accurately. 4. Read various types of texts and sift information correctly. 5. Write notes and letters for personal and official purposes.	1. Listen and analyze context, tone and tenor before responding to others. 2. Begin, sustain and end conversation. 3. Respond to people in different situations. 4. Read with adequate speed and comprehend various texts. 5. Use words appropriately in different contexts for speaking and writing. 6. Use markers in written discourse. 7. Construct grammatically correct sentences to write effectively.

SECTION –I
Soft skills (35 Marks)

UNIT-I : ORAL COMMUNICATION: LANGUAGE FUNCTION IN CONTEXT

- Greeting People and responding to greetings
- Making and responding to introductions
- Making and responding to requests
- Making , accepting and refusing invitations
- Taking permissions
- Thanking people and responding to thanks

UNIT-II: AURAL COMMUNICATION: LISTENING TO VARIOUS SPEAKERS AND TEXTS

- Listening for meaningful chunks of information
- Listening for gist and specific information

UNIT-III: READING: COMMUNICATING WITH A GIVEN TEXT

- For gist
- For details
- To target questions
- For main idea
- For supporting details to the main idea

UNIT-IV : WRITING: PERSONAL AND OFFICIAL COMMUNICATION

- Basic structures of texts
- Punctuation
- Letters
- Types of sentences

UNIT-V: GRAMMAR

- Relative clauses
- Subject verb
- Prepositions
- Common errors

VOCABULARY

- Collocations
- Phrasal verbs
- Idioms
- Adjectives for descriptions

SECTION-II

Technical skills (35 Marks)

UNIT-I: Advanced Logic Design Using C:

Revision and Logic forming using C Semantics, Arrays, Functions, Strings, Structures, Unions; advanced concepts and handling of different data types and functions with pointers.

UNIT-II: Implementation of Data Structures using C:

Concepts of Linked list – Singly List, Doubly List, Sorting Algorithms of singly and doubly linked lists (Insertion/Deletion of a node in the given list); Searching algorithms for a singly and doubly linked list; Introduction of Trees and Graphs.

UNIT-III: Fundamentals of Operating Systems

General Architecture of Operating Systems, Processes and Process management, CPU scheduling algorithm, memory management, I/O management, system software

UNIT-IV: UNIX Operating System as a detailed case study; Mini project work/ Case Study/Assignment using C

Learning Resources:

1. Data Structures Using C "Aaron M. Tenenbaum" Pearson Education India
2. Data Structure Using C Pearson Education India, 2011 A K Sharma
3. Data Structures with C (Schaum's Outline Series) Paperback – 21 Sep 2010 by Seymour Lipschutz (Author)"
4. Modern Operating Systems (3rd Edition) 3rd Edition by Andrew S. Tanenbaum (Author)

FOR BE II/IV -I SEMESTER
ELECTRONIC DEVICES LAB

Instruction: 3 Periods/Week	Sem Exam Marks: 50	Subject Reference Code : **EC 2311**
Credits : 2	Sessional Marks: 25	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
To develop an understanding of the underlying concepts of Electronic devices and circuits with Qualitative approach	students should be able to: • Verify the working of PN Junction diodes, transistors and their characteristic behavior. • Learn design of different rectifiers with various filter combinations. • Set up bias point in a transistor. • Build an amplifier and find the frequency response of amplifier.

List of Experiments:

1. Zener Diode Characteristics and Zener as Voltage Regulator
2. Design of Half wave and Full wave Rectifiers with and without Filters
3. Characteristics of PHOTO DIODE
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. Characteristics of UJT and Seven Segment LED Display
8. BJT Biasing
9. FET Biasing
10. Analysis and bandwidth calculation of Single stage RC coupled CE Amplifier.
11. Analysis and bandwidth calculation of Single stage RC coupled CC Amplifier.
12. Single stage FET Common Source RC coupled Amplifier
13. Characteristics of SCR and study of TRIAC characteristics
14. Analysis & Design of circuits using PSPICE(Minimum of five experiments).

Learning Resources:

1. Robert Diffenderfer, "Electronic Devices Systems and Applications", Cengage Learning India Private Limited, 2010
2. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text - Lab Manual", 7thEdition, TMH 2001

FOR BE II/IV -I SEMESTER
BASIC CIRCUITS AND SIMULATION LAB

Instruction: 3 Periods/Week	Sem Exam Marks: 50	Subject Reference Code : **EC 2321**
Credits : 2	Sessional Marks: 25	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
To apply the concepts of circuit theory for a given complex circuit and verify its response using discrete components and CAD tools.	At the end of the course students should be able to: • Identify the appropriate network theorem to analyze for a given network. • To determine different two port network parameters for a given network and also characterize the network from the two port parameters. • To simulate and find the response of a given circuit using CAD tools.

List of Experiments:

Part -A

1. Verification of superposition theorem and Thevenin's theorems
2. Verification of maximum power transfer theorem
3. Verification of Tellegan's theorem
4. Measurement of two-port network parameters
5. Design & verification of Series Resonance
6. Design & verification of Parallel Resonance

Part –B (using SPICE)

1. Determination of two port network parameters in the presence of at least one dependent source.
2. Transient response of RL and RC circuits.
3. Verification of network theorems in the presence of dependent source.
4. Transient response of RLC series and parallel circuits.
5. Measurement of power factor and power relationships.

Learning Resources:

1. Muhammad H. Rashid, "Spice for Circuits and Electronics Using PSPICE" 2/e, 2001, PHI.
2. John O. Attia, "PSPICE and MATLAB for Electronics: An Integrated Approach" 2/e, CRC Press, 2002.

