



# SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Sree Sainath Nagar, A.Rangampet, Near Tirupati - 517 102. A.P.

## ELECTRONICS AND COMMUNICATION ENGINEERING (For the batches admitted from 2010-2011)

### II B. Tech. – I Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT3BS03	Special Functions and Complex Analysis	4	1	-	4	30	70	100
10BT30401	Semiconductor Devices and Circuits	4	1	-	4	30	70	100
10BT30223	Circuit Theory	4	1	-	4	30	70	100
10BT3BS02	Environmental Sciences	4	1	-	4	30	70	100
10BT30402	Probability Theory and Stochastic Processes	4	1	-	4	30	70	100
10BT30403	Signals and Systems	4	1	-	4	30	70	100
10BT30411	Semiconductor Devices and Circuits Lab	-	-	3	2	25	50	75
10BT30412	Simulation Lab	-	-	3	2	25	50	75
<b>Total</b>		<b>24</b>	<b>6</b>	<b>6</b>	<b>28</b>	<b>230</b>	<b>520</b>	<b>750</b>

### II B. Tech. – II Semester

Code	Subject	Periods per weeks			C	Scheme of Examination Max. Marks		
		L	T	P		Int.	Ext.	Total
10BT40401	Electronic Circuit Analysis	4	-	-	4	30	70	100
10BT41301	Control Systems	4	1	-	4	30	70	100
10BT40402	Pulse and Digital Circuits	4	-	-	4	30	70	100
10BT40403	Electromagnetic Waves and Transmission Lines	4	1	-	4	30	70	100
10BT40404	Switching Theory and Logic Design	4	-	-	4	30	70	100
10BT40221	Principles of Electrical Engineering	4	1	-	4	30	70	100
10BT40411	Electronic Circuits Lab	-	-	3	2	25	50	75
10BT40231	Electrical Engineering Lab	-	-	3	2	25	50	75
10BT4HS02	Advanced English Communication Skills (Audit Course)	-	3	-	-	-	-	-
<b>Total</b>		<b>24</b>	<b>6</b>	<b>6</b>	<b>28</b>	<b>230</b>	<b>520</b>	<b>750</b>

HOD, ECE

## II B.Tech. I Semester

### 10BT3BS03: SPECIAL FUNCTIONS AND COMPLEX ANALYSIS

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

#### UNIT-I: PARTIAL DIFFERENTIAL EQUATIONS

Formation of Partial differential equations, Solutions of first order Partial Differential Equations using Lagrange's method. Method of separation of variables - solutions of one dimensional wave equation - Heat equation- Two dimensional Laplace equation under boundary conditions.

#### UNIT-II: SPECIAL FUNCTIONS

Euler's Integrals - Beta and Gamma functions - properties - Relationship between beta and gamma functions- applications - evaluation of improper integrals using Beta and Gamma functions

**BESSEL FUNCTION:** Generating function-properties of Bessel functions - recurrence relations- Orthogonality.

#### UNIT-III: LIMITS AND CONTINUITY - ANALYTIC FUNCTIONS

Exponential, Trigonometric, logarithmic, Hyperbolic and general power ( $Z^c$ ) - separation of real and imaginary parts - Limits and Continuity of functions. Differentiability - Analyticity - Cauchy Riemann equations- conjugate and harmonic conjugate functions - Milne Thompson method- potential functions.

#### UNIT-IV: COMPLEX INTEGRATION

Line integral - evaluation of line integrals along curves and closed contours - Cauchy's Integral theorem - Cauchy's integral formula - Derivatives of analytic function - generalized integral formula- Evaluation of integrals using integral formula.

#### UNIT-V: COMPLEX POWER SERIES

Taylor theorem (with proof) - Laurent's theorem (without proof) - Taylor and Laurent series expansions of complex functions - Singularities - types - residues - poles of order m.

#### UNIT-VI: RESIDUE CALCULUS

Residue theorem - proof - applications - evaluation of integrals using residue theorem - evaluation of improper and real integrals of the type

$$(i) \int_{-\infty}^{\infty} f(x)dx \quad (ii) \int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta \quad (iii) \int_{-\infty}^{\infty} e^{imx} f(x)dx$$

#### UNIT-VII: ROUCHE'S THEOREM - APPLICATIONS

Argument principle - Rouché's theorem - determination of number of zeros of complex polynomials - maximum modulus principle - Fundamental theorem of Algebra - Cauchy's inequality - Liouville's theorem.

#### UNIT-VIII: CONFORMAL MAPPING

Definitions and examples, Mappings defined by  $w = ez$ ,  $\ln z$ ,  $z^2$ ,  $\sin z$ ,  $\cos z$ . Translation, Rotation, Inversion and Bilinear transformation - properties - fixed point - cross ratio - invariance of circles under bilinear transformation - determination of bilinear transformation using three given points.

#### TEXT BOOKS:

1. T.K.V. Iyenger, B. Krishna Gandhi, S.Ranganatham and M.V.S.S.N. Prasad, *Mathematical Methods*, 5<sup>th</sup> Revised Edition, S. Chand & Company, 2010.
2. T.K.V. Iyenger, B. Krishna Gandhi..et al., *Text book of Engineering Mathematics*, Vol-III, 8<sup>th</sup> Edition, S. Chand & Company, 2011.

#### REFERENCE BOOKS:

1. Grewal, B.S., *Higher engineering Mathematics*, 36<sup>th</sup> Edition, Khanna Publishers, Delhi.
2. Kreyszig, E., *Advanced Engineering Mathematics*, 8<sup>th</sup> Edition, John-Wiley.

## 10BT30401: SEMICONDUCTOR DEVICES AND CIRCUITS

(Common to ECE, EEE, EIE & EConE)

L	T	P	C
4	1	-	4

### UNIT-I: PN JUNCTION DIODE

PN Junction Diode Equation, Volt-Ampere (V-I) Characteristics, Temperature Dependence of V-I Characteristics, Ideal Versus Practical, Static and Dynamic Resistances, Diode Equivalent circuits, Junction capacitances, Break down Mechanisms in semiconductor Diodes, Zener Diode Characteristics.

