



**B.E - ELECTRONICS AND COMMUNICATION ENGINEERING
 (SEVEN SEMESTER PART TIME)
 CURRICULUM 2008**

SEMESTER I

Code No.	Course Title	L	T	P	C
THEORY					
PEC101	Mathematics-I	3	0	0	3
PEC102	Circuit Analysis	3	0	0	3
PEC 103	Electron Devices	3	0	0	3
PEC104	Electronic Circuits-I	3	0	0	3
PRACTICAL					
PEC 105	Electronic Devices and Circuits Lab-I	0	0	3	2

Total Hours: 15

Total Credits : 14

SEMESTER II

Code No.	Course Title	L	T	P	C
THEORY					
PEC 201	Mathematics-II	3	0	0	3
PEC 202	Signals and Systems	3	0	0	3
PEC 203	Electromagnetic Fields	3	0	0	3
PEC 204	Electronic Circuits-II	3	0	0	3
PRACTICAL					
PEC 205	Electronic Circuits-II and Simulation Lab	0	0	3	2

Total Hours: 15

Total Credits : 14

SEMESTER III

Code No.	Course Title	L	T	P	C
THEORY					
PEC 301	Professional Ethics and Human values (ECE)	3	0	0	3
PEC 302	Random Process	3	0	0	3
PEC 303	Linear Integrated Circuits	3	0	0	3
PEC 304	Transmission Lines and wave guides	3	0	0	3
PRACTICAL					
PEC 305	Linear Integrated Circuit Lab	0	0	3	2

Total Hours: 15

Total Credits : 14

SEMESTER IV

Code No.	Course Title	L	T	P	C
THEORY					
PEC 401	Numerical methods	3	0	0	3
PEC 402	Communication Theory	3	0	0	3
PEC 403	Antenna and Wave Propagation	3	0	0	3
PEC 404	Digital Signal Processing	3	0	0	3
PRACTICAL					
PEC 405	Digital Signal Processing Lab	0	0	3	2

Total Hours: 15

Total Credits : 14

SEMESTER V

Code No.	Course Title	L	T	P	C
THEORY					
PEC 501	Microwave Engineering	2	0	1	3
PEC 502	Microprocessor and its Applications	3	0	0	3
PEC 503	Digital Communication	3	0	0	3
PEC 504	Computer Networks	3	0	0	3
PRACTICAL					
PEC 505	RF and Communication Lab	0	0	3	2

Total Hours: 15

Total Credits : 14

SEMESTER VI

Code No.	Course Title	L	T	P	C
THEORY					
PEC 601	Entrepreneurial Development Management	3	0	0	3
PEC 602	VLSI Design	3	0	0	3
PEC 603	Optical Communication	2	0	1	3
PECE**	Elective I	3	0	0	3
PRACTICAL					
PEC605	VLSI Lab	0	0	3	2

Total Hours: 15

Total Credits : 14

SEMESTER VII

Code No.	Course Title	L	T	P	C
THEORY					
PEC701	Social Engineering	3	0	0	3
PECE**	Elective II	3	0	0	3
PECE**	Elective III	3	0	0	3
PRACTICAL					
PEC704	Project Work	0	0	20	12

