Shivaji University, Kolhapur.

Revised Syllabus & Structure of

S.E. Part-I & II
(Electronics and Telecommunication Engineering)

Semester –III and IV

(w.e.f. Academic Year 2008-09)

Shivaji University, Kolhapur.

Revised Syllabus Structure of Second Year Engineering (S.E.)
(Electronics & Telecommunication Engineering) Course
w.e.f. Academic Year 2008-09

Scheme of Teaching & Examination

SEMESTER – III

Sr. No	Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)				
		L	T	P	Total	Theory	TW	POE	OE	Total
1	Engineering. Mathematics - III	3	-	-	3	100	-	-	-	100
2	Electrical Machines and measurements	3	-	2	5	100	25		-	125
3	Analog Electronic circuits & Design - I	4	-	2	6	100	25	50	-	175
4	Linear circuits	3	1	2	6	100	25	-	-	125
5	Digital Design	3	1	2	6	100	25	50	-	175
6	Programming techniques	2	-	2	4	-	50	50	-	100
	Total	18	2	10	30	500	150	150	-	800

SEMESTER – IV

Sr. No	Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)				
		L	T	P	Total	Theory	TW	POE	OE	Total
1	Analog Electronic circuits & Design - II	4	-	2	6	100	25	50	-	175
2	Electronics Communication systems	4	-	2	6	100	25	50	-	175
3	Microprocessor and peripherals	3	-	2	6	100	25	50	-	175
4	Data Structures	3	1	2	6	100	25		-	125
5	Electromagnetic Fields.	3	1		4	100	25	-	-	125
6	Circuit Simulation	1	-	2	2	-	25	-	-	25
	Total	18	2	10	30	500	150	150	-	800

Shivaji University, Kolhapur

Syllabus Structure of Third Year [T.E.] (E&TC) Engineering Course

Scheme of Teaching and Examination

SEMESTER – V

Sr. No.	Name of the Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)			
		L	T	P	Total	Theory	TW	Pract./ Oral	Total
1	Embedded Systems	4	-	2	6	100	25	POE 50	175
2	Digital Communication	3	-	2	5	100	25	POE 50	175
3	Signals & Systems	3	1	-	4	100	25	--	125
4	Analog integrated circuits & applications.	3	1	2	6	100	25	POE 50	175
5	Control Systems.	3	-	2	5	100	25	--	125
6	Computer Simulation (MATLAB/Lab view)	2	--	2	4	--	25	---	25
	Total	**18**	**2**	**10**	**30**	**500**	**150**	**150**	**800**

Shivaji University, Kolhapur

Syllabus Structure of Third Year [T.E.] (E&TC) Engineering Course

Scheme of Teaching and Examination

SEMESTER – VI

Sr. No.	Name of the Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)			
		L	T	P	Total	Theory	TW	Pract./ Oral	Total
1	Digital Signal Processing	4	1	2	7	100	25	50	175
2	Antenna & Wave Propagation	3	1	2	6	100	25	50	175
3	Electronics system design	4	1	2	7	100	25	50	175
4	Total quality Management	3	--	--	3	100	--	--	100
5	Optical Communication	4	1	-	5	100	25	-	125
6	Seminar	-	-	2	2	--	50		50
	Total	**18**	**4**	**8**	**30**	**500**	**150**	**150**	**800**

Shivaji University, Kolhapur

Syllabus Structure of Final Year [B.E.] (E&TC) Engineering Course

Scheme of Teaching and Examination

SEMESTER – VII

Sr. No.	Name of the Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)			
		L	T	P	Total	Theory	TW	Pract./ Oral	Total
1	Computer Communication Network	4	-	2	6	100	25	OE 50	175
2	Wireless Communication	3	1	2	6	100	25	--	125
3	Advance microwave engineering	3	1	2	6	100	25	OE 50	175
4	Industrial and power electronics	4	-	2	6	100	25	POE 50	175
5	Elective I	4	-	---	4	100	--	--	100
6	Project I	--	--	2	2	--	25	-	50
7	Industrial Training (At the end of Sem. VI —2 Weeks Mini.)	--	--	--	--	--	25	--	25
Total		**18**	**2**	**10**	**30**	**500**	**150**	**150**	**800**

Elective –I

1) Continuous Speech processing
2) VLSI Design
3) Real time operating systems
4) Telecommunication switching System

Shivaji University, Kolhapur

Syllabus Structure of Final Year [B.E.] (E&TC) Engineering Course

Scheme of Teaching and Examination

SEMESTER – VIII

Sr. No.	Name of the Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)			
		L	T	P	Total	Theory	TW	Pract./ Oral	Total
1	Audio-Video Communication	4	-	2	6	100	50	50	175
2	Broadband Communication	4	--	2	6	100	25	50	175
3	Elective- II	4		--	4	100	25	-	125
4	Elective- III	4		--	4	100	25	--	125
5	Project II	--	--	8	8	---	75	100	200
	Total	**16**	**--**	**12**	**28**	**400**	**200**	**200**	**800**

Elective II

1) Multimedia Communication
2) Statistical theory of communication
3) Signal compression & wavelets
4) Advance communication system

Elective III

1) Fuzzy Neural Network
2) D.S.P. Processors
3) Image processing
4) Biomedical Instrumentation

Shivaji University, Kolhapur.

Revised Syllabus Structure of Second Year Engineering (S.E.)
(Electronics & Telecommunication Engineering)
Course w.e.f. Academic Year 2008-09

Scheme of Teaching & Examination

SEMESTER – III

Sr. No	Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)				
		L	T	P	Total	Theory	TW	POE	OE	Total
1	Engineering. Mathematics - III	3	-	-	3	100	-	-	-	100
2	Electrical Machines and Measurements	3	-	2	5	100	25		-	125
3	Analog Electronic circuits & Design - I	4	-	2	6	100	25	50	-	175
4	Linear circuits	3	1	2	6	100	25	-	-	125
5	Digital Design	3	1	2	6	100	25	50	-	175
6	Programming Techniques	2	-	2	4	-	50	50	-	100
	Total	18	2	10	30	500	150	150	-	800