### UNIT-II: RECTIFIERS, FILTERS AND REGULATORS

Halfwave rectifier and fullwave rectifiers (Qualitative and quantitative analysis), Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L - section filter,  $\pi$  - section filter, comparison of various filter circuits in terms of ripple factors. Simple circuit of a regulator using Zener diode. Problems on rectifier circuits.

### UNIT-III: BIPOLAR JUNCTION TRANSISTOR

Transistor construction, BJT Operation, Transistor as an amplifier, Transistor currents and their relations, Input & Output Characteristics of a Transistor in Common Emitter, Common Base and Common Collector Configurations, BJT specifications.

### UNIT-IV: TRANSISTOR BIASING AND STABILIZATION

Operating Point, DC and AC Load Lines, Importance of Biasing, Fixed Bias, Emitter Feedback Bias, Collector to Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization against Variations in  $V_{BE}$  and  $\beta$ , Bias Compensation using Diodes and Transistors, Thermal Runaway, Condition for Thermal Stability in CE configuration, Problems on biasing circuits.

### UNIT-V: SMALL SIGNAL ANALYSIS OF BJT AMPLIFIERS

BJT Modeling, Hybrid Modeling, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Analysis of CE, CB and CC configurations using h-Parameters, Comparison of CB, CE and CC configurations, Simplified Hybrid Model, Millers Theorem, Dual of Millers Theorem.

### UNIT-VI: FIELD EFFECT TRANSISTOR

Construction, Principle of Operation and Characteristics of JFET and MOSFET (Enhancement & Depletion), Small Signal Model of JFET & MOSFET.

### UNIT-VII: FET AMPLIFIERS

Common Source and Common Drain Amplifiers using FET, Generalized FET Amplifier, Biasing of FET, FET as Voltage Variable Resistor, Comparison between BJT and FET.

### UNIT-VIII: SPECIAL PURPOSE ELECTRONIC DEVICES

Principle of Operation and Characteristics of Tunnel Diode, Uni-Junction Transistor (UJT), Varactor Diode, Silicon Control Rectifier (SCR). Principle of operation of Schottky Barrier Diode.

### TEXT BOOKS:

1. J. Millman, Christos C. Halkias, *Electronic Devices and Circuits*, 1991 Edition, TMH, 2008.
2. R.L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits*, 9<sup>th</sup> Edition, PHI, 2006.
3. David A. Bell, *Electronic Devices and Circuits*, 5<sup>th</sup> Edition, Oxford University press, 2008.

### REFERENCE BOOKS:

1. J. Millman and C.C. Halkias, *Integrated electronic*, TMH, 2<sup>nd</sup> Edition, 1998.
2. K. Lal Kishore, *Electronic Devices and Circuits*, 2<sup>nd</sup> Edition, BSP, 2005.
3. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7<sup>th</sup> Edition, PHI, 2005.
4. S. Salivahana, N. Suresh Kumar, A. Vallavaraj, *Electronic Devices and Circuits*, 2<sup>nd</sup> Edition, TMH, 2008.
5. Henry and Jeager, *Semiconductor Devices and Circuits*, Mc-Graw Hill.

**II B.Tech. I Semester**  
**10BT30223: CIRCUIT THEORY**  
**(Common to ECE, EIE & EConE)**

L	T	P	C
4	1	-	4

**UNIT-I: FUNDAMENTALS OF ELECTRICAL CIRCUITS**

Concepts of charge, current, voltage and power, active & passive elements, reference concepts of direction for voltages & currents, voltage and current relationships for passive elements, Ohm's law, Kirchoff Laws, current division and voltage division rules, network reduction techniques, series, parallel, series-parallel circuits, star-delta and delta-star transformations, source transformation.

**UNIT-II: BASIC NODAL & MESH ANALYSIS**

Basic definitions: node, path, loop, branch, nodal analysis and super node concept, mesh analysis and super mesh concept - problems.

**UNIT-III: FUNDAMENTALS OF AC CIRCUITS**

Introduction - advantages of AC supply, types of waveforms, importance of sinusoidal waveforms, basic definitions: waveform, cycle, time period, frequency, amplitude, determination of average and RMS value, form factor & peak factor for different alternating waveforms, phase and phase difference.

**UNIT-IV: SINGLE PHASE AC CIRCUITS**

Sinusoidal response of R, L, C and combination of R, L, C circuits, concept of impedance and power triangles, power factor, resonance, bandwidth and quality factor for series and parallel networks, locus diagram.

**UNIT-V: TRANSIENT ANALYSIS**

Introduction - transient response of RL, RC and RLC for DC excitation, transient response of RL, RC and RLC for sinusoidal excitation, numerical problems.

**UNIT-VI: MAGNETICALLY COUPLED CIRCUITS**

Coupled circuits, self & mutual inductance, DOT conventions, coefficient of coupling, analysis of magnetic circuits: series, parallel and composite, comparison of electrical and magnetic circuits.

**UNIT-VII: NETWORK THEOREMS - I**

Thevenin's, Norton's, Maximum power transfer and Superposition theorems for DC and sinusoidal excitations - applications.

**UNIT-VIII: NETWORK THEOREMS - II**

Tellegen's, Millman's, Reciprocity, Substitution and Compensation theorems for DC and sinusoidal excitation - applications.

**TEXT BOOKS:**

1. A. Sudhakar & Shyam Mohan, *Electric Circuits*, TMH, 3<sup>rd</sup> Edition, 2007.
2. A. Chakrabarathi, *Circuits Theory*, Dhanpat Rai & Co, New Delhi, 2009.