Total Hours: 29

Total Credits : 21

Overall Credits: 105

LIST OF ELECTIVES

Code No.	Course Title	L	T	P	C
E51	Advanced Microprocessor	3	0	0	3
E52	Medical Electronics	3	0	0	3
E53	Operating Systems	3	0	0	3
E54	Solid State Electronic Devices	3	0	0	3
E55	Speech Processing	3	0	0	3
E56	Object oriented Programming	3	0	0	3
E57	Computer Hardware and Interfacing	3	0	0	3
E58	Internet and Java	3	0	0	3
E59	Mobile Communication	3	0	0	3
E60	Advanced Digital Signal Processing	3	0	0	3
E61	Electromagnetic Interference and Compatibility	3	0	0	3
E62	High Speed Networks	3	0	0	3
E63	Power Electronics	3	0	0	3
E64	Soft Computing	3	0	0	3
E65	RF Circuit Design	3	0	0	3
E66	Digital Image Processing	3	0	0	3
E67	Embedded Systems	3	0	0	3
E68	Wireless networks	3	0	0	3
E69	Telecommunication Switching and Networks	3	0	0	3
E70	Satellite communication	3	0	0	3
E71	Advanced Electronic system design	3	0	0	3
E72	Opto - Electronic devices	3	0	0	3
E73	Telecommunication System Modeling and Simulation	3	0	0	3
E74	Radar and Navigational Aids	3	0	0	3
E75	Remote Sensing	3	0	0	3
E76	Engineering Acoustics	3	0	0	3
E77	Analog Interfacing to Microprocessor Systems	3	0	0	3
E78	Intellectual Property Rights	3	0	0	3
E79	Indian Constitution and Society	3	0	0	3

UNIT I BASIC CIRCUIT CONCEPTS**9**

Lumped circuits: Circuit elements, ideal sources (independent and dependent), linear passive parameters R, L and C; V-I relationship of circuit elements; sinusoidal voltage and current, RMS value, form factor; Kirchoff's Laws; analysis of series and parallel circuits: Network reduction; voltage and current division, source transformation, star/delta transformation.

UNIT II TRANSIENT ANALYSIS OF FIRST & SECOND ORDER CIRCUITS**9**

Source free response of RL and RC circuits; forced (step) response of RL and RC circuits; source free response of RLC series circuit; forced (step) response of RLC series circuit; forced response of RL, RC and RLC series circuit to sinusoidal excitation; time constant and natural frequency of oscillation of circuits. Laplace Transform application to the solution of RL, RC & RLC circuits: Initial and final value theorems and applications, concept of complex frequency, driving point and transfer impedance, poles and zeros of network function.

UNIT III SINUSOIDAL STEADY STATE ANALYSIS**9**

Concept of phasor and complex impedance / admittance; analysis of simple series and parallel circuits: Active power, reactive power, apparent power (volt ampere), power factor and energy associated with these circuits; concept of complex power; phasor diagram, impedance triangle and power triangle associated with these circuits. Resonance in series and parallel circuits: Q factor, half-power frequencies and bandwidth of resonant circuits.

UNIT IV MULTI DIMENSIONAL CIRCUIT ANALYSIS & NETWORK THEOREMS**9**

Node voltage analysis of multi node circuit with current sources, rules for constructing nodal admittance matrix $[Y]$ for solving matrix equation $[Y]V=I$; Mesh-current analysis of multi node circuits with voltage sources, rules for constructing mesh impedance matrix $[Z]$ for solving matrix equation $[Z]I=V$. Super position theorem, Thevenin's theorem, Norton's theorem, Reciprocity theorem, Compensation theorem, Tellegen's theorem, Millman's theorem, maximum power transfer theorem for variable resistance load, variable impedance load and variable resistance and fixed reactance load.

UNIT V COUPLED CIRCUITS AND THREE PHASE CIRCUITS

9

Coupled circuits: mutual inductance, coefficient of coupling, dot convention; analysis of simple coupled circuits. Three phase circuits: three phase balanced / unbalanced voltage sources, symmetrical components, analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads (balanced & unbalanced), phasor diagram of voltages & currents, power and power factor measurements in three phase circuits.

LECTURE 45

TOTAL : 45

TEXT BOOKS

1. William H.Hayt Jr, Jack E.Kemmerly, and Steven M.Durbin, 'Engineering Circuit Analysis', Tata McGraw Hill Publishing Co Ltd, New Delhi, 2002.
2. Joseph A.Edminister, Mahmood Nahvi, 'Electric Circuits', Schaum's Series, Tata McGraw Hill publishing Co. Ltd., New Delhi 2001.

