PERIYAR UNIVERSITY

PERIYAR PALKALAI NAGAR

SALEM – 636011

DEGREE OF BACHELOR OF SCIENCE

CHOICE BASED CREDIT SYSTEM

Syllabus for

B.SC. ELECTRONICS AND COMMUNICATION

(SEMESTER PATTERN)

(For Candidates admitted in the Colleges affiliated to Periyar University from 2017 - 2018 onwards)

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REGULATIONS

1. ELIGIBILITY :

Refer this office circular No: PU/R/AD-1/UG/PG/Programmes Eligibility/2019 Dated: 16-04-2019.

2. DURATION OF THE COURSE :

The course for the degree of Bachelor of Electronics and Communication shall consist of three academic years divided into six semesters. Each semester will be of of 90 working days.

3. COURSE OF STUDY :

The course of study shall comprise instruction in the following subjects under CBCS (Choice Based Credit System) pattern according to the syllabus and books prescribed from time to time.

FOUNDATION SUBJECTS :

PART I : Tamil /Hindi/Malayalam/ French / German

PART II : English

ALLIED SUBJECTS : IN THE FIRST YEAR ONE MAJOR

Department out of the four mentioned below ; to be chosen for the study of two allied papers. In the second year another major department in the list to be chosen for the study of another two allied papers.

SEMESTER	MAJOR DEPARTMENT	ALLIED SUBJECT
1/III	STATISTICS	BUSINESS MATHS & STATISTICS - I
I/III	MATHS	ALGEBRA , CALCULUS & FOURIER SERIES
I/III	PHYSICS	ALLIED PHYSICS - I
I/III	COMPUTER SCIENCE	PROGRAMMING IN C
II/ IV	STATISTICS	BUSINESS MATHS & STATISTICS - II
II/IV	MATHS	DIFFERENTIALEQUATIONS AND LAPLACE TRANSFORMS
II/IV	PHYSICS	ALLIED PHYSICS - II
II/IV	COMPUTER SCIENCE	PROGRAMMING IN VISUAL BASIC
II		ALLIED LAB - I FOR ALLIED I & II
IV		ALLIED LAB - II FOR ALLIED III & IV

5. SCHEME OF EXAMINATIONS

The scheme of examinations under CBCS (Choice Based credit System) for different semesters shall be as follows .

SEMESTER I

PART	SUBJECT	SUBJECT TITLE	TOTAL HOURS		CREDITS	TOTAL		
			L	T/P		CIA	EA	MARKS
I	Language	Tamil - I @	6		3	25	75	100
II	Language	English - I	6		3	25	75	100
III	Core - I	Semiconductor Devices	5		4	25	75	100
III	Core Pract.- I	Basic Electronics Lab	1	2				
III	Allied I		4		4	25	75	100
III	Allied Lab - I		2					
IV	SBEC-I	Applied Electric Circuits	2		2	25	75	100
IV	Value Education		2		2	25	75	100

SEMESTER II

PART	SUBJECT	SUBJECT TITLE	TOTAL HOURS		CRE-DITS	TOTAL		
			L	T/P		CIA	EA	MARKS
I	Language	Tamil - II @	6		3	25	75	100
II	Language	English - II	6		3	25	75	100
III	Core - II	Applied Digital Electronics	5		4	25	75	100
III	Core Pract.-I	Basic Electronics Lab	1	2	4	40	60	100
III	Allied-II		4		4	25	75	100
III	Allied Lab - I			2	2	40	60	100
IV	SBEC-II	Power Electronics	2		2	25	75	100
IV	EVS	Environmental Studies	2		2	25	75	100

SEMESTER III

PART	SUBJECT	SUBJECT TITLE	TOTAL HOURS		CRE-DITS	TOTAL		
			L	T/P		CIA	EA	MARKS
I	Language	Tamil - III @	6		3	25	75	100
II	Language	English - III	6		3	25	75	100
III	Core III	Electronic Circuits	4		4	25	75	100
III	Core Pract.-II	Electronic Circuits Practical	1	2				
III	Core Pract.-III	8085 Microprocessor	1	2				
III	Allied III		4		4	25	75	100
III	Allied Lab - II		2					
IV	NMEC - I	(From Group A) #$	2		2	25	75	100