**REFERENCE BOOKS:**

1. M.E. Van Valkenberg, *Network Analysis*, Pearson Publications, 3<sup>rd</sup> Edition, New Delhi 2006.
2. William H.Hayt & Jack E.Kennedy & Steven M. Durbin, *Engineering Circuit Analysis*, 6<sup>th</sup> Edition, TMH, 2009.
3. J.A. Edminister & M.D.Nahvy, *Theory and Problems of Electric Circuits*, Schaums Outline Series, 4<sup>th</sup> Edition, TMH, 2004.
4. G. K. Mittal, Ravi Mittal, *Network Analysis*, Khanna Publishers, 14<sup>th</sup> Edition, New Delhi, 1997.
5. C. K. Alexander and M. N. O. Sadiku, *Fundamentals of Electric Circuits*, 3<sup>rd</sup> Edition, TMH, 2010.

**II B.Tech. I Semester**  
**10BT3BS02: ENVIRONMENTAL SCIENCES**  
**(Common to BOT & ECE)**

L	T	P	C
4	1	-	4

**UNIT-I: INTRODUCTION TO ENVIRONMENTAL SCIENCES**

Definition and concept of the term environment – Various components of environment – Abiotic and biotic – Atmosphere – Hydrosphere – Lithosphere – Biosphere – Inter relationships – Need for public awareness – Role of important national and international individuals and organizations in promoting environmentalism.

**UNIT-II: NATURAL RESOURCES, CONSERVATION AND MANAGEMENT**

Renewable and Non renewable resources and associated problems – Forests: Deforestation, Causes, effects and remedies – Effects of mining, dams and river valley projects – case studies; Water resources: Water use and over exploitation – Conflicts over water – Large dams – benefits and problems; Food resources : World food problems – Adverse effects of modern agriculture – Fertilizer and pesticide problems; Land resources: Land degradation – Land slides- Soil erosion – desertification- water logging – salinity – Causes, effects and remedies; Mineral resources: Mining – Adverse effects; Energy resources: Growing needs – Renewable and Non renewable resources – Alternate resources: Coal, Wind, Oil, Tidal wave, Natural gas, Biomass and Biogas, Nuclear energy, Hydrogen fuel and Solar energy - Impact on environment - Sustainable life styles.

**UNIT-III: ECOLOGY AND ECOSYSTEMS**

Definitions and concepts – Characteristics of ecosystem – Structural and functional features – Producers, consumers and decomposers and food webs – Types of ecosystems – Forests grassland, desert, crop land, pond, lake, river and marine ecosystems – Energy flow in the ecosystem – Ecological pyramids – Ecological successions.

**UNIT-IV: BIO DIVERSITY, CONSERVATION AND MANAGEMENT**

Introduction – Definition and concept of biodiversity – Value of biodiversity – Role of biodiversity in addressing new millennium challenges – Global, national biodiversity – Hot spots of biodiversity – Threats to biodiversity – Man and wild life conflicts – Remedial measures – Endemic, endangered and extinct species – In-situ and ex-situ conservation of biodiversity.

**UNIT-V: ENVIRONMENTAL POLLUTION AND CONTROL**

Definition, causes, adverse effects and control measures of air pollution, indoor pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear pollution – Solid waste management – Causes, effects, control and disposal methods – Role of individuals in the prevention of pollution – Hazards and disaster management – Floods – Earthquakes – Tsunamis – Cyclones – Land slides – Case studies.

**UNIT-VI: SOCIAL ISSUES AND THE ENVIRONMENT**

Concept of sustainable development – Methods of rainwater harvesting – Watershed management – Waste land reclamation – Green cover – Green power – Green technology – Resettlement and rehabilitation of people and related problems – Case studies – Issues and possible solutions - Greenhouse effect and global warming – Carbon credits – Acid rains – Ozone layer depletion – Causes, effects and remedies – Consumerism and waste production – Environment protection acts – Air act – Water act – Forest conservation act – Wild life protection act – Issues involved in the enforcement.

**UNIT-VII: HUMAN POPULATION AND ENVIRONMENT**

Population growth and its impact on environment – Environmental ethics – Family welfare programmes – Human health: T.B., Cancer, HIV/AIDS – Causes, effects and remedies – Occupational health hazards – Human rights – Important international protocols and conventions on environment.

**UNIT-VIII: FIELD WORK/ENVIRONMENTALIST'S DIARY/ASSIGNMENTS/SEMINARS**

**TEXT BOOKS:**

1. Erach Barucha, *Environmental Studies*, 1<sup>st</sup> Edition, Universities Press, Hyderabad, 2010.
2. A. Kaushik and Kaushik, *Environmental Studies*, 3<sup>rd</sup> Edition, New Age International Publishers, 2011.

**REFERENCE BOOKS:**

1. Desh wal, *Environmental Studies*, 2<sup>nd</sup> Edition, Khanna Publicaions, New Delhi, 2010.
2. Rajagopalan, *Environmental Studies*, 1<sup>st</sup> Edition, Oxford University Press, 2009.
3. Joseph Benny, *Environmental Studies*, 2<sup>nd</sup> Edition, TMH, 2010.

## II B.Tech. I Semester

### 10BT30402: PROBABILITY THEORY AND STOCHASTIC PROCESSES

L	T	P	C
4	1	-	4

#### UNIT-I: PROBABILITY

Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayes' Theorem, Independent Events.

#### UNIT-II: THE RANDOM VARIABLE

Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties.

#### UNIT-III: OPERATION ON SINGLE RANDOM VARIABLE

**EXPECTATIONS:** Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function.

**TRANSFORMATIONS OF A RANDOM VARIABLE:** Monotonic Transformations for a Continuous Random Variable, Nonmonotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable.

#### UNIT-IV: MULTIPLE RANDOM VARIABLES

Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density – Point Conditioning, Conditional Distribution and Density – Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, (Proof not expected). Unequal Distribution, Equal Distributions.