REFERENCE BOOKS

1. R.C. Dorf, 'Introduction to Electric Circuits', John Wiley & Sons Inc, New York, Second Edition, 2003.
2. Charles K.Alexander, Mathew N.O. Sadiku, 'Fundamentals of Electric Circuit', McGraw Hill, N.Y, 2003
3. M.E.Valkenburg, 'Network Analysis', Third Edition, Prentice Hall of India Pvt Ltd, New Delhi 1996

UNIT I: ELECTRON BALLISTICS AND INTRINSIC SEMICONDUCTORS 9

Force on charge in electric field – Motion of Charge in uniform and time varying electric fields – Force on a moving charge in a magnetic field – calculation of cyclotron frequency – calculation of electrostatic and magnetic deflection sensitivity.

Energy band structure of conductors, semiconductors and insulators – Density distribution of available energy states in semiconductors – Fermi-Dirac probability distribution function at different temperatures – Thermal generation of carriers – Calculation of electron and hole densities in intrinsic semiconductors – Intrinsic concentration – Mass Action Law.

UNIT II : EXTRINSIC SEMICONDUCTOR AND PN JUNCTIONS 9

N and P type semiconductors and their energy band structures – Law of electrical neutrality – Calculation of location of Fermi level and free electron and hole densities in extrinsic semiconductors – Mobility, drift current and conductivity – Diffusion current – Continuity equation - Hall effect.

Band structure of PN Junction – Current Component in a PN Junction – Derivation of diode equation – Temperature dependence of diode characteristics.

UNIT III SWITCHING CHARACTERISTICS OF PN JUNCTION AND SPECIAL DIODES 9

Calculation of transition and diffusion capacitance – Varactor diode – charge control description of diode – switching characteristics of diode – Mechanism of avalanche and Zener breakdown – Temperature dependence of breakdown voltages – Backward diode – Tunneling effect in thin barriers Tunnel diode – Photo diode – Light emitting diodes.

UNIT IV BIPOLAR JUNCTION TRANSISTORS AND FIELD EFFECT TRANSISTORS 9

Construction of PNP and NPN transistors – BJT current components – Emitter to collector and base to collector current gains – Base width modulation CB and CE characteristics – Breakdown characteristics – Ebers – Moll model – Transistor switching times.

Construction and Characteristics of JFET – Relation between Pinch off Voltage and drain current – Derivation. MOSFETS – Enhancement and depletion types.

UNIT V METAL SEMICONDUCTOR CONTACTS AND POWER CONTROL DEVICES

9

Metal Semiconductor Contacts - Energy band diagram of metal semiconductor junction Schottky diode and ohmic contacts.

Power control devices: Characteristics and equivalent circuit of UJT - intrinsic stand off ratio. PNP diode – Two transistor model, SCR, Triac, Diac.

LECTURE 45

TOTAL : 45

TEXT BOOK

1. Jacob Millman & Christos C.Halkias, "Electronic Devices and Circuits" Tata McGraw-Hill, 1991 .

REFERENCES

1. Nandita Das Gupta and Amitava Das Gupta, Semiconductor Devices – Modelling and Technology, Prentice Hall of India, 2004.
2. Donald A.Neaman," Semiconductor Physics and Devices" 3rd Ed., Tata McGraw-Hill 2002.
3. S.Salivahanan, N.Sureshkumar and A.Vallavaraj, Electronic Devices and Circuits, TMH, 1998.
4. S.M.Sze, Semiconductor Devices – Physics and Technology, 2nd edn. John Wiley, 2002.
5. Ben G.Streetman and Sanjay Banerjee, Solid State Electronic Devices, Pearson Education 2000.

UNIT I TRANSISTOR BIASING**9**

BJT – Need for biasing - Fixed bias circuit, Load line and quiescent point. Variation of quiescent point due to h_{FE} variation within manufacturers tolerance. Stability factors. Different types of biasing circuits. Method of stabilizing the Q point to the extent possible. Advantage of Self bias (voltage divider bias) over other types of biasing. Use of Self bias circuit as a constant current circuit. Source self bias and voltage divider bias for FET. Use of JFET as a voltage variable resistor.