FOR BE II/IV -I SEMESTER
BASIC ELECTRICAL ENGINEERING LAB

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

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.	• Identify suitable instruments in the application of DC and AC machines. • Analyze the performance and speed control of DC Machines. • Analyze the performance and speed control of Induction motor. • Analyze the performance of an alternator. • Analyze the performance of single phase transformer. • 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 shunt generator.
3. The load characteristics of a series generator.
4. Performance characteristics of a D.C. shunt motor
5. The load characteristics of a D.C. series motor
6. The performance characteristic of DC compound motor.
7. Speed control of D.C. motor
8. O.C. and S.C. tests on single phase transformer
9. Load test on single phase transformer
10. Performance characteristics of a three phase induction motor
11. Speed control methods of induction motor
12. Regulation of alternator by O.C. and S.C. tests.
13. Measurement of three-phase power by two Wattmeter method.

FOR BE II/IV -I SEMESTER
BASIC ELECTRONICS (For CSE)

Instruction: 4+1Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2130**
Credits : 3	Sessional Marks: 30	Duration of Sem Exam:3Hrs.

Course Objective:	Course Outcomes
• The course enables the students to acquire the knowledge of various electronic devices and their applications.	students will be able to: • Employ different electronic devices to build electronic circuits such as rectifiers, amplifiers, voltage regulators and oscillators. • Implement digital circuits such as adders and subtractors using logic gates. • Convert real time signals into corresponding electrical signals using different types of transducers.

UNIT - I

Semiconductor Theory: Classification of semiconductors, Energy Levels, Conductivity, Mobility, Diffusion and Drift currents, Hall Effect, Characteristics of P-N Junction diode, Parameters and Applications. **Rectifiers:** Half wave and Full wave Rectifiers (Bridge, center tapped), ripple factor and efficiency, comparison of rectifiers, Filters, types of filters, Rectifiers with and without filters

UNIT - II

Transistors: Bipolar Junction Transistor, Construction, Types, Working principle, Configurations, Transistor parameters, Transistor as an amplifier, Problems, h-parameter equivalent circuits. Field effect transistor, Construction and working of JFET, Parameters and applications of JFET, Types of MOSFET (depletion and enhancement), Comparison of BJTs with JFETs; **Regulators:** Characteristics of Zener Diode, Voltage Regulation, Zener diode as voltage regulator, IC voltage regulators.

UNIT - III

Feedback Concepts – Basic concept of feedback, Types of feedback, Feedback topologies, General characteristics of Negative feedback amplifiers; **Oscillators** – Classification of Oscillators, Types, LC Type and RC Type Oscillators and Crystal Oscillators (Qualitative treatment only)

UNIT - IV

Operational Amplifiers – Introduction, Characteristics of ideal Operational amplifier, Operational amplifier stages, Parameters, Open loop and closed loop configurations, Applications (Adder, Subtractor, Voltage follower, Integrator, Differentiator, Instrumentation Amplifier); **Digital circuits:** Boolean Algebra, Logic Gates, Combinational circuits such as half and full adders, half and full subtractors.

UNIT - V

Data Acquisition systems: Introduction, Classification of transducers, Capacitive transducer, Inductive transducer, LVDT, Electrical strain gauges, Temperature transducers (Thermocouple), Piezoelectric transducer, Photoelectric transducer; **Photo Electric Devices:** Photo diode, Photo Transistor, LED, LCD; **Industrial Devices:** SCR, TRIAC, DIAC, UJT - Construction, Working principle and Characteristics only; **Display Systems:** Constructional details of C.R.O and Applications.

Learning Resources:

1. S.Shalivahan, N. Suresh Kumar, A Vallavea Raj Electronic Devices and Circuits Tata McGraw Hill, 2003.
2. Jacob Milman & C., Halkias, Electronic devices Eighth Edition, Reprinted, Mc Graw Hill,1985.
3. Ramakanth A. Gayakwad, Op-AMPS and Linear Integrated Circuits, 3rd edition, Prentice Hall of India,1985.
4. Mooris Mano, Digital design, 3rd edition, Prentice Hall of India,2002.
5. Cooper, Electronic Measurement and Instrumentations.

FOR BE II/IV -I SEMESTER
ELECTRONICS ENGINEERING – I (For EEE)

Instruction: 4+1Periods/Week	Sem Exam Marks: 70	Subject Reference 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.	**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 amplifiers; 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, cascode 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.

Learning Resources:

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

FOR BE II/IV -I SEMESTER
BASIC ELECTRONICS LAB (For CSE)

Instruction: 3 Periods/Week	Sem Exam Marks: 50	Subject Reference Code : **EC 2391**
Credits : 2	Sessional Marks: 25	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
• Lab course enables the students to verify the characteristics of various electronic devices and circuits.	**A students will be able to:** • Verify input/output characteristics of active devices and to compute their parameters. • Perform operations such as addition, subtraction, comparison of voltage levels using operational amplifier. • Implement digital adders and subtractors using logic gates.

1. Characteristics of Semiconductor (Si and Ge) and Zener diodes
2. CRO Applications
3. Full wave rectifier with and without filter
4. Zener Voltage Regulator
5. Characteristics of BJT (CB and CE)
6. Characteristics of FET
7. Amplifier with and without feedback
8. RC Phase shift oscillator
9. Hartley oscillator and Calpitt's Oscillator
10. Applications of Operational Amplifier: Adder, Subtractor, Comparator.
11. Verifications of Logic gates
12. Realization of Half and Full adder

Learning Resources:

1. Paul B. Zbar, Albert P. Malvino , Michael A. Miller, Basic Electronics, A Text-Lab Manual, 7th Edition, TMH, 1994.
2. Paul B. Zbar, Industrial Electronics, A Text – Lab Manual, 3rd Edition, TMH, 1983.

General Note :

Mini Project cum design exercise:

a) The students must design, rig-up, and test the circuits wherever possible and should carry out the experiments individually.
b) This exercise carries sessional marks of 10 out of 25, while the remaining 15 marks are for the remaining lab exercises.

FOR BE II/IV -I SEMESTER
ELECTRONICS ENGINEERING – I LAB (For EEE)

Instruction: 3 Periods/Week	Sem Exam Marks: 50	Subject Reference Code : **EC 2401**
Credits : 2	Sessional Marks: 25	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
To develop an understanding of the characteristics of Electronic devices and circuits with Qualitative approach	**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.