#### UNIT-V: OPERATIONS ON MULTIPLE RANDOM VARIABLES

Expected Value of a Function of Random Variables: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

#### UNIT-VI: STOCHASTIC PROCESSES

Concept of Stochastic process, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationarity and Statistical Independence, First-Order Stationary Processes, Second- Order and Wide-Sense Stationarity, Nth-Order and Strict-Sense Stationarity.

#### UNIT-VII: STOCHASTIC PROCESSES – TEMPORAL CHARACTERISTICS

Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance and its properties, Linear system response of Mean and mean-squared value, Autocorrelation function, Cross-correlation functions, Gaussian Random Processes, Poisson Random Process.

#### UNIT-VIII: STOCHASTIC PROCESSES – SPECTRAL CHARACTERISTICS

The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation function.

**SPECTRAL CHARACTERISTICS OF SYSTEM RESPONSE:** Power density spectrum of response, Cross-power spectral density of input and output of a linear system.

**TEXT BOOKS:**

1. Peyton Z. Peebles, *Probability, Random Variables & Random Signal Principles*, 4<sup>th</sup> Edition, TMH, 2001.
2. Athanasios Papoulis and S. Unnikrishna Pillai, *Probability, Random Variables and Stochastic Processes*, 4<sup>th</sup> Edition, PHI, 2002.

**REFERENCE BOOKS:**

1. George R. Cooper, Clave D. MC Gillem, *Probability Methods of Signal and System Analysis*, 3<sup>rd</sup> Edition, Oxford University Press, 1999.
2. Henry Stark and John W. Woods, *Probability and Random Processes with Application to Signal Processing*, 3<sup>rd</sup> Edition, Pearson Education, 2002.
3. S.P. Eugene Xavier, *Statistical Theory of Communication*, 1<sup>st</sup> Edition, New Age Publications, 2003.

**II B.Tech. I Semester**  
**10BT30403: SIGNALS AND SYSTEMS**  
**(Common to ECE, EIE & EConE)**

L	T	P	C
4	1	-	4

**UNIT-I: SIGNAL ANALYSIS**

Signal definition, classification of signals, basic operations on signals, Analogy between vectors and signals, Orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, Closed or complete set of orthogonal functions, Orthogonality in complex functions, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

**UNIT-II: FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS**

Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum.

**UNIT-III: FOURIER TRANSFORMS**

Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

**UNIT-IV: SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS**

System definition, classification of systems, Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

**UNIT-V: CONVOLUTION AND CORRELATION OF SIGNALS**

Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function. Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

**UNIT-VI: LAPLACE TRANSFORMS**

Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

**UNIT-VII: SAMPLING**

Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.

**UNIT-VIII: Z-TRANSFORMS**

Discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time using complex exponential signal, Concept of Z- Transform of a discrete sequence. Distinction between Laplace, Fourier and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms.

**TEXT BOOKS:**

1. B.P. Lathi, *Signals, Systems & Communications*, BS Publications, 2003.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, *Signals and Systems*, 2<sup>nd</sup> Edition, PHI.
3. Simon Haykin and Van Veen, *Signals & Systems*, 2<sup>nd</sup> Edition, Wiley.

**REFERENCE BOOKS:**

1. M.E. Van Valkenburg, *Network Analysis*, 3<sup>rd</sup> Edition, PHI, 2000.
2. Michel J. Robert, *Fundamentals of Signals and Systems*, McGraw-Hill, International Edition, 2008.
3. C. L. Philips, J.M.Parr and Eve A.Riskin, *Signals, Systems and Transforms*, 3<sup>rd</sup> Edition, Pearson Education, 2004.

II B.Tech. I Semester

**10BT30411: SEMICONDUCTOR DEVICES AND CIRCUITS LAB**

(Common to ECE, EIE & EConE)

L	T	P	C
-	-	3	2

**PART A:** (Only for viva voce Examination)

**ELECTRONIC WORKSHOP PRACTICE** (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCBs.
2. Identification, Specifications and Testing of Active Devices, Diodes: BJTs, Low-power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
3. Study and operation of
  - Multimeters (Analog and Digital)
  - Function Generator
  - Regulated Power Supplies
  - CRO.

**PART B:** (Minimum of 10 experiments to be conducted)

1. Forward and Reverse bias characteristics of PN Junction diode
2. Zener diode characteristics and Zener as Voltage Regulator.
3. Input and Output characteristics of Transistor in CB Configuration.
4. Input and Output characteristics of Transistor in CE Configuration
5. Halfwave Rectifier with and without filters.
6. Fullwave Rectifier with and without filters.
7. FET characteristics
8. Measurement of h parameters of transistor in CE configurations
9. Frequency response of CE Amplifier.
10. Frequency response of CC Amplifier.
11. Frequency response of Common Source FET Amplifier.
12. SCR Characteristics.
13. UJT Characteristics.

**II B.Tech. I Semester**  
**10BT30412: SIMULATION LAB**  
**(Common to ECE, EIE & EConE)**

L	T	P	C
-	-	3	2

**List of Experiments:**

1. Basic Operations on Matrices
2. Generation of Various signals and Sequences (Periodic and Aperiodic), Such as Unit Impulse, Unit Step, Square, Saw Tooth, Triangular, Sinusoidal, Ramp, Sinc function.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd Parts of Signal or Sequence and Real and Imaginary Parts of Signal.
5. Convolution between Signals and Sequences.
6. Autocorrelation and Cross correlation between Signals and Sequences.
7. Verification of Linearity and Time Invariance Properties of a Given Continuous / Discrete System.
8. Computation of Unit Sample, Unit Step and Sinusoidal Responses of the Given LTI System and Verifying its Physical Realizability and Stability Properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given Signal and plotting its Magnitude and Phase Spectrum.
11. Waveform Synthesis using Laplace Transform.
12. Locating Zeros and Poles, and plotting the Pole-Zero maps in S-Plane and Z-Plane for the given Transfer Functions.
13. Generation of Gaussian Noise (Real and Complex), Computation of its Mean, M.S. Values and its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Sampling Theorem Verification.
15. Removal of Noise by Auto Correlation / Cross correlation in a given signal corrupted by noise.
16. Impulse response of a raised cosine filter.
17. Verification of Weiner-Khinchine Relations.
18. Checking a Random Process for Stationary in Wide Sense.