SEMESTER IV

PART	SUBJECT	SUBJECT TITLE	TOTAL HOURS		CREDITS	TOTAL		
			L	T/P		CIA	EA	MARKS
I	Language	Tamil - IV @	6		3	25	75	100
II	Language	English - IV	6		3	25	75	100
III	Core IV	8085 Microprocessor and Interfacing	4		4	25	75	100
III	Core Pract. II	Electronic Circuits Lab	1	2	4	40	60	100
III	Core Pract. III	8085 Microprocessor and Interfacing Lab	1	2	4	40	60	100
III	Allied IV		4		4	25	75	100
III	Allied Lab - II			2	2	40	60	100
IV	NMEC II	(From Group B) #$	2		2	25	75	100

SEMESTER V

PART	SUBJECT	SUBJECT TITLE	TOTAL HOURS		CREDITS	TOTAL		
			L	T/P		CIA	EA	MARKS
III	Core V	Electronic Communication Systems	5		5	25	75	100
III	Core VI	Ic's & Their Applications	5		5	25	75	100
III	Elective I	From Group A	5		5	25	75	100
III	Elective II	From Group B	5		4	25	75	100
III	Core Pract-IV	IC'S & Communication Lab	1	2				
III	Core Pract-V	From Group D	1	2				
IV	SBEC III	Electronic Instrumentation	2		2	25	75	100
IV	SBEC IV	Competetive Skills	2		2	25	75	100

SEMESTER VI

PART	SUBJECT	SUBJECT TITLE	TOTAL HOURS		CRE-DITS	TOTAL		
			L	T/P		CIA	EA	MARKS
III	Core VII	PC HW Networking & Troubleshooting	5		5	25	75	100
III	Core VIII	Network Communication & Security	5		5	25	75	100
III	Elective III	From Group C	5		5	25	75	100
III	Core Pract. IV	IC'S & Communication Lab	1	2	4	40	60	100
III	Core Pract. V	From Group D	1	2	4	40	60	100
III	Core IX	Biomedical Instruments (or) Project Viva Voce *	5		5	25	75	100
IV	SBEC V	Audio & Video Systems	2		2	25	75	100
IV	SBEC VI	Life Development Skills	2		2	25	75	100
V	Extension Activities	(NCC/NSS/YRC/Sports Etc.)			1			
		Total Credits & Marks			**140**			**4100**
*		**No Internal Mark For Project Work**						
		Project Report Evaluation	**80**	**Marks**				
		Viva Voce Evaluation	**20**	**Marks**				

@ Any other Language like Hindi/Malayalam/French/etc .

#$ Those who have not studied Tamil upto XII std and taken a Non Tamil language under part-I shall take Tamil comprising of two courses (level will be at 6th standard) instead of NMEC

#$ Those who have studied Tamil upto XII std and taken a Non Tamil language under part-I shall take Advanced Tamil comprising of two courses instead of NMEC.

6. QUESTION PAPER PATTERN FOR ALL UG COURSES

MARK DISTRIBUTION FOR THEORY (EXTERNAL)

TIME : 3 HOURS; MAXIMUM MARKS : 75 ;

PASSING MINIMUM : 30 MARKS

Part A 10x2 =20

(Answer All Questions)

(Two Questions from Each Unit) Part B 5x5=25

(Answer All Questions)

(One Question from Each Unit with internal Choice) Part C 3x10=30

(Answer Any THREE Questions)

(One Question from Each Unit)

Mark Distribution for Theory (Internal)

Max. Marks : 25 Passing Minimum : 10 Marks

Subject Level Cycle Test And Model Exam	:	15
Subject Level Assignment	:	5
Subject Level Attendance	:	5
Total	**:**	**25**

MARK DISTRIBUTION FOR PRACTICALS (EXTERNAL)

TIME : 3 HOURS ; MAXIMUM MARKS : 60 ; PASSING MINIMUM : 24 MARKS

PRACTICAL EXAM : 50 MARKS & RECORD : 10 MARKS

Submission of Record Note Books for Practical Exams : Candidates appearing for the Practical Exams must submit Bonafide Record Note Book, otherwise the candidate will not be permitted to appear for the practical exam**.**

Mark Distribution for Practicals (Internal)

Max. Marks : 40 Passing Minimum : 16 Marks

Year Through ; Lab Performance	:	10
Model Practicals	:	20
Year Through ; Lab Attendance	:	10
Total	**:**	**40**

7. PROJECT WORK OR ONE CORE PAPER :

A Candidate can submit **SOFTWARE or HARDWARE or HARDWARE cum SOFTWARE** based project and has to demonstrate the Project with Project Report in the University Project Viva Voce Examination conducted at the end of the sixth semester.