Learning Resources:

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.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

SCHEME OF INSTRUCTION AND EXAMINATION FOR B.E. II/IV – II SEMESTER

ELECTRONICS AND COMMUNICATION ENGINEERING [ECE]

S. No.	Subject reference Code	Subject	Scheme of Instruction				Scheme of Examination			
			Period per week				Duration in Hrs	Max. marks		Credits
			L	T	D	P		SEM Exam	Sessionals	
THEORY										
1	MA 2030	Mathematics – IV	4	-	-	-	3	70	30	3
2	EC 2150	Analog Electronic Circuits	4	1	-	-	3	70	30	3
3	EC 2160	Electromagnetic Theory	4	1	-	-	3	70	30	3
4	EC 2170	Networks and Transmission Lines	4	1	-	-	3	70	30	3
5	EC 2180	Signal Analysis and Transform Techniques	4	1	-	-	3	70	30	3
6	EC 2190	Pulse, Digital and Switching Circuits	4	1	-	-	3	70	30	3
7	HS 2140	Human Values and Professional Ethics	2	-	-	-	3	70	30	1
8	HS 2230	Finishing School-II	2	1	-	-	3	70	30	2
PRACTICALS										
9	EC 2411	Electronics Circuits Lab	-	-	-	3	3	50	25	2
10	EC 2421	Simulation Lab for Signals and Systems	-	-	-	3	3	50	25	2
		TOTAL	**28**	**6**	**-**	**6**	**-**	**660**	**290**	**25**
		GRAND TOTAL	**40**					**950**		

INTERDISCIPLINARY COURSE OFFERED TO OTHER DEPARTMENTS (ME & EEE)

THEORY										
1	EC 2280	Applied Electronics	4	1	-	-	3	70	30	3
2	EC 2290	Electronics Engineering - II	4	1	-	-	3	70	30	3
PRACTICALS										
1	EC 2491	Applied Electronics Lab	-	-	-	3	3	50	25	2
2	EC 2501	Electronics Engineering - II Lab	-	-	-	3	3	50	25	2

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderabad-500031
DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING SYLLABUS
FOR BE II/IV -II SEMESTER
Mathematics –IV

Instruction: 4Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **MA 2030**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hrs.

Course Objective:	Course Outcomes
• To study the Laplace transforms and Z-transforms to solve differential and difference equations. • To understand the concepts of fourier transforms and its applications • To understand the basics of differentiation and integration of complex functions using Cauchy-Riemann equations, Cauchy's theorem and Cauchy's integral formula to find the complex integration, to find the real integrals using Cauchy's Residue theorem around contours also to study biliear transformations, conformal mapping	**students should be able to:** • The student is able to understand the laplace transforms and Z-transforms to solve differential and difference equations • The student is able to understand the concepts of fourier transforms and its applications • The student is able to understand the basics of differentiation and integration of complex functions using Cauchy-Riemann equations, Cauchy's theorem and Cauchy's integral formula to find the complex integration, to find the real integrals using Cauchy's Residue theorem around contours also to study bilinear transformations, conformal mapping

UNIT- I

Laplace Transforms: Introduction to Laplace transforms - Inverse Laplace transform - Sufficient Condition for Existence of Laplace Transform –Properties of Laplace Transform- Laplace Transform of Derivatives - Laplace Transform of Integrals - Multiplication by t^n - Division by t – Evaluation of Integrals by Laplace Transforms- Convolution Theorem - Application of Laplace transforms to Linear Differential Equations with Constant Coefficients.

UNIT –II

Z-Transforms: Introduction - Z-transforms of Standard sequences - Linearity Property – Damping Rule - Shifting Properties- Multiplication by n - Initial and Final value theorems – Inverse Z-Transforms- Convolution Theorem – Application of Z-Transforms to Difference Equations.

UNIT-III

Fourier Transforms: Fourier Integral Theorem - Fourier Transforms – Inverse Fourier Transform - Properties of Fourier Transform –Fourier Cosine & Sine Transforms - Convolution Theorem.

UNIT-IV

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

UNIT-V

Power series - Taylor's Series - Laurent's Series - Zeros and Singularities – Residues – Cauchy's Residue Theorem -Evaluation of Real Integrals using Residue Theorem -Bilinear Transformation - Conformal Mapping.

Learning Resources:

1. Advanced Engineering Mathematics - R.K.Jain & S.R.K.Iyengar 3rd Edition, Narosa Publications
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.
3. Laplace's and Fourier transforms Goyal & Gupta, Pragati prakashan
4. Kreyszig E, Advanced Engineering Mathematics, 8 th Edition, John Wiley & Sons Ltd, 2006.
5. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
6. Higher Engineering Mathematics, H.K. Dass, Er.Rajnish Verma 2011 Edition S.Chand & company Ltd.
7. R.V. Churchill, "Complex Variables & its Applications".Mc Graw-Hill Book Company, INC.

SYLLABUS FOR BE II/IV -II SEMESTER
ANALOG ELECTRONIC CIRCUITS

Instruction: 4+1 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2150**
Credits : 3	Sessional Marks:30	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
To familiarize the students with design and working of various amplifiers and analyze concepts of positive and negative feedback.	**students should be able to:** • Analyze and design various amplifier circuits. • Apply feedback concepts in the amplifier and oscillator circuits. • Design power amplifiers and their stability considerations. • Distinguish ideal and practical Op-amp characteristics

UNIT – I

Small signal amplifiers: Classification of amplifiers, BJT and FET high frequency equivalent circuits, Mid-band analysis if single and multistage amplifiers, low frequency and high frequency analysis of single and multistage RC coupled and Transformer coupled amplifiers with BJT and FET.