## II B.Tech. II Semester

### 10BT40401: ELECTRONIC CIRCUIT ANALYSIS

(Common to ECE, EIE & EConE)

L	T	P	C
4	-	-	4

#### UNIT-I: SINGLE STAGE AMPLIFIERS

Classification of Amplifiers – Distortion in amplifiers, Analysis of CE, CC & CB Configurations with simplified hybrid model, Analysis of CE amplifier with Emitter Resistance and Emitter Follower, Design of single stage RC Coupled Amplifier Using BJT.

#### UNIT-II: MULTI STAGE AMPLIFIERS

Analysis of Cascaded RC Coupled BJT Amplifiers, Cascade Amplifier, Darlington Pair, Different Coupling Schemes used in Amplifiers – RC Coupled Amplifier, Direct and Transformer Coupled Amplifiers.

#### UNIT-III: BJT FREQUENCY RESPONSE

Logarithms, Decibels, General Frequency Considerations, Frequency Response of BJT Amplifier, Analysis at Low and High Frequencies, Effect of Coupling and Bypass Capacitors, The Hybrid –Pi, Common Emitter Transistor Model, CE Short Circuit Current Gain, Current Gain with Resistive Load, Single Stage CE Transistor Amplifier Response, Gain – Bandwidth product, Emitter Follower at Higher Frequencies.

#### UNIT-IV: MOSFET AMPLIFIERS

Basic Concepts, MOSFET Small Signal Model, Common Source Amplifier with Resistive Load, Diode Connected Load and Current Source Load, Source Follower, Common gate stage cascade and folded cascade amplifier and their Frequency Response.

#### UNIT-V: FEEDBACK AMPLIFIERS

Classification of Amplifiers, Concepts of Feedback, Classification of Feedback Amplifiers, General Characteristics of Negative Feedback Amplifiers, Effect of feedback on Amplifier Characteristics, Voltage Series, voltage Shunt, Current series and Current Shunt Feedback Configurations, Illustrative Problems.

#### UNIT-VI: OSCILLATORS

Conditions for oscillations, RC and LC Type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized Analysis of LC Oscillators, Quartz, Hartley and Colpitts Oscillators, RC-Phase Shift and Wien-Bridge Oscillators.

#### UNIT-VII: LARGE SIGNAL AMPLIFIERS

Class A Power Amplifier, Maximum Value of Efficiency of Class-A Amplifier, Transformer Coupled Amplifier, Transformer Coupled Audio Amplifier, Push Pull Amplifier - Complimentary Symmetry, Class - B Power Amplifier, Phase Inverters, Transistor power Dissipation.

#### UNIT-VIII: TUNED AMPLIFIERS

Introduction, Q-Factor, Small Signal Tuned Amplifiers, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Cascading Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

#### TEXT BOOKS:

1. Jacob Millman and Christos C. Halkias, *Integrated Electronics*, McGraw-Hill.
2. Robert L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits Theory*, 9<sup>th</sup> Edition, PE, 2008.
3. David A. Bell, *Electronic Devices and Circuits*, 5<sup>th</sup> Edition, Oxford University Press.
4. Behzad Razavi, *Design of Analog CMOS Integrated Circuits*, TMS, 2008.

#### REFERENCE BOOKS:

1. Donald A. Neaman, *Electronic Circuit Analysis and Design*, 3<sup>rd</sup> Edition, TMH, 2007.
2. Robert T. Paynter, *Introductory Electronic Devices and Circuits*, 7<sup>th</sup> Edition, PEI, 2009.
3. Sedra/Smith, *Micro Electronic Circuits*, 5<sup>th</sup> Edition, Oxford University Press, 2009.
4. K. Lal Kishore, *Electronic Circuit Analysis*, BSP, 2004.
5. S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, *Electronic Devices and Circuits*, 2<sup>nd</sup> Edition, TMH, 2009.

**II B.Tech. II Semester**  
**10BT41301: CONTROL SYSTEMS**  
**(Common to ECE, EEE, EIE & EConE)**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>4</b>	<b>1</b>	<b>-</b>	<b>4</b>

**UNIT I: INTRODUCTION**

Concepts of Control Systems, Open Loop and closed loop control systems, Feed-Back Characteristics, Effects of feedback, Block diagram representation of physical systems, Mathematical models-differential Equations.

**UNIT II: TRANSFER FUNCTION REPRESENTATION**

Analogous systems, electrical analogy of physical systems, Derivation of transfer function, Transfer function of DC Servomotor, Synchro transmitter and receiver, Block diagram algebra, Signal Flow graph and Mason's gain formula.

**UNIT III: TIME RESPONSE ANALYSIS**

Types of test signals, Response of first and second order system, Time domain specifications, type and order of systems, steady state error, static error constants, generalized error co-efficients. Effect of P, PI, PID on time response.

**UNIT IV: STABILITY ANALYSIS IN S-DOMAIN**

Concepts of stability: Characteristic equation, location of roots in s-plane for stability, asymptotic stability and relative stability, Routh-Hurwitz stability criterion.

**ROOT LOCUS TECHNIQUE:** Root locus concept, construction of root loci, effects of adding poles and zeros to  $G(s)H(s)$  on the root loci.

**UNIT V: FREQUENCY RESPONSE ANALYSIS**

Introduction, Frequency domain specifications, Bode diagrams, Determination of Frequency domain specifications and transfer function from the Bode Diagram, Phase margin and Gain margin, Stability Analysis from Bode Plots.

**UNIT VI: STABILITY ANALYSIS IN FREQUENCY DOMAIN**

Polar Plots, Nyquist plots, stability in frequency domain using Nyquist stability criterion, simple problems.