MARK DISTRIBUTION FOR PROJECT REPORT : 80 MARKS

MARK DISTRIBUTION FOR VIVA VOCE: 20 MARKS

Instead of Project Work ; Core Paper – IX "BIOMEDICAL INSTRUMENTS " may be offered in the VI th Semester.8. PASSING MINIMUM : A candidate shall be declared to have passed the examination only if the candidate secures a minimum of 40% in the University examination and with an overall total of 40 out of 100 .

9. RESTRICTIONS TO APPEAR FOR THE EXAMINATIONS

Candidates who fail in any of the course of Part I , II , III , IV & Part V of UG Degree examinations shall complete the course concerned within 5 years from the date of admission to the said programme and should they fail to do so, they shall take the examination in the revised syllabus prescribed for the immediate next batch of candidates.

If there is no change in the syllabus they shall appear for the examination in that course with the syllabus in vogue until there is a change in the syllabus. In the event of removal of that course consequent to change of regulation and / or curriculum after 5 year period, the candidates shall have to take up an equivalent course in the revised syllabus as suggested by the Chairman and fulfill the requirements as per the regulation curriculum for the award of the degree.

10. IMPROVEMENT OF MARKS IN THE SUBJECTS ALREADY PASSED

Candidates desirous of improving the marks awarded in a passed subject in their first attempt shall reappear once within a period of subsequent two semesters. The improved marks shall be considered for classification but not for ranking. When there is no improvement, there shall not be any change in the original marks already awarded.

11. CLASSIFICATION OF SUCCESSFUL CANDIDATES

A candidate who passes all the examinations in Part I to P art V securing following CGPA and Grades shall be declared as follows for Part I or Part II or Part III.

CGPA	GRADE	CLASSIFICATION OF FINAL RESULT
9.5 - 10.0	O +	First Class -Exemplary
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	Third Class
4.0 and above but below 4.5	C	

12. RANKING

A candidate who qualifies for the UG degree course passing all the examinations in the first attempt, within the minimum period prescribed for the course of study from the date of admission to the course and secures I or II class shall be eligible for ranking and such ranking shall be confined to

10% of the total number of candidates qualified in that particular branch of study ; subject to a maximum of 10 Ranks. The improved marks shall not be taken into consideration for ranking.

13. COMMENCEMENT OF THIS REGULATION :

These regulations shall take effect from the academic year 2017-2018, i.e., for students who are to be admitted to the first year of the course during the academic year 2017-2018 and thereafter.

14. COURSE EQUIVALENCE :

The Three Year Course in the Bachelor of Science in Electronics & Communication is Equivalent to :

- B.Sc. Electronics
- B.Sc. Industrial Electronics
- B.E.S. (Bachelor of Electronic Science)

15. COURSE OBJECTIVES :

The syllabus of B.Sc., Electronics and Communication is enriched and necessary changes have been made in the course pattern and papers.This will enable the students to acquire the **Basic & Fundamental Knowledge In Both Theory And Practicals.**

16. ACADEMIC OPPORTUNITIES :

After successful completion of this course ; students can pursue higher degree courses like M.Sc., (Electronics) / M.Sc., (Electronic Science) / M.Sc., (Applied Electronics) / M.Sc., (Electronics & Instrumentation) / M.Sc., (Cyber Forensics & Information Security) M.Sc., (Criminology & Criminal Justice Science) / M.Sc., (Computer Science) / MCA / M.Sc., (Nano Science and Technology) / M.Sc., HRD Psycholgy / M.Sc., (Energy Science) / M.Sc., Environomental Science) / M.Sc., Library & Information Science) / M.Sc., YOGA / MBA / MA., (Defense & Strategic Studies / MA., Yoga / MA., Public Administration / MA., Political Science etc