UNIT – II

Feedback amplifiers: The feedback concept, general characteristics of negative feedback, Effect of negative feedback on input output impedances, voltage series and shunt feedbacks. Stability considerations, local versus global feedback

UNIT – III

Oscillators: Positive Feedback and conditions for sinusoidal oscillations, RC oscillator, LC oscillator Crystal oscillator, Amplitude and frequency stability of oscillator.

Regulators: Transistorized series and shunt regulators

UNIT – IV

Large signal amplifiers: BJT as large signal audio amplifier, Classes of operation, Harmonic distortion, power dissipation, efficiency calculations. Design considerations of transformer coupled and transformer less push-pull audio power amplifiers under Class-A, Class-B, Class-D, Class –AB operations, Qualitative analysis on
R.F. Tuned amplifiers.

UNIT – V

Differential Amplifiers: Classification, DC and AC analysis of single/dual input Balanced and unbalanced output Configurations using BJTs. Level Translator. Operational Amplifier: Op-amp Block Diagram, ideal Op-amp Characteristics, op-amp and its features, Op-Amp parameters & Measurements, Input and Output Offset voltages and currents, Slew Rate, CMRR, PSRR. Frequency Response and Compensation techniques.

Learning Resources:

1. Adel S.Sedra and Kenneth C.Smith "Micro Electronic Circuits theory and applications" sixth edition Oxford publications.
2. Jacob Millman, Christos Halkias, Chetan Parikh, "Integrated Electronics", 2nd Edition, McGraw Hill Publication, 2009
3. Donald Schilling, Charles Belove, TuviaApelewicz Raymond Saccardi, "Electronic Circuits: Discrete and Integrated", TMH, 3rd Edition
4. David Bell, "Fundamentals of Electronic Devices and Circuits", 5th Edition, Oxford University Press 2008
5. Robert L. Boylestad, "Electronic Devices and Circuit Theory", 6th Edition, PHI, 1998
6. Ben G Streetman and Sanjay Banerjee, "Solid State Electronic Devices", 6th Edition, Pearson Education, 2005
7. Roody and Coolen, "Electronic Communications", 4th Edition, Pearson Education, Reprint 2007.

SYLLABUS FOR BE II/IV -II SEMESTER
ELECTROMAGNETIC THEORY

Instruction: 4+1 Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2160**
Credits : 3	Sessional Marks:30	Duration of Sem Exam: 3Hrs.

Course Objective:	Course Outcomes
• To understand and analyze electromagnetic field theory, with an emphasis's on electromagnetic waves.	students should be able to: • Define and describe various laws related to static and dynamic EM fields. • Formulate and apply the Maxwell's equations and Electromagnetic field problems. • Describe and analyze the EM wave propagation.

UNIT - I

Cartesian, Cylindrical and spherical coordinate systems - review of vector analysis - Coulomb's Law. Electric Field Intensity. Electric field due to different charge distributions. Line of charge, sheet of charge and volume charge distributions. Electric flux, flux density, Gauss's Law and application. Divergence theorem.

UNIT-II

Energy and potential, Potential field of system of charges, potential gradient. Energy density, Boundary conditions in static electric field, Capacitance of two-wire line, Continuity equation, current density, Poisson's equation, Laplace equation, Uniqueness theorem, Applications of simple practical cases.

UNIT-III

Steady magnetic field, Biot-Savart's law, Ampere's law, Stroke's theorem, Magnetic scalar and vector potentials. Magnetic boundary conditions, Magnetomotive force, Permeability, self and mutual inductances, Evaluation of inductance of solenoid, toroid, coaxial cable, two-wire transmission line.

UNIT-IV

Time varying fields, Maxwells equations, Boundary conditions in EM field. EM wave equations in free space and conductors. Sinusoidal variations. Uniform plane wave, wave motion in free space. Wave motion in perfect dielectrics, lossy dielectrics and conductors. Polrization - linear, elliptical and circular polarizations.

UNIT-V

Energy theorem and Poynting vector, Instantaneous, average and complex Poynting vector. Reflection of plane waves by a perfect conductor, normal and oblique incidence. Reflection of plane waves by a perfect dielectric, normal and oblique incidence. Reflection coefficient. Transmission coefficient, power and energy calculations.

Learning Resources:

1. Jordan, E.C., Balmain, K.G. electromagnetic Waves and Radiating Systems, 2nd Edition, Prentice Hall of India, 2001.
2. Hayt. W.H. Engineering Electromagnetics, Tata McGraw Hill, 5th Edition, 1994
3. J.D.Krauss and Fleish, Electromagnetics with applications, 5th Edition, McGraw Hill, 1999.
4. Nannapaneni Narayana Rao, Elements of Engineering Electromagnetics, 6th edition, 2009.
5. Matthew N.O.Sadiku, Principles of Electromagnetics, 4th edition, Oxford Univ. Press, 2009.

SYLLABUS FOR BE II/IV -II SEMESTER
NETWORKS AND TRANSMISSION LINES

Instruction: 4+1Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2170**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3 Hrs.

Course Objective:	Course Outcomes
To provide a good insight into the characteristics of symmetrical and asymmetrical networks. Design of various filters and synthesis of networks using RC and RL functions. Properties of transmission lines and impedance matching in the transmission line.	**students should be able to:** • Analyze and design the four terminal network for different source and load impedances. • Synthesize the passive one port network in various forms using transfer function. • Characterize the properties of transmission lines at VHF, UHF and able to match impedance using transmission lines.

UNIT-I

Asymmetrical networks, Image and Iterative impedances. Image transfer constant and iterative transfer constant. Symmetrical networks, characteristic impedance and propagation constant. Properties of L, T and Pi section types.

UNIT-II

Constant K-filters – low pass, high pass, band pass, band elimination filter design, m-derived -- low pass, high pass, band pass, band elimination filter design
and composite filter design.

UNIT-III

Network synthesis: Hurwitz polynomials, positive real functions, L-C Immitance functions, RC impedance functions and RL admittance functions. RL impedance functions and RC admittance functions. Cauer And Foster's forms of RL impedance and RC admittance
Attenuators and their design. Equalizers and their design. Impedance matching networks. Inverse network elements.