SEMESTER – IV

Sr. No	Subject	Teaching Scheme (Hrs)				Examination Scheme (Marks)				
		L	T	P	Total	Theory	TW	POE	OE	Total
1	Analog Electronic circuits & Design - II	4	-	2	6	100	25	50	-	175
2	Electronics Communication systems	4	-	2	6	100	25	50	-	175
3	Microprocessor and peripherals	3	-	2	6	100	25	50	-	175
4	Data Structures	3	1	2	6	100	25		-	125
5	Electromagnetic Fields.	3	1		4	100	25	-	-	125
6	Circuit Simulation	1	-	2	2	-	25	-	-	25
	Total	18	2	10	30	500	150	150	-	800

Shivaji University, Kolhapur.
Revised Syllabus w.e.f. Academic Year 2008-09

S.E. (Electronics and Telecommunication Engineering)
Semester -III

ENGINEERING MATHEMATICS – III

Teaching Scheme	**Examination Scheme**
Lectures : 3 hours/week	Theory: 100 marks
Tutorial : ---	Term work : --

SECTION – I

UNIT-I: Linear Differential Equations: **(6 Hrs)**

Linear Differential Equations with constant coefficients, Homogenous Linear differential equations, method of variation of parameters, Applications of LDE with constant coefficients to Electrical systems.

UNIT-II: Partial Differential Equation: **(4 Hrs)**

Four standard forms of partial differential equation of first order

UNIT-III: Fourier Series: **(5 Hrs)**

Definition, Euler's formulae, Conditions for a Fourier expansion, Functions having points of discontinuity, change of interval, expansions of odd and even periodic functions, Half range series.

UNIT-IV: Fourier Transforms: **(5 Hrs)**

Fourier transforms, Fourier sine and cosine transforms, complex form of Fourier integral, Finite Fourier sine and cosine transforms.

SECTION – II

UNIT–V: Laplace Transform: **(5 Hrs)**

Definition, properties of Laplace transforms, transforms of derivatives, transforms of integral, Inverse Laplace transforms, Convolution theorem. Applications to initial value boundary problems, Heaviside Unit step function, Dirac-delta function, Periodic function.

UNIT- VI: Z Transform: **(5 Hrs)**

Definition, properties of z transform , Z Transform of basic sequences , Z transform of some standard discrete function inverse Z transform

UNIT- VII:Probability: **(5Hrs)**

Definitions of Random variable, Discrete and continuous random variable, Expected value of random variable, Variance, Moments and moment generating functions. Probability mass function and probability density function, Probability distribution for random variables , Binomial, Poisson and Normal distributions

UNIT -VIII: Vector Differentiation: **(5 Hrs)**

Differentiation of vectors, Gradient of scalar point function, Directional derivative, Divergence of vector point function, Curl of a vector point function. Irrotational and solenoidal vector field.

Reference Books:

1. A text book of Applied Mathematics: Vol. I, II and III by J. N. Wartikar & P. N. Wartikar , Vidyarthi Griha Prakashan, Pune.
2. Higher Engineering Mathematics by Dr. B. S. Grewal.
3. Advanced Engineering Mathematics by Erwin Kreyszig.
4. A textbook of Engineering Mathematics by N. P. Bali, Ashok Saxena and N. Ch. S. N. Iyengar- Laxmi Publication, Delhi.
5. Fundamental of Statistics by S. C. Gupta.

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Revised Syllabus w.e.f. Academic Year 2008-09

S.E. (Electronics and Telecommunication Engineering)
Semester- III

Electrical Machines and Measurements

Teaching Scheme:	**Examination Scheme:**
Lectures: 3 hr/week	Theory : 100 Marks
Practical: 2 hr/week	Term Work: 25 Marks

Section -I

UNIT-I: D.C. Motors: (6Hrs)

Speed control of shunt & series motors , armature voltage control , flux control , series – parallel control, Electrical braking –Dynamic, Plugging , regenerative for shunt and series motors , starters for DC motors – three point , four point starters , face plate type controller, electronic starter, numerical on speed control.

UNIT-II: Induction Motor : (6 Hrs)

Construction , types , working principle , torque equation – relation among starting maximum & running torque , torque slip characterstics, effect of rotor resistance on maximum torque , speed control methods – frequency control , pole changing methods , voltage control , rotor resistance control , constant V/F & constant voltage – variable frequency , modes of operation , starters for three phase induction motor- D.O.L, Star/delta , autotransformer, rotor resistance starter.
Numericals on power stages & torque equations. Equivalent circuit, linear induction motor.

UNIT-III: Electrical Devices – Instruments (6Hrs)

Servo & Stepper Motors: Working principle, construction, types, and applications.
Electromagnetic relay , induction relay contactors , Potential transformer, current transformer , auto – transformer , miniature Circuit Breaker (MCB), Earth Leakage Circuit Breaker(ELCB) ,Dynamometer type wattmeter ,.

Section-II

UNIT-IV: Transducers : (6Hrs)

Definition, classification, transducer selection, different types of transducers, strain gauges, RTD, thermistor, thermocouple, LVDT, capacitive transducers, piezoelectric transducer, photovoltaic cell, LDR, pressure transducer speed measurement using magnetic and photoelectric pickup, IC based Sensor-LM35

UNIT- V: **Introduction to Measurements :**

(6Hrs)

Measurements, significance of measurements, methods of measurements- Direct & indirect method, elements of generalized measurement system, measurement system performance, Performance characteristics- static and dynamic characteristic, Errors- Types & source of error.
Digital voltmeters- Introduction, Dual Slope Integrating type DVM, Integrating type DVM & successive approximation principles, general specifications of DVM, digital multimeter, digital measurements of time, digital frequency meter , Q meter,

UNIT VI : Measuring Devices : (6Hrs)

CRO: Dual Beam, Dual Trace, sampling, Digital storage, measurement of phase and frequency using Lissajous pattern, CRO probes: active, passive, current, attenuators
display devices & principle: LED,LCD,graphics display .
Signal generators, Function generators. Spectrum analyzer, logic analyzer

Text Books

1. H .S. Kalsi 'Elecronic Instrumentation' – 2nd edition --Tata McGraw Hill Publication
2. A. D. Helfrick , W. D. Cooper ' Modern Electronic Instrumentation and Measurement Techniques'-- Pearson Education

Reference Book:

1. A.K.Sawhney 'A Course in Electrical & Electronics Measurement & Instrumentation.' --11th Edition, 1996 --Dhanpat Rai & sons
2. C.S. Rangan ,G.R. Sharma , V.S.V. Mani 'Instrumentation devices and system'— 2nd edition --Tata McGraw Hill Publication
3. B.C.Nakra, K.K.Choudhary 'Instrumentation, Measurement and Analysis' 2nd edition -- Tata McGraw Hill Publication l
4. E.O.Doebeline.'Measurement systems application and design 'Tata McGraw Hill Publication
5. Oliver Cage 'Electronic measurement and instrumentation 'Tata McGraw Hill Publication

Term Work:

List of Experiments (Minimum 8)

1. Study of temperature transducers: (Any two)
   a) RTD
   b) Thermocouple
   c) Thermistor
2. Study of displacement transducers: (Any two)
   a) Inductive
   b) Capacitive
   c) Resistive
3. Study of weight measurement using strain gauge:
4. Study of speed measurement using : (Any one)
   a) Magnetic pick up
   b) Photoelectric pick up
5. Study of AC and DC bridges: (Any two)
   a) Wheastones' bridge
   b) Maxwell's bridge
   c) Wein bridge
6. Measurement of frequency and phase using Lissageous patterns
7. Study of digital storage oscilloscope
8. Study of spectrum analyzer / Wobbuloscope.
9. Study of pressure measurement using bourdan tube
10. Speed control of DC shunt Motor using:
    a) Flux control and b) Armature voltage control
11. Load test on three phase Induction Motor

Shivaji University, Kolhapur.
Revised Syllabus w.e.f. Academic Year 2008-09

S.E. (Electronics and Telecommunication Engineering)
Semester- III

ANALOG ELECTRONIC CIRCUITS AND DESIGN – I

Teaching Scheme:	**Examination Scheme**:
Lecturers : 4 hr/week	Theory : 100 marks
Practical : 2 hr/week	Term Work : 25 marks
Tutorial : - hr/week	POE : 50 marks

Section-I

UNIT-I: Unregulated Power Supplies: (8 Hrs)
Specification and ratings of diodes (P-N junction, Zener and power diode) and transistor (low power, high power & switching) .
Rectifiers: Half wave, full wave: center tap and bridge type, analysis for different parameters: PIV, TUF, efficiency, ripple factor, regulation, etc.
Filters: Need of filters, Types: capacitor, inductor, LC, CLC, Analysis for ripple factor and regulation.
Design of unregulated power supply with and without filter.

UNIT-II: Voltage Regulators : (8Hrs)
Need of voltage regulator, Stabilization factors, Analysis & Design of
Shunt regulator (using Zener diode & BJT), series voltage regulator (using BJT)
Series voltage regulator with Pre- regulator & Overload protection circuit.

UNIT-III: Transistor Biasing : (8Hrs)
Need of biasing, DC load line analysis, operating point, thermal runaway. Different biasing circuits: fixed bias, collector to base bias & voltage divider bias. Stability factor, General expression for stability factor, stability factor for all biasing circuits. Design of biasing circuits, Compensation techniques: Thermistor and diode compensation

Section-II

UNIT-IV: Voltage Amplifiers:- (10 Hrs)
H-Parameters, Hybrid model for transistor (CE, CB& CC configuration), Generalized H-parameter analysis of transistor amplifier for Voltage Gain, Current gain, Input resistance & Output resistance taking Rs into account, approximate H-parameter model for CE,CB & CC. Classification of voltage amplifiers, Detailed study of Single stage RC coupled amplifier & Emitter follower. Analysis for voltage gain, current gain, input resistance & Output resistance. Design of single stage RC coupled amplifier & Emitter follower.

UNIT-V: Frequency Response of Single Stage RC Coupled Amplifier: (8Hrs)
Low frequency response: Effect of emitter bypass capacitor(C_E) & Coupling capacitor(C_C), Amplifier response to square wave, percentage Sag calculation, (Numerical are expected)
High frequency response: Hybrid π model , Derivation for CE short circuit & resistive current gain, β cutoff, α cutoff frequency, approximate amplifier high freq. response to square wave ,gain bandwidth product, (Numerical are expected)

UNIT-VI: Feedback Amplifiers : (6Hrs)

General theory of feedback, reasons for negative feedback.

Types of negative feedback in transistor circuits: Voltage series, Current series, Voltage shunt, Current shunt feedback amplifiers, Darlington pair, Darlington amplifier using bootstrapping principle,. (Numerical are expected)

Design of Voltage series feedback amplifier

Text Books:

1. Allen Mottershed –'Electronic devices & circuits'-Prentice- Hall India
2. J. Millman & C.Halkias -'Electronic devices & circuits'-IInd Edition- Tata McGraw Hill Publication
3. N.C. Goyal & R.K. Khetan-' A Monograph on Electronics Design Principles'-Vth Edition-Khanna Publishers

References Books:

1. David A. Bell –'Electronic devices & circuits'- IVth Edition- Prentice- Hall India
2. Robert L. Boylsted, Louis Nashelsky- 'Electronic devices & circuit theory'- (IXth edition)- Pearson Education
3 National Semiconductor Data Manual.

List of Experiments (Minimum 10)

1. Study of ratings of Electronic components and lab. Equipments.
2. Design & analysis of Half wave rectifier(HWR) with & without filter by calculating performance parameters
3. Design & analysis of Full wave rectifier(FWR) with & without filter by calculating performance parameters
4. Design & analysis of Bridge rectifier with & without filter by calculating performance parameters
5. Design & analysis of Zener shunt regulator.
6. Design & analysis of Transistorized shunt regulator.
7. Design & analysis of series pass regulator with & without pre- regulator.
8. Design & analysis of Voltage divider biasing circuit.
9. Determination of H-parameters from transistor CE characteristics.
10. Calculation of performance parameters (Av, Ai, Ri, Ro) for single stage RC coupled amplifier.
11. Study of Frequency response of single stage stage RC coupled amplifier.
12. Study of square wave response of RC coupled amplifier & calculation of Sag & rise time (t_r).
13. Comparative study of voltage amplifiers (with & without feedback).
14. Design & analysis of voltage series feedback amplifier.

Note for paper setter:

- Question paper shall consist of approximately 60% analysis & design based problems and approximately 40% theory type questions.