UNIT II MIDBAND ANALYSIS OF SMALL SIGNAL AMPLIFIERS**9**

CE, CB and CC amplifiers. Method of drawing small-signal equivalent circuit. Midband analysis of various types of single stage amplifiers to obtain gain, input impedance and output impedance. Miller's theorem. Comparison of CB, CE and CC amplifiers and their uses. Darlington connection using similar and Complementary transistors. Methods of increasing input impedance using Darlington connection and bootstrapping. CS, CG and CD (FET) amplifiers. Multistage amplifiers.

Basic emitter coupled differential amplifier circuit. Bisection theorem. Differential gain. CMRR. Use of constant current circuit to improve CMRR. Derivation of transfer characteristic, Transconductance. Use as Linear amplifier, limiter, amplitude modulator.

UNIT III FREQUENCY RESPONSE OF AMPLIFIERS**9**

General shape of frequency response of amplifiers. Definition of cut off frequencies and bandwidth. Low frequency analysis of amplifiers to obtain lower cut off frequency Hybrid – pi equivalent circuit of BJTs. High frequency analysis of BJT amplifiers to obtain upper cut off frequency. High frequency equivalent circuit of FETs. High frequency analysis of FET amplifiers. Gain-bandwidth product of FETs. General expression for frequency response of multistage amplifiers. Calculation of overall upper and lower cut off frequencies of multistage amplifiers. Amplifier rise time and sag and their relation to cut off frequencies.

Ex.1: Diode Forward characteristics.

- i. Determination of η from the plot of $\ln I$ vs V .
- ii. Determinations reverse saturation current.

[Note that reverse characteristics of Diodes cannot be measured using common instruments available in the Lab.]

Ex.2: Input and Output characteristics of BJT.

- (i) Determination of h parameters from the graph.

Ex.3: Output characteristics of JFET.

- i. Plot of Transfer characteristics from the output characteristic
- ii. Determination of pinch off voltage and I_{dss}

Ex.4: Fixed Bias amplifier circuits using BJT.

- i. Waveforms at input and output without bias.
- ii. Determination of bias resistance to locate Q-point at center of load line.
- iii. Measurement of h_{FE} and gain.
- iv. Calculation of $h_{ie} = V_T / I_{bdc}$ and gain assuming $h_{FE} = h_{fe}$.
- v. Plot of frequency response.

Ex.5: BJT Amplifier using voltage divider bias (self bias) with unbypassed emitter resistor.

- i. Measurement of input resistance and gain
- ii. Comparison with calculated values.
- iii. Plot of DC collector current as a function of collector resistance (application as constant current circuit).

Ex.6: Source follower with Bootstrapped gate resistance.

Measurement of gain, input resistance and output resistance with and without Bootstrapping .

Comparison with calculated values.

Ex.7: Class B Complementary symmetry power amplifier

- i. Observation of the output wave form with cross over Distortion.
- ii. Modification of the circuit to avoid cross over distortion.
- iii. Measurement of maximum power output.
- iv. Determination of efficiency.
- v. Comparison with calculated values.

Ex.8: Differential amplifier using BJT.

- i. Construction of the circuit.
- ii. Measurement of DC collector current of individual transistors.
- iii. Equalization of DC current using individual emitter resistance (50 – 100 Ohms)
- iv. Measurement of CMRR.

Ex.9: Power supply Full wave rectifier with simple capacitor filter.

- i. Measurement of DC voltage under load and ripple factor, Comparison with calculated values.
- ii. Measurement of load regulation characteristics (V_{out} vs I_{out}) Comparison with calculated values.

Ex.10: Measurement of UJT and SCR Characteristics.

- ii. Firing Characteristics of SCR.
- iii. Measurement of Intrinsic stand off ratio of UJT.

UNIT I MULTIPLE INTEGRALS**9**

Double integration-Cartesian and polar coordinates-change of order of integration-area as a double integral-change of variables between Cartesian and polar coordinates-triple integration.