UNIT-IV

Properties of transmission lines. Transmission line equations from source and load end. The finite and infinite lines. Velocity of propagation, input impedance. Open and short circuited lines, telephone cables, distortion less transmission, loading of cables, Campbell's formula.

UNIT-V

Properties of Transmission lines at UHF, Reflection co-efficient, Standing waves and SWR, Distribution of voltages and currents on loss less line. Characteristics of half wave, Quarter-wave and one eighth wave lines. Construction and applications of Smith chart. Transmission line matching. Single and double stub matching.

Learning Resources:

1. John D. Ryder, Networks, Lines and Fields, PHI, 2nd edition, 2009.
2. M.E. Van Valkenburg, Network Analysis, PHI, 3rd edition, 2009.
3. C.L Wadhwa, *Network Analysis and Synthesis,* New age Internal publishers revised 3rd edition.
4. Roy, Choudhury D., Networks and Systems, New Age International Publishers, 2nd edition, 2010.
5. Smarjit Ghosh, Network Theory : Analysis and Synthesis, PHI, 2009.

SYLLABUS FOR BE II/IV -II SEMESTER
SIGNAL ANALYSIS AND TRANSFORM TECHNIQUES

Instruction: 4+1Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2180**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hrs.

Course Objective:	Course Outcomes
To define and classify continuous and discrete time signals & systems and to determine the frequency domain characteristics of signals using various transform techniques and to perform the Convolution and correlation of signals.	**students should be able to:** • Understand the concepts of continuous and discrete time signals & systems, and to transform the time domain signal into frequency domain signal using various transform techniques. • Convert a continuous time domain signal to a discrete time domain signal using Sampling. • Perform the convolution and correlation of continuous and discrete time signals.

UNIT-I

Continuous Time Signals & Systems: Introduction, Elementary signals, Basic operations on signals and its classification. Introduction to systems and its classification. Analogy between vectors and signals - signal representation by a set of mutually orthogonal functions, Evaluation of mean square error, Orthogonality in complex functions.

Fourier Series: Review of Fourier series, Existence and Convergence, Trigonometric and exponential Fourier series representations and their relations, Symmetry conditions, Properties, Complex Fourier spectrum, Power Spectral Density (PSD).

UNIT-II

Signal Representation by Continuous Exponentials: Introduction to Fourier Transform, Existence, Fourier transform of singularity functions and signals, Properties, Fourier transform of a periodic function, Energy Spectral Density (ESD).

Signal Transmission Through Linear Systems: Introduction to Linear Time Invariant (LTI) system, Unit Impulse and step response, Transfer function of an LTI system, Filter characteristics of an LTI system, Distortion less transmission, Signal bandwidth, System bandwidth, Ideal filter characteristics, Causality and Paley-wiener criterion for physical realization.

UNIT-III

Sampling: Introduction to Sampling, Sampling Theorem, Aliasing, Sampling Techniques, Reconstruction.

Signal Representation by Generalized Exponentials: Introduction to Laplace transforms, Existence, Region of convergence (ROC) and it properties. Properties of Laplace transform. Inverse Laplace transform. Analysis and characterization of continuous LTI systems using Laplace Transform.

UNIT-IV

Discrete Time Signals & Systems: Introduction, Elementary signals, Basic operations on signals and its classification. Introduction to systems and its classification. Linear Shift invariant systems, Stability and Causality, Linear constant coefficient systems. Discrete Fourier Series (DFS), Discrete Time Fourier Transform (DTFT).

Z-Transforms: Introduction to Z-Transform, Existence, Region of Convergence (ROC) and its properties. S-plane and Z-plane correspondence, Properties of Z-Transform, Inverse Z-Transform, Analysis and characterization of discrete LTI systems using Z-Transform

UNIT-V

Convolution & Correlation: Continuous convolution - Graphical interpretation and Convolution properties. Discrete convolution- Graphical interpretation and Convolution properties. Continuous correlation-Cross correlation and Auto correlation, their graphical interpretation and properties. Discrete correlation-Cross correlation and Auto correlation, their graphical interpretation and properties.

Learning Resources:

1. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.
3. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2 Ed.
4. Signals and Systems – A.Rama Krishna Rao – 2008, TMH.
5. M.J. Robert " Fundamentals of signals and systems", McGraw Hill, 2008

SYLLABUS FOR BE II/IV -II SEMESTER
PULSE, DIGITAL AND SWITCHING CIRCUITS

Instruction: 4+1Periods/Week	Sem Exam Marks: 70	Subject Reference Code : **EC 2190**
Credits : 3	Sessional Marks:30	Duration of Sem Exam:3Hrs.

Course Objective:	Course Outcomes
▪ To familiarize the students with the concepts of wave shaping using linear & nonlinear circuits, switching characteristics of diodes. ▪ To design & analyse various Multi-vibrators. ▪ To understand the concepts of combinational and sequential circuits, analyse and Design the Combinational and sequential systems.	**students should be able to:** ▪ Construct different linear wave shaping networks and demonstrate their response. ▪ Analyze switching characteristics of diodes. ▪ Construct various multi-vibrators. • Design different combinational and sequential circuits.

UNIT- I

Wave-Shaping: RC, RL and RLC circuits, response to Step, Pulse, Square, Exponential and Ramp inputs. Integrating and differentiating circuits, Compensated attenuators. Non-linear wave shaping using Diodes and Transistors. Clipping and Clamping circuits, Clamping circuit theorem.

UNIT- II

Multi-vibrators: Analysis and design of Transistor Multivibrators – Bistable, Monostable and Astable circuits. Operation of regenerative comparator (Schmitt Trigger). Time base generators: Speed, transmission and displacement errors.

Analysis and Design of sweep circuits using UJT and SCR.