**UNIT VII: DESIGN AND COMPENSATION OF CONTROL SYSTEMS**

Introduction to Compensation networks, Lag, Lead, lead-lag compensation, Compensation using Bode plots.

**UNIT VIII: STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS** Concepts of state, state variables and state model, derivation of state model for physical systems Diagonalization, State Transition Matrix and its Properties, Solution of linear state equation, Concepts of Controllability and Observability, Kalman's test only.

**TEXT BOOKS:**

1. I. J. Nagrath and M. Gopal, *Control Systems Engineering*, 2<sup>nd</sup> Edition, New Age International (P) Limited.
2. Katsuhiko Ogata, *Modern Control Engineering*, 3<sup>rd</sup> Edition, Prentice Hall of India Pvt. Ltd.

**REFERENCE BOOKS:**

1. B.C.Kuo, *Automatic Control Systems*, Weilly Eastern, 2004.
2. John wiley, *Control Systems Engineering*, 3<sup>rd</sup> Edition, NISE.
3. Richard C. Dorf, Robert H. Bishop, *Modern Control Systems*, 11<sup>th</sup> Edition, Pearson Education, 2007.
4. Graham Goodwin, Stefan Graebe and Mario Salgado, *Control System Design*, Prentice Hall.

**II B.Tech. II Semester**  
**10BT40402: PULSE AND DIGITAL CIRCUITS**  
**(Common to ECE, EIE & EConE)**

L	T	P	C
4	-	-	4

**UNIT-I: LINEAR WAVE SHAPING**

High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. High pass RC network as differentiator and Low pass RC network as integrator, attenuators and its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit. Problem solving.

**UNIT-II: NON-LINEAR WAVE SHAPING**

Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and diode resistances into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Synchronized clamping.

**UNIT-III: SWITCHING CHARACTERISTICS OF DEVICES**

Diode as a switch, piecewise linear diode characteristics, Diode switching times, Transistor as a switch, Break down voltages, transistor in saturation, temperature variations of saturation parameters, Transistor-switching times, Silicon-controlled-switch circuits.

**UNIT-IV: MULTIVIBRATOR CIRCUITS**

Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger Circuit using BJT, Concept of triggering, Symmetrical and asymmetrical configurations.

**UNIT-V: TIME BASE GENERATORS**

General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Transistor Current time base generators, Methods of linearity improvements.

**UNIT-VI: SAMPLING GATES**

Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Four Diode Sampling gate, Reduction of pedestal in gate circuits, Six diode gate, Applications of sampling gates.

**UNIT-VII: SYNCHRONIZATION AND FREQUENCY DIVISION**

Principles of Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit, A Sinusoidal Divider using Regeneration and Modulation.

**UNIT-VIII: REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS**

AND, OR & NOT gates using Diodes & Transistors, DCTL, RTL, DTL, TTL and CMOS Logic families, and Comparison between the logic families.

**TEXT BOOKS:**

1. J. Millman and H. Taub, *Pulse, Digital and Switching Waveforms*, McGraw-Hill, 1991.
2. David A. Bell, *Solid State Pulse circuits*, 4<sup>th</sup> Edition, PHI, 2002.
3. Jacob Milliman, Christors C Halkias, *Integrated Electronics*, 1<sup>st</sup> Edition, TMH, 2004.

**REFERENCE BOOKS:**

1. A. Anand Kumar, *Pulse and Digital Circuits*, 2<sup>nd</sup> Edition, PHI, 2005.
2. L. Strauss, *Wave Generation and Shaping*, 5<sup>th</sup> Edition, TMH, 2010.
3. R.Venkataraman, *Pulse, Digital Circuits and Computer Fundamentals*, 3<sup>rd</sup> Edition, Dhanapat Rai Publications, 2005.

**II B.Tech. II Semester**  
**10BT40403: ELECTROMAGNETIC WAVES AND TRANSMISSION LINES**

L	T	P	C
4	1	-	4

*Review of Coordinate Systems, Vector Calculus.*

**UNIT-I: ELECTROSTATICS-I**

Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, illustrative Problems.

**UNIT-II: ELECTROSTATICS-II**

Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, illustrative Problems.

**UNIT-III: MAGNETOSTATICS**

Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy, illustrative Problems.

**UNIT-IV: MAXWELL'S EQUATIONS (TIME VARYING FIELDS)**

Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements. Conditions at a Boundary Surface: Dielectric-Dielectric and Dielectric-Conductor Interfaces, illustrative Problems.

**UNIT-V: EM WAVE CHARACTERISTICS – I**

Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization, illustrative Problems.

**UNIT-VI: EM WAVE CHARACTERISTICS – II**

Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem – Applications, Power Loss in a Plane Conductor, illustrative Problems.

**UNIT-VII: TRANSMISSION LINES - I**

Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion – Condition for Distortionless and Minimum Attenuation, Loading - Types of Loading, illustrative Problems.

**UNIT-VIII: TRANSMISSION LINES – II**

Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR, UHF Lines as Circuit Elements;  $\lambda/4$ ,  $\lambda/2$ ,  $\lambda/8$  Lines – Impedance Transformations. Significance of  $Z_{\min}$  and  $Z_{\max}$ , Smith Chart – Configuration and Applications, Single and Double Stub Matching, illustrative Problems.

**TEXT BOOKS:**

1. E.C. Jordan and K.G. Balmain, *Electromagnetic Waves and Radiating Systems*, 2<sup>nd</sup> Edition, PHI, 2000.
2. Matthew N.O. Sadiku, *Elements of Electromagnetic*, 3<sup>rd</sup> Edition, Oxford University Press, 2001.

**REFERENCE BOOKS:**

1. William H. Hayt Jr. and John A. Buck, *Engineering Electromagnetics*, 7<sup>th</sup> Edition, TMH, 2006.
2. John D. Ryder, *Networks, Lines and Fields*, 2<sup>nd</sup> Edition, PHI, 1999.
3. Nathan Ida, *Engineering Electromagnetics*, 2<sup>nd</sup> Edition, Springer (India) Pvt. Ltd., New Delhi, 2005.
4. Schaum's Out-lines, *Electromagnetics*, 2<sup>nd</sup> Edition, TMH, 2006.