17. JOB OPPORTUNITIES :

The Students are eligible for placement in Army , Navy , Airforce , Civil Aviation Sectors, Space & Radio Astronomy Sectors , T.V. Broad Casting Stations , All India Radio, BSNL , TNEB , ITES (IT Enabled Software Services) , Telecommunication Sectors, Banking and Railway Services and as Computer Hardware & Instrument Service Professionals. A Wide variety of Self – Employment Opportunities are also available.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER I

CORE I - SEMICONDUCTOR DEVICES

UNIT-I:

Structure of Atom - Atomic Number - Valence Electrons - Bonding in Conductors - Insulators - Semiconductors - Energy Band Diagram of Conductors - Insulators - Semiconductors - Intrinsic Semiconductor - Extrinsic Semiconductor - P Type Semiconductor - N type Semiconductor - Carrier Life Time.

UNIT - II : Theory of PN Junction Diode - Energy Band Structure - Diode Current Equation - Diode Resistance - Depletion Capacitance - Diffusion Capacitance - Effect of Temperature - PN Junction Diode as a Rectifier - Zener Diode - Avalanche Break Down - Zener Break Down - Zener Diode as a Voltage Regulator.

UNIT - III :

Operation of PNP & NPN Transistor - CB , CE , CC Configuration and Characteristics - Transistor as an Amplifier.

UNIT - IV :

Construction - Operation - Output & Transfer Characteristics of P Channel & N Channel JFET - Characteristic Parameters of the JFET - Biasing the FET - Comparison of JFET & BJT - Comparison of P Channel & N Channel JFET - Applications of JFET - JFET as a Voltage Variable Resistor.

UNIT-V:

Construction, Operation, Output & Transfer Characteristics of P Channel & N Channel Depletion MOSFET - Construction, Operation, Output & Transfer Characteristics P Channel & N Channel Enhancement MOSFET - Biasing the MOSFET - Comparison of P Channel MOSFET with N Channel MOSFET - Comparison of JFET with MOSFET - Handling Precautions for the MOSFET.

REFERENCE BOOKS :

1. Electronic Devices & Circuits - Salivahanan - TMH - 2nd Edition

2. A Text Book of Applied Electronics - R.S. Sedha - S. Chand.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTR - I

SKILLED BASED ELECTIVE COURSE

SBEC I - APPLIED ELECTRIC CIRCUITS

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

Unit I - CIRCUIT COMPONENTS :

Resistors, Capacitors & Inductors in Series and Parallel - Factors governing the Resistance of a Resistor, Capacitor & Inductor - Colour Coding of Resistors - Energy Stored in a Capacitor - Energy Stored in an Inductor – Various Other Passive & Active Devices - Simple Problems.

Unit-II : CIRCUIT LAWS :

Ohms Law - Kirchoff's Voltage Law - Kirchoff's Current Law - Current Division - Voltage Division - Star Connection - Delta Connection - Series Circuits - Parallel Circuits - Series & Parallel Circuits - Open Circuit - Short Circuit - Simple Problems.

Unit III - THEOREMS :

Super Position Theorem – Thevenin's Theorem – Norton's Theorem – Millman's Theorem Maximum Power Transfer Theorem – Simple Problems

Unit IV - AC CIRCUIT BASICS :

Sinusoidal and Non Sinusoidal Waveforms – Peak Value – Peak to Peak Value – Average Value – RMS Value – Period and Frequency Measurement - Power Factor - Real Power – Reactive Power – Simple Problems.

Unit V : REACTANCE , IMPEDANCE & RESONANCE :

Capacitive Reactance – Inductive Reactance – Impedance – RL and RC in Series and Parallel – RLC in Series and Parallel – Series Resonance - Parallel Resonance - Simple Problems

REFERENCE BOOKS :

1. Circuits And Networks : Analysis And Synthesis - Sudhakar & Shyam Mohan - TMH - IV Edition
2. Basic Electronics – Bernard Grob – Mcgraw Hill.
3. Circuit Theory – Salivahanan – S.Chand – Rs.395/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER II

CORE II - APPLIED DIGITAL ELECTRONICS

UNIT I - NUMBER SYSTEMS :

Binary Signals – Binary Number System – Decimal Number System - Octal Number System – Hexadecimal Number System – Conversion from One Number System to Another Number System - BCD – Gray code – Excess – 3 Code – ASCII code.