UNIT- III

Boolean – Algebra: Introduction to Boolean Algebra, Demorgan's theorem, Canonical forms and standard forms, Introduction to Logic Gates, Ex-OR, Ex-NOR operations, Simplification of switching functions using theorems,

Karnaugh map method, Quine McCluskey /Tabular method. Realization of Logic functions using AND-OR, OR-AND and NAND / NOR.

UNIT- IV

Combinational Logic Design: Binary Adders, Subtractors, Code converters, Decoders and Encoders, Priority Encoder, static and hazard free design.
Introduction to Sequential Logic: Types of Flip-Flops, Excitation Tables and Flip-Flop Conversions, Classification of sequential circuits.

UNIT- V

Sequential Logic Design: State Diagram and State Table, Design of synchronous and asynchronous counters, registers.
Finite State Machines: Moore Type and Mealy Type FSM, Design of Sequence Detector using Moore and Mealy FSM. One Hot Encoding.

Learning Resources:

1. Jacob Millman and Herbert Taub, Pulse, Digital and Switching Waveforms, TMH, 3rd edition, 2011.
2. M. Morris Mano and Michael D. Ciletti, "Digital Design", 4thEdition., Prentice Hall, 2007
3. Zvi Kohavi, Switching And Finite Automata Theory, TMH, 2nd edition, 2001.
4. David A. Bell, Pulse, Switching and Digital Circuits, 5th edition, OXFORD Higher Education, 2015.
5. Stephen Brown and Zvonko Vranesic, Fundamentals of Digital Logic with VHDL Design, TMH, 3rd edition, 2010.

SYLLABUS FOR BE II/IV -II SEMESTER
Human Values & Professional Ethics

Instruction : 2 Periods per week	Semester Exam Marks :70	Subject Reference Code **HS 2140**
Credits : 1	Sessional Marks :30	Duration of Sem Exam : 3 Hr

Course Objectives	Course Outcomes
students will	*students will 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. • 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

1. **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.
2. **Positive thinking-**The need, nature and scope of positive thinking-Positive thinking as a foundation to success.
3. **Character building** – 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.

4. **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.

5. **Different lifestyles and habits**-How they affect the basic behavior-Roadmap to a healthy lifestyle and impact on the wellbeing of an individual.
6. **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.
7. **Potentials and harnessing potentials**-Self-Hidden potentials-Weeding out weaknesses-Channelizing the potential. Optimizing potential to achieve goals.
8. **Time Management**-Why it is essential? Impediments-how to best manage time? Benefits of effective time-management. How to make the best of the present?
9. **Environmental Protection-Human Role**- how to conserve and respect nature-Efforts to restore ecological balance –the price of progress –case studies.
10. **Impact of global development towards seeking unity in diversity** –Society as a kaleidoscope of diversity –Seeing diversity as a positive aspect of creation –Looking beyond the curtain of diversity to a common source.

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
6. Caroline whitback < Ethics in Engineering Practice and Research, Cambridgs University Press
7. Georgs Reynolds, Ethics in Information Technology", Cengage Learning
8. Charles D.Fleddermann, " Engineering Ethics", Pearson Education Prentice Hall, New Jersey,2004 (Indian Reprint)
9. Value Education website, Http://www.universalhumanvalues.info

SYLLABUS FOR BE II/IV -II SEMESTER
FINISHING SCHOOL-II

Instruction : 2+1 Periods per week	Semester Exam Marks :70	Subject Reference Code **HS 2230**
Credits : 2	Sessional Marks :30	Duration of Sem Exam : 3 Hr

COURSE OBJECTIVES Students should	**COURSE OUTCOMES** Students will be able to
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 the appropriate words so as to speak and write accurately. 4. Read various types of texts and sift information correctly. 5. Write notes and letters for personal and official purposes.	1. Listen and analyze context, tone and tenor before responding to others. 2. Begin, sustain and end conversation. 3. Respond to people in different situations. 4. Read with adequate speed and comprehend various texts. 5. Use words appropriately in different contexts for speaking and writing. 6. Use markers in written discourse. 7. Construct grammatically correct sentences to write effectively.

SECTION –I
Soft Skills (35 Marks)

UNIT-I: ORAL COMMUNICATION: LANGUAGE FUNCTIONS IN CONTEXT

- Interpreting a conversation
- Apologizing and responding to apologies
- Expressing opinions
- Complimentary close to a conversation
- Expressing sympathy and condolences
- Describing a process

UNIT-II: AURAL COMMUNICATION: LISTENING TO VARIOUS SPEAKERS AND TEXTS

- Listening for gist and specific information
- Listening to identify cohesive devices and coherence in discourse
- Note-taking

UNIT-III: READING: COMMUNICATING WITH A GIVEN TEXT

- For supporting details
- Note Making
- For basic referential and inferential information

UNIT –IV: WRITING: PERSONAL AND OFFICIAL COMMUNICATION

- Letter-writing
- Email Etiquette
- Reports
- Resume writing

UNIT –V: GRAMMAR- ADVANCED LEVEL

- Relative clauses
- Subject-verb Agreement
- Prepositions
- Common errors

VOCABULARY- ADVANCED LEVEL

- Collocations
- Phrasal verbs
- Idioms
- Adjectives for descriptions

SECTION –II
Technical Skills (35 Marks)

UNIT-I: Review of C++ Language Fundamentals

UNIT-II: Object Oriented Concepts of C++: Classes, Objects, Polymorphism–Static & Dynamic; Operator and Function Overloading; Inheritance – types; Exception handling; Function; Class Templates; Dynamic binding;

UNIT-III: Implementation of Data Structure Algorithms in C++: Singly and Doubly Linked List algorithms using Classes and other OOPs Concepts

UNIT-IV: Mini project work/ Case Study/Assignment using C++

Learning Resources:

1. "Programming: Principles and Practice using C++ (Second Edition)" Addison-Wesley 2014.
2. C++ How To Program (currently in its 4th edition) by Deitel and Deitel
3. Data Structures and Algorithms" by Alfred V. Aho (Author), Jeffrey D. Ullman (Author), John E. Hopcroft (Author)

SYLLABUS FOR BE II/IV -II SEMESTER
ELECTRONICS CIRCUITS LAB

Instructions : 3 Periods / Week	Sem Exam Marks : 50	Subject Reference Code : **EC 2411**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam : 3Hrs.