## II B.Tech. II Semester

### 10BT40404: SWITCHING THEORY AND LOGIC DESIGN

L	T	P	C
4	-	-	4

#### UNIT-I: NUMBER SYSTEMS & CODES

Philosophy of number systems – complement representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes.

#### UNIT-II: BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS

Fundamental postulates of Boolean Algebra, Basic theorems and properties, switching functions, Canonical and Standard forms, algebraic simplification, digital logic gates, properties of XOR gate, universal gates, Multilevel NAND/NOR realizations.

#### UNIT-III: MINIMIZATION OF SWITCHING FUNCTIONS

Map method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicant chart, simplification rules.

#### UNIT-IV: COMBINATIONAL LOGIC DESIGN

Design using conventional logic gates-Binary Adders, Subtractors, Look ahead carry generator, Decimal adder-BCD adder, Binary multiplier, Modular design using IC chips-Magnitude comparator, Encoder, Decoder, Multiplexer- MUX Realization of switching functions, De-Multiplexer, Parity bit generator, Code-converters, Hazards and hazard free realizations.

#### UNIT-V: PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC

Basic PLD's-ROM, PROM, PLA, PAL, Realization of Switching functions using PLD's. Capabilities and limitations of Threshold gate, synthesis of threshold functions, multigate synthesis.

#### UNIT-VI: SEQUENTIAL CIRCUITS - I

Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples), Basic flip-flops, Triggering and excitation tables, Steps in synchronous sequential circuit design, Design of Synchronous counters – modulo-N, up/down counter, ring counter, Johnson counter, Design of Asynchronous counter-modulo-N, Sequence detector, Serial binary adder.

#### UNIT-VII: SEQUENTIAL CIRCUITS - II

Finite state machine-capabilities and limitations, Mealy and Moore models, minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods, concept of minimal cover table.

#### UNIT-VIII: ALGORITHMIC STATE MACHINES

Salient features of the ASM chart, Simple examples, System design using data path and control subsystems, control implementations, examples of Weighing machine and Binary multiplier.

#### TEXT BOOKS:

1. Morris Mano, *Digital Design*, 3<sup>rd</sup> Edition, PHI.
2. Zvi Kohavi, *Switching & Finite Automata theory*, 2<sup>nd</sup> Edition, TMH.

#### REFERENCE BOOKS:

1. Charles H. Roth, *Fundamentals of Logic Design*, 5<sup>th</sup> Edition, Thomson Publications, 2004.
2. Fletcher, *An Engineering Approach to Digital Design*, 1<sup>st</sup> Edition, PHI, 2005.
3. John M. Yarbrough, *Digital Logic Applications and Design*, Thomson Publications, 2006.
4. A Anand Kumar, *Switching Theory and Logic Design*, PHI, 2008.

## II B.Tech. II Semester

### 10BT40221: PRINCIPLES OF ELECTRICAL ENGINEERING (Common to ECE, EIE & EConE)

L	T	P	C
4	1	-	4

#### UNIT-I: TWO PORT NETWORKS

Impedance parameters, admittance parameters, hybrid parameters, transmission (ABCD) parameters, conversion of one parameter to another, conditions for reciprocity and symmetry, interconnection of two port networks in series, parallel and cascaded configurations, image parameters, illustrative problems.

#### UNIT-II: FILTERS

Classification of filters, filter networks, classification of pass band and stop band, characteristic impedance in the pass band & stop bands, constant-k Low pass filter, high pass filter, m-derived T-section, band pass filter and band elimination filter, illustrative problems.

#### UNIT-III: SYMMETRICAL ATTENUATORS

Symmetrical attenuators, T- type attenuator, - type attenuator, bridged T type attenuator, lattice attenuator.

#### UNIT-IV: DC MACHINES

Principle of operation of DC Machines- constructional features, EMF equation, Types of DC machines, Magnetization and load characteristics of DC generators, characteristics of DC motors, losses and efficiency, Swinburne's test, Speed control: flux and armature voltage control of DC shunt motor.

#### UNIT-V: POLY PHASE SYSTEM

Advantages of poly phase system over single phase system - phase sequence - star & delta connections, relationship between phase and line quantities, balanced and unbalanced circuits, power measurement in three phase systems using two wattmeter method - problems.

#### UNIT-VI: TRANSFORMERS AND THEIR PERFORMANCE

Principle of operation of single phase transformer, types , constructional features, phasor diagram on No load and load, equivalent circuit, losses and efficiency of transformer and regulation, OC and SC tests, predetermination of efficiency and regulation (simple problems).

#### UNIT-VII: THREE PHASE INDUCTION MOTORS AND ALTERNATORS

Principle of operation of three phase induction motors, slip ring and squirrel cage motors, alternators: constructional features, principle of operation, types, EMF equation (simple problems).

#### UNIT-VIII: SPECIAL MACHINES

Principle of operation - shaded pole motors, capacitor motors, AC servomotor, AC tachometers, sychros, stepper motor - characteristics.

#### TEXT BOOKS:

1. A. Sudhakar, Shyammohan S. Palli, *Network Analysis*, TMH, 3<sup>rd</sup> Edition, New Delhi, 2009.
2. B.L. Theraja and A.K. Theraja, *A Text Book Electrical Technology*, Vol - 2, S. Chand Company, New Delhi, 2010.