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S.E. (Electronics and Telecommunication Engineering)
Semester-III

LINEAR CIRCUITS

Teaching Scheme:
Lecturers: 3 hr/week
Practical: 2 hr/week
Tutorial : 1 hr/ week

Examination Scheme:
Theory : 100 Marks
Term Work: 25 Marks

Section -I

UNIT-I: Network Fundamentals : **(6 Hrs)**

Basic Definitions: Passive Network, Active Network, Linear Element, non-linear elements, Unilateral, bilateral, lumped & distributed elements.

Representation of voltage & current sources.(Ideal & practical) , source transformation, series & parallel connection of passive elements(R,L,C), graph of network & its parts, loops & trees, linear graphs & incidence matrix, cutsets, planner & non-planner graph loop matrix.

Star- Delta transformation, reduction of networks: Mesh analysis, Node analysis.

UNIT-II: Network Theorems: **(4 Hrs)**

Superposition Theorem, Millman's Theorem, Compensation Theorem,
Norton's Theorem, Thevenin's Theorem, Maximum Power Transfer Theorem,
Reciprocity Theorem.

UNIT-III : Two Port Network & Network Functions: **(8 Hrs)**

Two port network**:** Open circuit impedance (Z) parameters, Short circuit admittance (Y) parameters , Hybrid (H) parameter, Transmission parameters(ABCD), Interrelation of different parameters, Interconnections of two port network (Series, Parallel, Cascaded, Series-Parallel) T & Π representation .

Network Functions : Network functions for one port & two port networks, Driving point impedance and admittance of one port network, Driving point impedance, admittance & different transfer function of two port network (**Z,Y,G & α parameters**). Concept of complex frequency, significance of poles & zeros. Restrictions on poles & zeros for transfer & drawing points function ,stability concept in passive circuit using Routh-Harwitz criterion , pole zero diagram.

Section -II

UNIT-IV : Resonance : **(6 Hrs)**

Defination , Types: series & parallel resonance.

Series resonance- resonant frequency, variation of impedance, admittance, current & voltage across L & C w.r.t. frequency, Effect of resistance on frequency response, Selectivity , B.W.& Quality factor.

Parallel resonance – Anti resonance frequency, variation of impedance & admittance with frequency, . Selectivity & B.W.

UNIT-V: Filters & Attenuators: (8 Hrs)

Definitions, classification & characteristics of different filters, filter fundamental such as attenuation constant (α) , phase shift (β) propagation constant (γ) characteristic impedance (Zo) , decibel ,neper.

Design & analysis of constant K , M derived & composite filters (low pass, high pass, band pass & band stop filters): T & Π sections.

Attenuators - Definitions, classification , relation between neper & decibel . Analysis & design of T type, Π type , α Lattice , bridged- T & L types attenuators

UNIT-VI : Transient Response: (4 Hrs)

Steady state & transient response (Voltage & Current)
DC response of RL circuit
DC response of RC circuit
DC response of RLC circuit
Sinusoidal response of RL, RC & RLC circuit

Term Work: (Minimum 10 tutorials):

Minimum 10 tutorials based on above syllabus covering all units.

Practials :
Minimum 08 experiments based on above syllabus covering all units.

Text book :

1 .A. Sudhakar ,Shyammohan S.Palli 'Circuit & Network – Analysis & Synthesis' IIIrd Edition – Tata McGraw Hill Publication
2. D. Roy Choudhury 'Networks & Systems' - New Age International Publisher

Reference books:

1. A.Chakrabarti 'Circuit Theory (Analysis & Synthesis)' - IIIrd Edition
Dhanpat Rai & co
2. M.E.Van Valkenburg ' Network Analysis' - IIIrd Edition , Pearson Education / PHI
3. Josheph Edministrar 'Theory & Problems of Electronic Circuit (Schaum's series) – Tata Mc Graw Hill, Publication.
4. Soni Gupta 'Electrical Circuit Analysis' Dhanpat Rai & Co.
5. Boylestad 'Introductory Circuit Analysis – Universal book stall, New Delhi.

Note for paper setter:

- Question paper shall consist of approximately 60% Numerical problems & approximately 40% theory should be covered.

Shivaji University, Kolhapur.
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S.E. (Electronics and Telecommunication Engineering)
Semester-III

DIGITAL DESIGN

Teaching Scheme:	**Examination Scheme**:
Lectures: 3hr/week	Theory: : 100 marks
Practical : 2hr/week	Term Work : 25 marks
Tutorial : 1 hr/week	POE : 50 marks

Section-I

UNIT-I: Binary Arithmetic & Codes: (4Hrs)
Binary arithmetic operations: addition, Subtraction, multiplication, Division of binary numbers, Subtraction using 2's complement method.
Binary codes: weighted and non weighted codes, self complementary codes, BCD, Excesses-3, Gray codes, error detecting and correcting codes, hamming codes, alphanumeric codes, ASCII Codes.

UNIT- II: Boolean Algebra: (4Hrs)
Boolean Laws and Expression using Logic Gates, Realization of different gates using Universal gates, De-Morgan's Theorem, Duality Theorems.
Standard forms: SOP, POS, Simplification of Switching function & representation (Maxterm & Minterm), Boolean expression & representation using logic gates, Propagation delay in logic gate.

UNIT- III: Boolean Function Reduction Techniques : (6Hrs) Karnaugh map: K-map Format up to 4 variables, mapping and minimization of SOP and POS expression, Don't care condition, conversion from SOP to POS and POS to SOP form using K-map, minimization of multiple output circuits,

UNIT- IV: Logic Families: (4 Hrs)
Digital IC specification terminology, Logic families: TTL, CMOS, ECL families, Interfacing of TTL-CMOS & CMOS-TTL.

Section-II

UNIT- V :Combinational Circuits Design : (6Hrs)
Adder & Subtractor(Half and Full), Parallel Binary adder, BCD Adder, Binary multipliers, Code Converters, parity bit generator, Comparators, , Decoder, BCD to 7-segment Decoder ,Encoders, Priority encoders, Multiplexers, De- Multiplexers

UNIT VI: Sequential Circuits Elements: (6Hrs)

Flip-flop & Timing Circuits: SR latch, Gated latch, Edge triggered flip-plop:- D, JK, T Flip-flop, flip-flop asynchronous inputs ,characteristic table of Flip-flop, excitation table of Flip-flop, , master slave JK flip flop, inter conversion of Flip-flop.

Study of timing parameters of flip-flop: clock to Q, setup time, hold time, timing parameters of flip-flop asynchronous input.