Course Objective:	Course Outcomes
To develop an understanding of the underlying concepts of analog electronic circuits, wave shaping circuits and low pass/high pass filters.	**students should be able to:** • Design different types of clippers, clampers and multi-vibrators • Analyze the circuit behavior with and without feedback • Distinguish between symmetrical and asymmetrical networks and also between T and π section filters

List of Experiments:

1. Frequency response of single stage and two stage RC-Coupled amplifier using BJT.
2. Frequency response of single stage and two stage RC-Coupled amplifier using FET .
3. Clipping and Clamping Circuits
4. Measurement of Image impedance and characteristic impedance
5. Frequency response of Voltage series feedback amplifier
6. Frequency response of Current Shunt feedback amplifier
7. Bistable Multivibrator, Schmitt trigger
8. Astable Multivibrator and Voltage to frequency Converter
9. Monostable Multivibrator
10. Design and verification of constant K- LPF (Frequency response)
11. Design and verification of m-derived- HPF (Frequency response)
12. Design and verification of L type matching network
13. Design of Oscillators: RC Phase Shift , Hartley, Colpitts
14. Design of tuned Amplifier
15. Design of Power amplifiers : Class – A and Class – B

Learning Resources:

4. Robert Diffenderfer, "Electronic Devices Systems and Applications", Cengage Learning India Private Limited, 2010.
5. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text - Lab Manual", 7thEdition, TMH 2001.

SYLLABUS FOR BE II/IV -II SEMESTER
SIMULATION LAB FOR SIGNALS AND SYSTEMS

Instructions : 3 Periods / Week	Sem Exam Marks : 50	Subject Reference Code : **EC 2421**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam :3Hrs.

Course Objective:	Course Outcomes
To impart the knowledge to write MATLAB codes for the generation of signals, to perform different operations and to verify various transforms for converting time domain signal to frequency domain signal.	**students should be able to:** • Write MATLAB codes for the generation of signals. • Apply Various transforms on signals to find it's Spectrum using MATLAB. • Correlate two signals and can remove noise using correlation. • Find the response of the system using convolution function in MATLAB.

List of Experiments:

1. Basic operations on Matrices
2. Signal Representation.
3. Continuous Systems
4. Convolution Representation
5. Fourier Series
6. The Fourier Transform
7. Mini project-1
8. Frequency domain analysis of Systems
9. Fourier analysis of Discrete time signals and Systems
10. The Laplace transform and the transfer function representation
11. System analysis using the transfer function
12. State space and linear systems
13. Verification of Sampling theorem
14. Correlation between signals and Systems
15. Mini project -2

Suggested Reading:

1. Taan S. ElAli and Mohammad A. Karim, "Continuous Signals and systems with MATLAB", 2/e, 2009, CRC Press.
2. Edward W.Kamen and Bonnie S. Heck, "Fundamentals of Signals and Systems Using MATLAB", PHI Inc.

SYLLABUS FOR BE II/IV -II SEMESTER
APPLIED ELECTRONICS (For Mechanical Engg)

Instructions : 4+1Periods / Week	Sem Exam Marks : 57	Subject Reference Code : **EC 2280**
Credits : 3	Sessional Marks : 30	Duration of Sem Exam :3Hrs.

Course Objective	Course Outcomes
• The course enables the students to acquire the knowledge of various electronic devices & their applications.	students will able to: • Employ different electronic devices to build electronic circuits such as rectifiers, amplifiers, regulators & oscillators. • Implement digital circuits such as adder & sub- tractors using logic gates. • Convert real time signals into corresponding electrical signals using transducers. • Program 8051 Microcontroller for real-time interfacing applications.

UNIT - I

Semiconductor theory: Energy levels, Intrinsic and extrinsic semiconductors, Mobility, diffusion and drift current, Hall effect.

Diodes - PN junction diodes,. V-I characteristics, dynamic & static resistance, principle of working and V-I characteristics of Zener diode, Working of simple zener voltage regulator, V-I characteristics and applications of SCR and TRIAC. Working and characteristics of UJT.

UNIT - II

Rectifiers & power supplies - block diagram description of a dc power supply, circuit diagram & working of half-wave & full wave rectifier, final equations of V_{rms}, V_{dc}, ripple factor and peak inverse voltage in each case. Principle of working of series inductor and shunt capacitor filters. Photoelectric devices-principle of operations of Photodiode, Phototransistor, Photovoltaic cell, Solar cell & LED.

UNIT - III

Bipolar junction transistors: NPN & PNP transistors, structure, typical doping, working of NPN & PNP transistors. Concepts of common base, common emitter & common collector configurations. Comparison of three configurations with

reference to voltage & current gains, input & output resistances and applications.
Amplifiers & Oscillators: Circuit diagram & working of common emitter amplifier, function of each component in the circuit, need of proper biasing, frequency response, voltage gain and 3dB bandwidth. Concepts of feedback, working principles of oscillators, circuit diagram & working of RC, LC and Crystal oscillators.

UNIT - IV

Integrated circuits: Advantages of ICs, Analog and Digital ICs. Functional block diagram of operational amplifier, ideal operational amplifier, Inverting amplifier, Non inverting amplifier, Summing Amplifier, Differentiator, Integrator and Comparator.
Digital ICs: Boolean Algebra, Logic gates, realization of logic functions. Principle of combinational and sequential logic circuits, Flip-flops.

UNIT - V

Transducers - Resistive and Capacitive transducers, Strain Guage, Thermistor, LVDT.
Micro controllers - Intel 8051 - Architecture, Memory organization, Register banks, Special function registers, Addressing modes. Instruction set of 8051 - Programming examples (addition, subtraction, 8 bit multiplication and 8 bit division, only), Interfacing of 8051 with DC and Stepper motor.