#### REFERENCE BOOKS:

1. John D. Ryder, *Networks, Lines and Fields*, 2<sup>nd</sup> edition, Prentice Hall India, New Delhi, 2009.
2. C.L. Wadhwa, *Network Analysis and Synthesis*, 3<sup>rd</sup> Edition, NewAge International Publishers, 2007.
3. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering*, Oxford University Press, New Delhi, 2005.
4. W.H. Hayt and J.E. Kemmerly and S.M. Durbin, *Engineering Circuits Analysis*, 6<sup>th</sup> Edition, TMH, New Delhi, 2006.
5. M.S. Naidu and S. Kamakshiah, *Introduction to Electrical Engineering*, TMH, 2008.

**II B.Tech. II Semester**  
**10BT40411: ELECTRONIC CIRCUITS LAB**  
**(Common to ECE & EIE)**

L	T	P	C
-	-	3	2

**List of Experiments:** (Minimum of Twelve experiments to be conducted)

**I) Design and Simulation in Simulation Laboratory using Any Simulation Software.**

(Minimum of Six Experiments to be conducted):

1. Common Emitter amplifier
2. Common Source amplifier
3. A Two Stage RC Coupled Amplifier
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascade Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. High Frequency Common base (BJT) / Common gate(JFET) Amplifier.

**II) Testing in the Hardware Laboratory:**

Any Three circuits simulations in Simulation laboratory

Any Three of the following

- Class A Power Amplifier (with transformer load)
- Class C Power Amplifier
- Single Tuned Voltage Amplifier
- Hartley and Colpitt's Oscillators
- Darlington Pair
- MOSFET Amplifier

**II B.Tech. II Semester**  
**10BT40231: ELECTRICAL ENGINEERING LAB**  
**(Common to ECE, EIE & EConE)**

L	T	P	C
-	-	3	2

**Any SIX experiments from each part to be conducted**

**PART - A**

1. Series and parallel resonance - timing, resonant frequency, bandwidth and Q-factor determination for RLC network
2. Time response of first order RL/RC network for periodic non-sinusoidal inputs - time constant and steady state error determination
3. Two port network parameters - Z and Y parameters
4. Two port network parameters - ABCD and h-parameters
5. Verification of Superposition and Reciprocity theorems
6. Verification of maximum power transfer theorem. Verification on both DC and AC
7. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test
8. Constant - k low pass filter and high pass filter - design and test

**PART - B**

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance
2. Swinburne's test on DC shunt machine (Predetermination of efficiency of a given DC shunt machine working as motor and generator)
3. Brake test on DC shunt motor. Determination of performance characteristics
4. Speed control of DC motor by
  - a. Field flux control method
  - b. Armature voltage control method
5. OC and SC tests on single-phase transformer (predetermination of efficiency and regulation at given power factors and determination of equivalent circuit)
6. Load test on single phase transformer
7. Brake test on three-phase induction motor. Determination of performance characteristics

## II B.Tech. II Semester

### 10BT4HSO2: ADVANCED ENGLISH COMMUNICATION SKILLS

(Common to ECE, EIE, EEE, EConE & BOT)

(Audit Course)

L	T	P	C
-	3	-	-

#### UNIT I: VOCABULARY BUILDING

Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases.

**FUNCTIONAL ENGLISH:** starting conversation, responding appropriately and relevantly, using the right body language, role play in different situations.

#### UNIT II: READING COMPREHENSION

Reading for facts, Guessing meanings from context, Scanning, Skimming, Inferring meaning and Critical reading.

#### UNIT III: ACADEMIC ESSAY WRITING

Accuracy, Brevity, Clarity, Brainstorm, List your ideas, Sub-headings, Revising Content and Organisation.

#### UNIT IV: TECHNICAL REPORT WRITING

Types of formats and styles, Subject-matter, Subject-organization, Clarity, Coherence and Style, Planning, Data-collection, Tools, Analysis.

#### UNIT V: CAREER SKILLS

Career direction, Exploring your talents, Personality inventories, Write a "Who I Am" statement, Thinking further, Perform career research, How do I get hired, Creating job satisfaction, Identify your satisfaction triggers, Positive attitude, Maintain a balanced lifestyle, Analyze your job in terms of your interests, Set goals to bring your interests and responsibilities in line, Personal SWOT analysis, Making the most of your talents and opportunities, Shaping your job to fit you better, Future proof your career, Managing your emotions at work, Get the recognition you deserve.

#### UNIT VI: RESUME WRITING

Structure and Presentation, Planning, Defining the career objective, Projecting ones strengths and skill-sets, Summary, Formats and Styles, Cover letter.

#### UNIT VII: GROUP DISCUSSION

Dynamics of group discussion, Intervention, Summarizing, Modulation of voice, Fluency and Coherence, Participation, Relevance, Assertiveness, Eye contact and Body language.

#### UNIT VIII: INTERVIEW SKILLS

Concept and Process, Pre-interview planning, Opening strategies, Answering strategies, Interview through Tele and Video-conferencing.

#### REFERENCE BOOKS:

1. M. Ashraf Rizvi, "Effective Technical Communication Skills", TMH, 2005.
2. Meenakshi Raman and Sangetha Sharma, "Technical Communication, Principles and Practice", Oxford University Press, New Delhi, 2010.
3. Santha Kumar R, "Secrets of Success in Interviews", Crucial Books, Secunderabad, 2007.
4. M. Ashraf Rizvi, "Resumes and Interviews - The Art of Wining". TMH, 2008.
5. Gopala Swamy Ramesh and Mahadevan Ramesh, "The Ace of Soft Skills: Attitude, Communication and Etiquette for Success", Pearson Education, New Delhi, 2009.

#### SUGGESTED SOFTWARE:

1. TOEFL, GRE and IELTS (Kaplan, Aarco and Barrons, Cliffs)
2. Softwares from 'train2success.com'
3. Resume Preparation, K-Van Solutions.
4. Facing Interviews, K-Van Solutions.
5. Study Skills Success, (Essay, Vocabulary strategies, IELTS), Young India Films.
6. Vocabulary Builder, Young India Films.

7. E-correspondence, Young India Films.
8. Group Discussions, (Ease - 2), Young India Films.
9. Report Writer, Young India Films.