UNIT-VII: Applications of Sequential circuits. (6Hrs)

Shit resistor: buffer register, controlled buffer register.

Data transmission in shift resistor SISO, SIPO, PISO, PIPO, Bidirectional shift resistor universal shift resistor.

Counter: Classification, Ripple or asynchronous counter, Effect of propagation delay in ripple counters, up-down counter, Mod-n counter, synchronous counter, Ring counter, Johnson counter.

Text Books:

1. A. Anand Kumar 'Fundamentals of Digital Circuits'--. PHI
2. M. Morris Mano 'Digital Design'-- (Third Edition),. PHI

Reference Books:

1. Willim I. Fletcher.'An Engineering Approach to Digital Design'—PHI/ Pearson
2. Norman Balabanian Bradle Carlson. 'Digital Logic Design Principals,.' Wiley Publication.
3. Rajkamal 'Digital Systems Principals and Design'—Pearson
4. A.P. Malvino, D.P. Leach 'Digital Principles & Applicatios' -VIth Edition-Tata Mc Graw Hill, Publication.
5. R.P. Jain-'Modern Digital Electronics' IIIrd Edition- Tata Mc Graw Hill, Publication.

Term Work:

List of Experiments: [Minimum 10]

1. Study of basic gates using TTL, CMOS: 7432, 4011,4050, 4070,4071,40106
2. Study of Static I/O and transfer Characteristic of TTL.
3. Study of Static I/O and transfer Characteristic of CMOS.
4. Study of Universal gates (NAND, NOR)
5. K map based implementation of combinational logic
6. Half and Full Adder, Half and Full Subtractor
7. 4 bit Adder subtracor using IC 7483
8. Code Converters (Binary to Gray, Excess 3 to Binary)
9. Comparator using IC 7485
10. Implementation of combinational logic using MUX
11. Study of Decoder and DEMUX (IC 74138)
12. Study of 7 segment decoder driver. (IC 7447)
13. Study of Flip Flops (SR FF, D FF, JK FF, T FF)
14. Design Built and test MOD N counter
15. Design Built and test Shift Register

Tutorials: (minimum 10)

1) Tutorial based on comparative study of various types of TTL Circuits
2) Tutorial based on Characteristics of of TTL family
3) Based on datasheets of following TTL & CMOS ICs
   7400,7402,7404,7408,7432,7486,7446/47,7474,7476,7490,7493,7495,7483,7485,74154,74150

Shivaji University, Kolhapur.
Revised Syllabus w.e.f. Academic Year 2008-09

SE (Electronics and Telecommunication Engineering)
Semester-III

PROGRAMMING TECHNIQUES

Teaching Scheme:	**Examination Scheme:**
Lectures: 2hr/week	POE : 50 marks
Practical: 2hr/week	Term Work: 50 marks

UNIT-I: Introduction: (3 Hrs)
Object oriented programming [C++], applications of OOP & C++, dynamic initialization of variables, storage classes. Functions in C++, function prototype, call & return by reference, inline function, Default & Const argument.

UNIT-II: Classes & Objects: (4 Hrs)
Introduction ,structures,classes, defining member function, making an outside function inline, Nesting member function, private member function, Arrays within a class, memory allocation for objects, Array of objects, pointer to members. Pointers to objects this Pointer.

UNIT-III: Constructors and Destructors: (4 Hrs)
Constructors, parameterized and multiple, constructors with default arguments, Dynamic initialization of objects (*new, delete*) copy constructor, dynamic constructors and destructors.

UNIT-IV: Polymorphism & Inheritance: (6 Hrs)
Function overloading, Unary & binary operator overloading, manipulation of strings using operators. Friend function & friend class.
Single, multiple, multilevel, Hybrid, Hierarchical inheritance, virtual base classes, Abstract classes. Templates,exception handling.

UNIT-V: File Handling : (3 Hr)
Classes for file stream operations, opening and closing of files, file modes, file pointer & their manipulations, sequential I/O operations.

UNIT-VII: Graphics : (4 Hr)
Introduction to graphics.
Text mode graphics function ,The window function,text mode functions cputs,ctrscro ,Graphics mode graphics function,integraph,circle, closegraph setting colours,lines & rectangle ,polygon

Text Book:
1. E Balgurusamy –'Object oriented programming with C++' -, IIIrd Edition- Tata Mc- Graw Hill Publication

Reference Book:

1. Herbert Schildt –'The Complete Reference C++' - IIIrd Edition - Tata McGraw Hill Publication
2. Ravichandran D.-'Programming with C++ '-IInd Edition- Tata McGraw Hill Publication
3. Robert Lafore –'C++ Programming' –. IV th Edition –Techmedia, New Delhi.
4. Object oriented programming in Turbo C++ - Robert Lafore
- Galgotia pub.

Term Work :-

A] 10 programmes based on above syllabus.

B] Mini project based on data structures, file handling, graphics and it should be carried out by a group of *two* students only.

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Revised Syllabus w.e.f. Academic Year 2008-09

S.E. (Electronics and Telecommunication Engineering)
Semester-IV

ANALOG ELECTRONIC CIRCUITS & DESIGN--II

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 hr/week	Theory : 100 marks
Practical: 2 hr/week	Term Work : 25 marks
	POE : 50 marks

Section – I

UNIT –I: Wave Shaping Circuits: (7Hrs)

Low pass & high pass RC circuits (square & step response), High pass RC circuit as a differentiator, Low pass RC circuit as integrator.

Clipping circuits: Classification, diode clippers, transistor clippers, Transfer characteristics, Design & analysis of clipper circuits.

Clamping circuits: Classification, clamping operations, Clamping circuit theorem, practical clamping circuits,

Voltage multipliers: Doubbler, Trippler & Qudrappler circuits.

UNIT –II: Multi Stage Amplifiers : (6Hrs)

Need of cascading, Parameter evaluation such as Ri , Ro, Av, Ai & Bandwidth for general multi stage amplifier ,Analysis & design at low frequency & mid frequency of RC coupled, direct coupled & voltage series feed back (Two stage) amplifier.

UNIT –III: Power Amplifiers : (7Hrs)

Need of Power amplifier, classification of power amplifier, Power considerations,

Distortion in power amplifiers: Phase, Frequency, amplitude/ harmonic / non linear distortion, amplitude distortion using Three point method.