***Learning Resources*:**

1. Jocob Millman, Christos C. Halkias and Satyabrata Jit, Electronics Devices and Circuits, Mc Graw Hill, 3/e., 2010.
2. S.Shalivahnan, N. Suresh Kumar, A Vallavea Raj, Electronics Devices and Circuits TMH, 2003.
3. Rama Kanth A. Gaykward, Op-AMPS and Linear Integrated Circuits EEE, 3/e., 1998.
4. Moris Mano, Digital Design, PHI, 3/e., 2009.
5. Mazidi M.A, Mazidi J.G & Rolin D. Mckinlay, "The 8051 Microcontroller & Embedded Systems using Assembly and C," 2/e, Pearson Education, 2007.

SYLLABUS FOR BE II/IV -II SEMESTER
ELECTRONICS ENGINEERING – II (For EEE)

Instructions : 4+1 Periods / Week	Sem Exam Marks : 70	Subject Reference Code : **EC 2290**
Credits : 2	Sessional Marks : 30	Duration of Sem Exam :3Hrs.

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.	**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.

Learning Resources:

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, TuviaApelewicz Raymond Saccardi, "Electronic Circuits: Discrete and Integrated", TMH, 3rd Edition
6. Roody and Coolen, "Electronic Communications", 4th Edition, Pearson Education, Reprint 2007

SYLLABUS FOR BE II/IV -II SEMESTER
APPLIED ELECTRONICS LAB (for Mechanical Engg)

Instructions : 3 Periods / Week	Sem Exam Marks : 50	Subject Reference Code : **EC 2491**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam :3Hrs.

Course Objective	Course Outcomes
• Lab course enables the students to verify the characteristics of various electronic devices & circuits.	Students will able to: • Identify different electronic components & devices. • Verify Input/output characteristics of active devices and to compute their parameters. • Perform operations such as addition, subtraction, comparison of voltage levels using operational amplifiers • Implement digital adders & sub-tractors using logic gates. • Program 8051 microcontroller for simple 8-bit arithmetic operations & to interface 8051 with external peripherals.

List of Experiments:

1. Characteristics of Semiconductor and Zener diodes
2. CRO Applications
3. Full-wave rectifier with and without filter
4. Zener Voltage Regulator
5. Characteristics of BJT transistor (CB, CE, CC)
6. Feedback amplifier and amplifier without feedback
7. Phase shift oscillator
8. Hartley oscillator & Colpitts Oscillator.
9. Operational Amplifier and it's applications
10. Logic gates and flip flops-verifications
11. Realization of Half and Full adder
12. Characteristics of SCR
13. Arithmetic operations (8 bit) using 8051 Microcontroller
14. Interfacing applications using 8051 Microcontroller

General Note: ***Mini Project cum design exercise***:

a) The students must design, rig-up, and test the circuits wherever possible and should carry out the experiments individually.

This exercise carries sessional marks of 10 out of 25, while the remaining 15 marks are for the remaining lab exercises.

SYLLABUS FOR BE II/IV -II SEMESTER
ELECTRONICS ENGINEERING – II LAB ((For EEE)

Instructions : 3 Periods / Week	Sem Exam Marks : 50	Subject Reference Code : **EC 2501**
Credits : 2	Sessional Marks : 25	Duration of Sem Exam: 3Hrs.

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.	**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 Proposed:

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. 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.

Department of Civil Engineering

SYLLABUS FOR BRIDGE COURSE BE II/IV -I SEMESTER
(w.e.f. the academic year 2015-16)

ENGINEERING MECHANICS

(for All branches of BE II/IV –II SEMESTER)

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, rotatory 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

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

UNIT-II

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

UNIT-III

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

UNIT-IV

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

UNIT-V

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.

Department of Physics

SYLLABUS FOR BRIDGE COURSE BE II/IV - FIRST SEMESTER

Physics of Materials (SECTION-I)

(for All branches of B.E. II/IV-I SEMESTER)

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

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

2. Magnetic Materials

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

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

2. Nano Materials

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 Physic*s,* 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 Mathematics

SYLLABUS FOR BRIDGE COURSE BE II/IV -II SEMESTER

Mathematics (SECTION-II)

(for All branches of B.E. II/IV-I SEMESTER)

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

Course Objectives	Course Outcomes
• To understand the statistical concepts measures of central tendency, the addition and multiplication theorems of probability , discrete random variable • To practice the integration by substitution, integration by parts, multiple integrals problems • To understand the concepts of on the applications of integration to find areas, surface areas, volume of solid of revolution	• The student is able to understand the statistical concepts measures of central tendency, the addition and multiplication theorems of probability, discrete random variable • The Student is able to solve the problems on integration by substitution, integration by parts and multiple integrals • The student is able to understand the concepts on the applications of integration to find areas, surface areas, volume of solid of revolution

Unit -I

Basics of Statistics & Probability: Measures of central tendency (Mean, Median & Mode) - Definition of Probability –Basic problems of Probability- Addition & Multiplication theorems- Discrete random variable

Unit -II

Integral Calculus: Methods of integration (Integration by substitution and integration by parts)-Multiple Integrals - Applications of Integration - areas - Surface areas - Volume of solid of revolution

LEARNING RESOURCES:

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

Department of Computer Science & Engineering

SYLLABUS FOR BRIDGE COURSE BE II/IV-I SEMESTER

C-PROGRAMMING LAB

(for All branches of B.E.II/IV -I SEMESTER)

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

1. Finding roots of quadratic equation
2. Check whether a given number is (i) Prime (ii) Perfect (iii) 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

SYLLABUS FOR BRIDGE COURSE BE II/IV-II SEMESTER

ELT-LAB

(for All branches of B.E.II/IV-II SEMESTER)

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

Course objectives	**Course Outcomes** *Student should be able*
• 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.