UNIT II VECTOR CALCULUS**9**

Gradient, divergence and curl-directional derivative-irrotational and solenoidal vector fields-Line, Surface and Volume Integral - Greens theorem in a plane, Guass divergence theorem and Stoke's theorem (excluding proof)-simple applications.

UNIT III ANALYTIC FUNCTIONS**9**

Function of a complex variable-analytic function -necessary condition-Cauchy - Riemann equation - sufficient condition (excluding proof)-properties of analytical function-harmonic conjugate-construction of analytic function.

UNIT IV COMPLEX INTEGRATION**9**

Statement and application of Cauchy's integral theorem and integral formula-Taylor and Laurent expansion – isolated singularities – residuals - cauchy residue theorem. Contour integration over unit circle and semicircular contours (excluding poles on boundaries).

UNIT V LAPLACE TRANSFORM**9**

Laplace Transform-conditions for existence- elementary functions- properties-derivatives and integrals of transforms-Transform of derivatives and integrals -Transforms of unit step function and impulse function-Transform of periodic functions – Convolution Theorem – Inverse transforms – Application to solution of linear ordinary differential equations up to second order with constant coefficients.

L:45; Total:45

TEXT BOOKS:

1. Grewal .B.S. Higher Engineering Mathematics, Thirty eighth Edition, Khanna Publication , Delhi 2004.
2. Kreyszig, E , Advance Engineering Mathematics, Eighth Edition, John Wiley and Son (Asia) Ltd Singapore 2001.

REFERENCES:

1. Bali N.P and Narayana Iyengar, N.Chand, Engineering Mathematics Laxmi Publication Pvt, Ltd, New Delhi, 2003.
2. Veerarajan. T., Engineering Mathematics Fourth Edition , Tata McGraw Publishing company Ltd, New Delhi, 2005.
3. Kandasamy. P., Thilagavathy. K, and Gunavathy. K Engineering Mathematics Volume I , II and III S. Chand & Co, New Delhi, 2005.
4. Venkataraman. M. K., Engineering Mathematics, Volume I and II Revised enlarge Fourth Edition, The National Publishing Company, Chennai, 2004.

UNIT I REPRESENTATION OF SIGNALS 9

Continuous and discrete time signals: Classification of Signals – Periodic aperiodic even – odd – energy and power signals – Deterministic and random signals – complex exponential and sinusoidal signals – periodicity – properties of discrete time complex exponential unit impulse – unit step impulse functions – Transformation in independent variable of signals: time scaling, time shifting.

Determination of Fourier series representation of continuous time and discrete time periodic signals – Explanation of properties of continuous time and discrete time Fourier series.

UNIT II ANALYSIS OF CONTINUOUS TIME SIGNALS AND SYSTEMS 9

Continuous time Fourier Transform and Laplace Transform analysis with examples – properties of the Continuous time Fourier Transform and Laplace Transform basic properties, Parseval's relation, and convolution in time and frequency domains.

Basic properties of continuous time systems: Linearity, Causality, time invariance, stability, magnitude and Phase representations of frequency response of LTI systems -Analysis and characterization of LTI systems using Laplace transform:

Computation of impulse response and transfer function using Laplace transform.

UNIT III SAMPLING THEOREM AND z-TRANSFORMS 9

Representation of continuous time signals by its sample - Sampling theorem – Reconstruction of a Signal from its samples, aliasing – discrete time processing of continuous time signals, sampling of band pass signals

Basic principles of z-transform - z-transform definition – region of convergence – properties of ROC – Properties of z-transform – Poles and Zeros – inverse z-transform using Contour integration - Residue Theorem, Power Series expansion and Partial fraction expansion, Relationship between z-transform and Fourier transform.

UNIT IV DISCRETE TIME SYSTEMS**9**

Computation of Impulse & response & Transfer function using Z Transform. DTFT Properties and examples – LTI-DT systems -Characterization using difference equation – Block diagram representation – Properties of convolution and the interconnection of LTI Systems – Causality and stability of LTI Systems.