UNIT II - BOOLEAN ALGEBRA :

Binary Addition, Subtraction, Multiplication & Division - 1's and 2's Complement Subtraction - 9's & 10's Complement Subtraction - Basic laws of Boolean Algebra - Duality Theorem – De Morgan's Theorem - Sum of Products – Product of Sum - Two Variable, Three Variable & Four Variable Karnaugh Maps.

UNIT III - COMBINATIONAL ELEMENTS :

Logic Gates : AND, OR, NOT, EX-OR, EX-NOR, NAND & NOR - Logic Gates using Discrete Components - NAND & NOR as Universal Gates - Half & Full Adder – Half & Full Subtractor - Encoder - Decoder - Multiplexer - Demultiplexer - Implementation using 74147, 7442, 74153 & 74155 IC's.

UNIT IV - SEQUENTIAL ELEMENTS :

Flip Flops : RS - Clocked RS - JK - Master Slave JK - D & T Flip Flops – Shift Registers : SIPO – SISO – PIPO – PISO – Shift Left – Shift Right - Ring counter – Twisted Ring Counter . Counters : Hexadecimal Up - Hexadecimal Down - Modulo Up - Modulo Down - UP/DOWN Counters - Implementation Using 7476, 7495, 7493 & 7490 IC's.

UNIT V - ADC AND DAC'S :

Parallel Comparator Type of ADC - Counter Ramp Type of ADC - Successive Approximation Type of ADC - Dual Slope Type of ADC - ADC Accuracy and Resolution - Binary weighted Resistor type of DAC - R-2R Ladder Type of DAC - DAC Accuracy and Resolution - Implementation using ADC 0809 & DAC 0800 IC's.

REFERENCE BOOKS :

1. Fundamentals of Digital Circuits – Anand Kumar – PHI – II Edition – Rs.375/-
2. Digital Circuits and Design - Salivahanan – S.CHAND - IV Edition –Rs.450/-
3. Digital Principles and Application - Malvino and Leach – TMH
4. A Text Book of Digital Electronics – RS Sedha – S.Chand – Rs.475/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER II

SKILLED BASED ELECTIVE COURSE

SBEC II - POWER ELECTRONICS

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT I :

Simple Theory & Characteristics of SCR - DIAC, TRIAC - UJT. UJT as an Oscillator.

UNIT II - METHODS OF TURN ON & TURN OFF :

AC gate Triggering - R Triggering - RC Triggering - DC gate Triggering - Pulse gate Triggering - Natural Commutation - Force Commutation - Self

- Impulse - Resonant - Complementary - External -Load side - Line Side.

UNIT III :

Triggering of series connected SCR's - Triggering of Parallel Connected SCR's – Current & Voltage Protection - Snubber Circuit.

UNIT IV - STATIC SWITCHES :

Single Phase AC Switches - Three Phase AC Switches - Three Phase Reversing Switches - AC Switches for Bus Transfer - DC Switches - Solid State Relays.

UNIT V - POWER SUPPLIES :

Switched mode DC Power Supplies - Resonant DC Power Supplies - Bidirectional Power Supplies - Switched mode AC Power Supplies - Resonant AC Power Supplies - Bidirectional AC Power Supplies.

REFERENCE BOOKS :

1. Power Electronics - Muhammed H. Rashid - PHI - 2nd Edition
2. Power Electronics – Jaganathan – PHI – II Edition – Rs.275/

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER I & II

CORE PRACTICAL I - BASIC ELECTRONICS LAB

(ANY HARDWARE BASED SIMULATION TOOL MAY ALSO BE USED)

(Any 22 Experiments)

1. Colour Coding of Resistors
2. PN Junction Diode Characteristics.
3. Zener Diode Characteristics.
4. CE Input Characteristics.
5. CE Output Characteristics.
6. SCR / TRIAC Characteristics.
7. DC Regulated Power Supply Using Zener Diode.
8. Verification of Ohm's Law.
9. Verification of Kirchoff's Current Law.
10. Verification of Kirchoff's Voltage law.
11. Verification of Thevenin's Theorem & Norton's Theorem.
12. Verification of Millman's Theorem
13. Verification of Maximum Power Transfer Theorem
14. Inductance Calculation Using Series or Parallel Resonance.
15. Transient Response of an RC Circuit.
16. Truth Table Verification of Basic Gates (Any Two)
17. Logic Gates Using Discrete Components (Any One).
18. +5V Regulated Power Supply.
19. NAND or NOR as a Universal Gate (Any One Gate).
20. Verification of De Morgan's Theorem.