Class A single ended transformer coupled amplifier& class A Push pull amplifiers analysis and design, Class B amplifier & class B push pull amplifier analysis & design, crossover distortion, class AB Push pull amplifiers analysis and design

Complementary symmetry power amplifier.

UNIT–IV: FET & MOSFET: (6Hrs)

Biasing of JFET, Common source FET amplifier at low and high frequency- analysis and design.

MOSFET-construction, characteristics and comparative study of Enhancement and Depletion MOSFET (P-channel & N-channel),Handling precautions of MOS devices, ratings and specifications of MOS,CMOS inverter.

Section – II

UNIT –V: Oscillators: (8Hrs)

Barkhausen's criteria , Frequency and amplitude stability, Classification,
RC oscillators : RC phase shift & Wein bridge oscillator analysis & design using BJT & FET , LC oscillators: Colpit's & Hartely's oscillators analysis and design
using BJT, Crystal oscillator.

UNIT –VI: Multivibrators : (9Hrs)

Transistor as a switch, Different transistor switching parameters, classification of multivibrators, Analysis and design of Astable, Monostable, Bistable multivibrator and Schmitt trigger using BJT. Design of triggering circuits for Multivibrators

UNIT –VII : IC Regulators : (5Hrs)

Study and design of regulators using IC's :78XX,79XX,723,LM317,
Switching regulator: Introduction, study of LM3524.

Text Books:

1. J. Millman & C.Halkias -'Electronic devices & circuits'-IInd Edition- Tata McGraw Hill Publication
2. Allen Mottershed –'Electronic devices & circuits'-Prentice- Hall India
3. N.C. Goyal & R.K. Khetan-' A Monograph on Electronics Design Principles'-Vth Edition-Khanna Publishers
4. J. Milman & H. Taub ' Pulse Digital & Switching Waveforms'
   - IInd Edition- Tata McGraw Hill Publication

References Books:

1. David A. Bell –'Electronic devices & circuits'- IVth Edition- Prentice- Hall India
2. J Millman & A. Grabel-' Microelectronics'- IInd Edition- McGraw Hill International Editions
3 National Semiconductor Data Manual.
4 M.S. Roden, G.L. Carpenter ' Electronic Design- From Concept to reality'-IV th Edition-Shroff publisher & Distributors

Term Work:

List of experiments (Minimum 10)

1. a Study of RC low pass filter as an integrator
   b. Study of frequency response of low pass filter
2 a. Study of RC high pass filter as an differentiator
   b. Study of frequency response of high pass filter
3. Design of different clipper circuits
4. Study of different clamper circuits: positive, negative & bias
5. Design & study of Frequency response of two stage RC coupled amplifiers
6. Study of power amplifiers
7. Design of astable multivibrators
8. Design of monostable multivibrators
9. Design of bistable multivibrators
10. Design of Schmitt trigger
11. Design of Wein bridge oscillator using BJT.
12. Design of RC phase shift oscillators using BJT/ FET.
13. Design of Collpitt's oscillators using BJT
14. Design of Hartly oscillators using BJT
15. Study of Frequency response of Common Source(CS) amplifier

Note for paper setter:

- Question paper shall consist of approximately 60% analysis & design based problems and approximately 40% theory should be covered.

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S.E. (Electronics and Telecommunication Engineering)
Semester- IV

ELECTRONICS COMMUNICATION SYSTEMS

Teaching Scheme:
Lectures : 4 hr/week
Practical : 2 hr/week

Examination Scheme:
Theory : 100 Marks
Term Work : 25 Marks
POE : 50 Marks

Section-I

UNIT-I: Introduction : (5 Hrs)
Block schematic of communication system, base band signals, RF bands, Necessity of modulation, types of modulation – AM, FM, PM and Pulse Modulation. Noise types, Noise figure. Introduction to radio wave propagation, ground wave, space wave and sky wave.

UNIT-II: Amplitude Modulation : (7 Hrs)
Amplitude Modulation principles, AM envelope, frequency spectrum & BW, phase representation of AM wave, Modulation index, % modulation (Numericals expected)
AM modulating circuits: Low level AM modulation, medium power AM modulation,
AM transmitters: Block of low level DSBFC, High level DSBFC, Trapezoidal patterns
Evolution and descriptions of SSB, Suppression of carrier using balanced modulator, Suppression of unwanted sideband, Methods: Filter system, phase shift & third method Vestigial sideband(VSB)

UNIT-III: Angle Modulation: (10 Hrs)
Theory of frequency and phase modulation, mathematical analysis, deviation sensitivity, FM and PM waveforms, phase deviation and modulation index, frequency deviation and percentage modulation, angle modulation circuits using varactor diode ,using frequency analysis of angle modulated wave-Bessel function, BW requirements, deviation ratio, Noise and angle modulation, pre-emphasis and de-emphasis.

Section-II

UNIT-IV: Pulse Modulation : (8 Hrs)
Pulse amplitude modulation, Sampling theorem & type:Natural & flat top, PAM modulation circuit, PAM demodulation circuit, TDM and FDM, Crosstalk in TDM, pulse time modulation, generation of PTM signals (direct-indirect method), PWM modulator, PPM modulators, demodulation of PTM.

UNIT-V: AM Receiver: (7 Hrs)
Simplified block diagram of AM receiver, receiver parameters: Sensitivity, Selectivity,
BW, dynamic range, Tracking, fidelity, Types of AM receiver: TRF and superhetrodyne (block diagram), AM detection types: using diode, practical diode detector, distortion in diode detector. Negative peak clipping & diagonal clipping, Demodulation of SSB
using : product demodulator & diode balanced modulator, Automatic Gain Control (AGC).

UNIT-VI: FM Receiver : (6 Hrs)

Double conversion FM receivers, block diagram, FM demodulator, tuned circuit frequency discriminators, slope detectors, fosters seeley discriminator, ratio detectors, PLL-FM demodulators, FM noise suppression , Antenna: basic consideration radiation, Radiation mechanism, Elementary doublet.

UNIT-VII: Telephone System : (5 Hrs)

Introduction ,public switched telephone network , local loop signals and noise in the telephone system , digital transmission telephone network signaling , digital local loops.