UNIT V SYSTEMS WITH FINITE AND INFINITE DURATION IMPULSE RESPONSE**9**

Systems with finite duration and infinite duration impulse response – recursive and non-recursive discrete time system – realization structures – direct form – I, direct form – II, Transpose, cascade and parallel forms.

L:45; Total:45**TEXT BOOKS:**

1. Alan V. Oppenheim, Alan S. Willsky with S. Hamid Nawab, Signals & Systems, 2nd edn., Pearson Education, 1997.

REFERENCES:

1. John G. Proakis and Dimitris G. Manolakis, Digital Signal Processing, Principles, Algorithms and Applications, 3rd edn., PHI, 2000.
2. M. J. Roberts, Signals and Systems Analysis using Transform method and MATLAB, TMH 2003.
3. Simon Haykin and Barry Van Veen, Signals and Systems, John Wiley, 1999
4. K. Lindner, "Signals and Systems", McGraw Hill International, 1999.
5. Moman .H. Hays, "Digital Signal Processing", Schaum's outlines, Tata McGraw-Hill Co Ltd., 2004.
6. Ashok Amhardar, "Analog and Digital Signal Processing", 2nd Edition Thomson 2002.

UNIT - I INTRODUCTION**8**

Sources and effects of electromagnetic fields – Vector fields – Different co-ordinate systems(brief description only) - Divergence theorem – Stoke's theorem.

UNIT - II ELECTROSTATICS**10**

Coulomb's Law – Definitions-Electric charge, Electric field, flux, Properties of Flux lines, Flux density, Field intensity-Permittivity –Field due to point and continuous charges – Gauss's law and application – Electrical potential – Electric field and equipotential plots – Electric field in free space, conductors, dielectric – Dielectric polarization, Electric field in multiple dielectrics – boundary conditions, Poisson's and Laplace's equations, Example of application of Laplace equation – Capacitance, loss angle of capacitor-energy density – Dielectric strength.

UNIT - III MAGNETOSTATICS**9**

Lorentz Law of force, magnetic flux line, properties of magnetic flux lines, magnetic field intensity-permeability – Biot-savart's Law - Ampere's Law – Magnetic field due to straight conductors, circular loop, solenoid– Magnetic flux density (B) – B in free space, conductor, magnetic materials – Magnetization – Magnetic field in multiple media – Boundary conditions – Scalar and vector potential – Magnetic force – Torque – Self Inductance(L), Mutual Inductance(M) – Energy density – Magnetic circuits-permanent magnets.

UNIT - IV ELECTRODYNAMIC FIELDS**9**

Faraday's law of induced emf, eddy current loss- Hysteresis loss-Transformer and motional EMF, Maxwell's equations (differential and integral forms) –Conduction current, Displacement current – Relation between conduction current density and electric field intensity-Qualitative differences between field theory and circuit theory-Electro magnetic shielding.

UNIT - V ELECTROMAGNETIC WAVES**9**

Generation of electromagnetic waves– Electro Magnetic Wave equations – Wave parameters; velocity, intrinsic impedance, propagation constant, surge impedance of a line in terms of energy balance – Waves in free space, lossy and loss less dielectrics, conductors-skin depth, Poynting vector, typical applications of poynting vector – Plane wave- reflection and refraction- relation between electric field intensity and magnetic field intensity.-Introduction to wave guides.

L:45; Total:45

TEXT BOOKS:

1. John.D.Kraus, 'Electromagnetics', McGraw Hill book Co., New York, Fourth Edition, 1991.
2. William. H.Hayt, 'Engineering Electromagnetics', Tata McGraw Hill edition, 2001.