Text Books:

1. George Kennedy 'Electronics Communication System'- IVth Edition-Tata McGraw Hill Publication.
2. Wayne Tomasi 'Electronics Communication System' -Fundamentals through Advanced.- Vth Edition- Pearson Education.

Reference Books:

1. R P Singh, S D Sapre 'Communication System-Analog & Digital' IInd Edition –Tata Mc Graw Hill Publication
2. Dennis Roddy, John Coolen.'Electronics Communications 'IVth Edition- Pearson Education
3. Louis E. Frenzel 'Principles of Electronic Communication System'- IIIrd edition - Tata McGraw Hill Publication

Term Work:

List of Experiments (Minimum 10):

1. Study Of Amplitude Modulation (A.M.)
2. Study Of AM Detection.
3. Study Of AM Receiver Characteristics.(Sensitivity, Selectivity & Fidelity)
4. Study Of Frequency Modulation.(F.M.)
5. Study Of FM Demodulation.
6. Sampling And Reconstruction.
7. Study Of Pulse Amplitude Modulation (PAM.)
8. Study Of Pulse Width Modulation.(PWM)
9. Study Of Pulse Position Modulation.(PPM)
10. Study Of PAM-TDM.
11. Study Of Antenna Parameters.
12. Study Of SSB Modulation & Demodulation.
13. Study Of DSB Modulation & Demodulation.
14. Visit To AIR (AM/FM).

Note:

1.Visit to AIR station/telephone exchange is compulsory. Students are supposed to attach report of visit to journal.

2. minimum two experiment based on simulation software (comsim)

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S.E. (Electronics and Telecommunication Engineering)
Semester -IV

MICROPROCESSOR AND PERIPHERALS

Teaching Scheme:	**Examination Scheme:**
Lectures: 3hr/week	Theory : 100 Marks
Practicals: 2hrs/week	Term Work : 25 marks
	POE : 50 marks

Section-I

UNIT-I: Introduction & Overview: **(6 Hrs)**

Review of number System: Binary, Decimal, Hex, Negative Number representation. Basic Structure of Computer system. Introduction to general purpose CPU, Architecture.

UNIT- II: Semiconductor Memories **(4 Hrs)**

Memory Capacity, Memory Organization, Speed, Memory Types-RAM, ROM, PROM, EPROM, EEPROM, Memory Address Decoding. Battery Backup.

UNIT- III: Interfacing Devices: **(15 Hrs)**

8205, 74138, 74373. Introduction to 8085, CPU Architecture, Register Organization, 8085 Instruction Set, Addressing modes. Stack & Subroutines, Instruction Cycle, machine Cycle, Timing Diagrams (Graphical representation), Wait, Hold & Halt States, and Interrupts of 8085(Hardware and software)

Section-II

UNIT- IV: Interfacing I/Os: **(5 Hrs)**

Concept of I/O ports, Memory mapped I/O and I/O mapped I/O schemes, I/O instructions, data Transfer Techniques, interrupt Driven I/O

UNIT V: Real World Interfacing: **(5 Hrs)**

Interfacing of Memory, keyboard, seven segment display, Relay, stepper motor,
Conversion techniques such as ADC Techniques: Dual Slope & Successive Approximation and DAC Techniques: Weighted resistor & R-2R Ladder

UNIT VI: Peripherals **(15 Hrs)**

- **a.** Programmable I/O- 8255
- **b.** Timer-8155
- **c.** Keyboard/Display Controller-8279
- **d.** ADC -0809/7109
- **e.** DAC- 0808

Reference Books:

1. Kenneth L Short –'Microprocessors and Programmed logic'
2. Douglas V Hall- 'Microprocessors and Digital Systems"
3. Ramesh S Gaonkar- 'Microprocessors Architecture, Programming and applications with 8085A.

Note to Paper setter:

- Question paper shall consist of approximately 80 % theory type questions(Hardware & design based problems) and approximately 20% Assembly language programs type questions (Algorithms/ Software's).

Term work: (minimum 12 experiment)

- 50% Assembly language programs based on Assembler & Simulator software's.
- 25% Assembly language programs based on Hardware (kit system)
- 25% Assembly language programs based on Interfacing (kit + Interfacing cards)

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S.E. (Electronics and Telecommunication Engineering)
Semester -IV

DATA STRUCTURES

Teaching Scheme:	**Examination Scheme:**
Lectures: 3hr/week	Theory : 100 Marks
Tutorial: 1hr/week	Term Work : 25 marks
Practical: 2hrs/week	

Section-I

UNIT-I: Introduction & Overview: **(1 Hrs)**
Introduction to theory of data structures & its data types,
Algorithms: complexity, time space trade-off with example.

UNIT- II: Arrays, Records & Pointers: **(6 Hrs)**
Introduction, linear arrays, representation of linear array in memory, traversing linear arrays, inserting & deleting,
Sorting: bubble sort, searching: linear search, binary search,
Multidimensional arrays, Pointers: pointer arrays, Records: Record structures, representation of records in memory, parallel arrays, matrices, space matrices.

UNIT III: Linked Lists: **(6 Hrs)**
Introduction, linked lists & its representation, Traversing & searching a linked list, memory allocation, Garbage collection, insertion & deletion of nodes of linked list, header linked list, two-way lists, programming problems.

UNIT IV : Stacks & Queues: **(6 Hrs)**
Introduction to stacks, stack as an Abstract Data type , representation through Arrays & linked lists , Applications of stacks , stacks & recursion, Queue as an abstract data type representation, cicular, double ended, priority, application of queues

Section-II

UNIT V: Trees : **(8 Hrs)**
Binary Tree: introduction, types, definition, properties, representations, operations, binary tree traversal reconstruction, counting number of binary trees, applications.
Advanced trees : AVL trees or height balanced trees, representation operation, Threaded binary trees, Expression trees. Multiway trees: trees , multiway search trees, B^+ trees, Heaps, construction of a Heap.

UNIT VI: Graphs: **(6 Hrs)**
Introduction, Graph theory terminology, sequential representation of graphs: Adjacency Matrix, Path matrix, Warshall's Algorithm, shortest paths, linked representation. Operations, Traversing, Posets, Topological sorting .