REFERENCES:

1. D.Sathaiah-M.Anitha, 'Electro magnetic fields' First edition-2007, SCITECH publications (India) Pvt Ltd., Chennai.
2. Joseph. A.Edminister, 'Theory and Problems of Electromagnetics', Second edition, Schaum Series, Tata McGraw Hill, 1993.
3. I.J. Nagrath, D.P. Kothari, 'Electric Machines', Tata McGraw Hill Publishing Co Ltd, Second Edition, 1997.
4. Kraus and Fleish, 'Electromagnetics with Applications', McGraw Hill International Editions, Fifth Edition, 1999.
5. Sadiku, 'Elements of Electromagnetics', Second edition, Oxford University Press, 1995.

UNIT 1 FEEDBACK AMPLIFIERS 9

Block diagram. Loop gain. Gain with feedback. Desensitivity of gain. Distortion and cut off frequencies with feedback. The four basic feedback topologies and the type of gain stabilized by each type of feedback. Input and Output resistances with feedback. Method of identifying feedback topology, feedback factor and basic amplifier configuration with loading effect of feedback network taken into account. Analysis of feedback amplifiers. Nyquist criterion for stability of feedback amplifiers.

UNIT II OSCILLATORS 9

Barkhausen Criterion. Mechanism for start of oscillation and stabilization of amplitude. Analysis of Oscillator using Cascade connection of one RC and one CR filters. RC phase shift Oscillator. Wienbridge Oscillator and twin-T Oscillators. Analysis of LC Oscillators, Colpitts, Hartley, Clapp, Miller and Pierce oscillators. Frequency range of RC and LC Oscillators. Quartz Crystal Construction. Electrical equivalent circuit of Crystal. Crystal Oscillator circuits.

UNIT III TUNED AMPLIFIERS 9

Coil losses, unloaded and loaded Q of tank circuits. Analysis of single tuned and synchronously tuned amplifiers. Instability of tuned amplifiers. Stabilization techniques. Narrow band neutralization using coil. Broad banding using Hazeltine neutralization. Class C tuned amplifiers and their applications. Efficiency of Class C tuned Amplifier.

UNIT IV WAVE SHAPING AND MULTIVIBRATOR CIRCUITS 9

RL & RC Integrator and Differentiator circuits. Diode clippers, clampers and slicers. Collector coupled and Emitter coupled Astable multivibrator. Monostable multivibrator. Bistable multivibrators. Triggering methods. Storage delay and calculation of switching times. Speed up capacitors. Schmitt trigger circuit.

Monostable and Astable Blocking Oscillators using Emitter and base timing. Frequency control using core saturation. Pushpull operation of Astable blocking oscillator i.e., inverters. Pulse transformers. UJT sawtooth generators. Linearization using constant current circuit. Bootstrap and Miller saw-tooth generators. Current time base generators.

Total : 60

TEXT BOOKS:

1. Millman and Halkias. C., "Integrated Electronics", Tata McGraw-Hill 1991,(I,II).
2. Schilling and Belove, "Electronic Circuits", TMH, Third Edition, 2002 (Unit - III)
3. Millman J. and Taub H., "Pulse Digital and Switching waveform", McGraw-Hill International (UNIT – IV & V)
4. Robert L. Boylestead and Louis Nasheresky, 8th edn., PHI, 2002.

REFERENCES:

1. Sedra / Smith, "Micro Electronic Circuits" Oxford university Press, 2004.
2. David A. Bell, " Solid State Pulse Circuits ", Prentice Hall of India, 1992.

Electronic Circuits Lab

1. Series and Shunt feedback amplifiers:
Frequency response, Input and output impedance calculation
2. Design of RC Phase shift oscillator: Design Wein Bridge Oscillator
3. Design of Hartley and Colpitts Oscillator
4. Tuned Class C
5. Integrators, Differentiators, Clippers and Clampers
6. Design of Astable and Monostable and Bistable multivibrators

SIMULATION USING PSPICE:

1. Differential amplifier
2. Active filter : Butterworth IInd order LPF
3. Astable, Monostable and Bistable multivibrator - Transistor bias
4. D/A and A/D converter (Successive approximation)
5. Analog multiplier
CMOS Inverter, NAND and NOR