UNIT-VII: Hashing: **(3 Hrs)**
Hashing, Hash functions, collision, chaining

Text Books:

1. ISRD group –'Data structure using C '–- Tata McGraw Hill
2. Seymour Lipschautz –'Data structures' - Shaum's outlines -Tata McGraw Hill

Reference Books:

4. Langsam, Rubenstein, Tenenbaun –'Data structure using C & C++ ' - PHI
5. Mark Allen Weiss- 'Data structure & algorithm analysis in C'- 2nd edition –Pearson Education (LPE)
6. M.T. Goodrich, R. Tamassia, D. Mount- Data Structures & Algorithms in C++- Wiley Publication
7. A.N. Kathie-" Introduction to Data structures in C"- Pearson Education (LPE)

Term Work: Tutorial (Minimum 12 tutorials based on following)

Unit I	**01 tutorial**
Unit II	**02 tutorials**
Unit III	**03 tutorials**
Unit IV	**03 tutorials**
Unit V	**02 tutorials**
Unit VI	**01 tutorial**

Note: Tutorial should consist only algorithms.

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S.E. (Electronics and Telecommunication Engineering)
Semester- IV

Electromagnetic Fields

Teaching Scheme:
Lectures: 3 hr/week
Tutorial: 1 hr/week

Examination Scheme:
Theory : 100 Marks
Term Work: 25 Marks

Section-I

UNIT-I: Vector Analysis :- Vector Algebra, Co-ordinate systems, line, Surface & Volume Integral, Curl, Divergence & Gradient, Electric Charge, Coulomb's law, Charge distribution, Electric Field Intensity, field due to distributed charges. (6)

UNIT-II: Electric Flux & Potential: Flux density, Gauss's law, Gauss's law in point form, Applications of Gauss's law, Divergence Theorem, Energy of a moving charge in Electric Field, Potential & potential Difference , Potential field of a point charge, potential Gradient, Dipole, Energy density in Electrostatic field. (8)

UNIT-III: Dielectrics& Boundary conditions: Dielectrics, polarization, Boundary condition in perfect dielectrics, Method of Images, Point charge near an Infinite Grounded conducting plane, Lap lace's Equations. (6)

Section-II

UNIT-IV: Steady magnetic fields: Current & current Density piot savart law, stoke's Theorem, Ampere's Law , Magnetic flux & flux density, vector magnetic potential, Derivation of steady magnetic field laws, faraday's law (6)

UNIT-V: Electromagnetic waves: Maxwell's Equations in point form & Integral form for various fields, Retarded potential, Wave equation in free space, wave propagation through different medium, skin depth, poynting vector, Reflection of plane wave & standing wave ratio. (6)

UNIT-VI: Transmission Lines: Field Theory & circuit Theory, Transmission Line equations, Line parameters, Input impedance , The terminated uniform Transmission Line & VSWR, smith chart and applications. (8)

Text Books:

1) Engineering Electromagnetic _ W.H. Hyte
2) Elements of Electromagnetic fields - Surinder P.Seth (Dhanpat Rai Publications)

Reference Books:

1) Electromagnetic with applications - J.D. Kraus. (MGHpbs)-4th Edition.
2) Field & Wave Electromagnetics - David K. Cheng (pearon Education)

② Minimum 10 Tutorials based on above Topics

② Note for Paper setter: 50% Theory & 50% Problems are expected

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S.E. (Electronics and Telecommunication Engineering)
Semester -IV

Circuit Simulation

Teaching Scheme:	**Examination Scheme:**
Lectures: 1hr/week	Term Work: 25 Marks
Practical: 02hr/week	

UNIT-I: Schematic Design: (4 Hrs)

Introduction, Description of P-Spice, Types of analysis, Description of simulation software tools (like OrCAD / Proteus)

Schematic Description: Introduction, Input files, element values, Nodes, circuit elements, sources, output variables, format of circuit and output files, drawing the schematic, Design rule Check (DRC), Netlist details.

UNIT-II: Simulation: (4 Hrs)

Types of Analysis: Bias point, Time domain, AC Sweep, DC Sweep, Parametric, Monte Carlo, Noise analysis.

UNIT-III: PCB Design: (4 Hrs)

IC packages, Types of Connectors, Netlist for layout, Types of PCB's, Description of layout design tool, foot- print creation, Setting board parameter (board template, layer strategies), Component placement considerations, Routing strategies, Design Rule check, back annotation, post processing reports.

Text book:

1. M. H. Rashid 'Introduction to P-spice using OrCAD for circuits and Electronics' –Pearson Education

Reference Books:

1 . User manuals of PROTEUS, OrCAD, Multisim
2.. W.C. Bosshart 'Printed Circuit Boards-Design & Technology'–Tata McGraw-Hill Publication.

List of Experiments: (Minimum 8)

Sr. No.	Title of the Experiment
1	Schematic drawing & component symbol creation
2	Hierarchical schematic drawing
3	Simulation and analysis (bias point analysis, time domain, AC sweep, DC sweep, parametric) of :RLC Circuit
4	Simulation and analysis (bias point analysis, time domain, AC sweep, DC sweep, parametric) of : Transistorized Circuit
5	Simulation and analysis (bias point analysis, time domain, AC sweep, DC sweep, parametric) of : Two Stage Amplifier
6	Simulation and analysis IC Based Circuits
7,8,9	Experiments based on PCB design which would include component placement, setting design rules, auto routing and interactive routing.
10	Experiments based on noise analysis and Monte-carlo analysis

Note: Experiments may be based on the software's like OrCAD / PROTEL/ PROTEUS / MULTISIM etc.

Equivalence of Subject S.E. Part-I & II under the Faculty of Engineering & Technology w.e.f. Academic Year 2008-09

Part-I (Semester-III)

Sr. No.	S.E. Part-I Pre-revised	S.E. Part-I Revised
1	Engineering. Mathematics - III	Engineering. Mathematics - III
2	Electrical Machines and component	Electrical Machines and measurements
3	Electronics devices and circuits	Analog Electronic circuits & Design - I
4	Circuits and networks	Linear circuits
5	Digital techniques	Digital Design
6	Transducers and measurements	Electrical Machines and measurements

Part-II (Semester-IV)

Sr. No.	S.E. Part-II Pre-revised	S.E. Part-II Revised
1	Discrete circuit design	Analog Electronic circuits & Design - II
2	Principal of communication	Electronics Communication systems
3	Linear integrated circuits	Microprocessor and peripherals
4	Control systems	Data Structures
5	Electromagnetic Engineering.	Electromagnetic Fields.