21. Truth Table Verification of Half Adder & Full Adder
22. Truth Table Verification of Half Subtractor & Full Subtractor.
23. Encoder Using 74147 IC
24. Decoder Using 7442 IC
25. Multiplexer Using 74153 IC
26. Demultiplexer Using 74155 IC
27. MS JK Flip Flop Using 7476 IC
28. Parallel In Parallel Out Shift Register Using 7495 IC
29. Up Counter Using 7490 IC or 7493 IC.
30. Clock Generation Using NAND or NOR Gate.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER III

CORE III - ELECTRONIC CIRCUITS

UNIT - I : POWER S UPPLY's :

Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Average value - RMS value - Form factor - Peak factor - Ripple factor - Efficiency - TUF - PIV - Filters : C, L, LC, CLC, CRC – Voltage Regulators : Series Regulators - Shunt Regulators - IC Voltage Regulators (78XX & 79XX).

Unit - II :

Bias Stability - Thermal runaway - Methods of transistor Biasing - Bias compensation - Wave Shaping Ciruits – RC & RL Circuits – Clipping & Clamping Circuits – Voltage Doubler – Tripler – Quadrupler.

Unit - III : AMPLIFIERS :

Class A Amplifier - Class B Amplifier - Class AB Amplifier - Push Pull Amplifier - Complementary symmetry Push Pull Amplifier - Class C Amplifier – Multistage Amplifiers : RC Coupled Amplifier - Transformer Coupled Amplifier - Direct Coupled Amplifier.

UNIT - IV : FEEDBACK AMPLIFIERS :

Basics concepts of Feedback - Effects of negative feedback on gain, Bandwidth, Distortion, Noise, Input Impedance and Output Impedance - Types of Negative Feedback - Voltage Series - Voltage Shunt - Current Series and Current Shunt Feedback.

UNIT : V : SINUSOIDAL & NON SINUSOIDAL OSCILLATORS :

Classification of Oscillators - Barkhausen Criterion - Hartley Oscillator - Colpitt Oscillator - Clapp Oscillator - Phase Shift Oscillator - Wein Bridge - Crystal Oscillator - Frequency stability of Oscillators - Astable Multivibrator - Monostable Multivibrator Bistable Multivibrator - Schmitt Trigger.

REFERENCE BOOKS :

1. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition

2. A Text Book of Electronic Devices & Circuits – R. S. Sedha – S.Chand Rs.325/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER III

NON MAJOR ELECTIVE COURSE I

NMEC I - PAPER I - BASIC ELECTRONICS – I

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT - I : SEMICONDUCTOR THEORY :

Intrinsic Semiconductor – Extrinsic Semiconductor - Theory of PN Junction Dode - Zener Diode - Avalanche Breakdown - Zener Break Down - Operation of PNP & NPN Transistor - CB , CE , CC Configuration and Characteristics - Transistor as an Amplifier.

UNIT - II : ELECTRONIC COMPONENTS :

Simple Theory & Use of : Resistors, Capacitors, Inductors, Diodes, Zener diodes, Transistors, FET, MOSFET, UJT, SCR, DIAC, TRIAC, LED, Seven Segment Display, Basic Gate IC's, Transformers, LDR, Switches, Microphone, Loudspeaker, Buzzers, Fuse.

UNIT - III : CIRCUIT LAWS :

Ohm's Law - Kirchoff's Current Law - Kirchoff's Voltage Law - Voltage Division - Current Division - Series Circuits - Parallel Circuits - Series & Parallel Circuits - Open Circuit - Short Circuit.

UNIT - IV : RESISTORS , CAPACITORS & INDUCTORS :

Resistors, Capacitors & Inductors in Series and Parallel - Factors governing the Resistance of a Resistor, Capacitor & Inductor - Colour Coding of Resistors - Energy Stored in a Capacitor - Energy Stored in an Inductor.

UNIT - V : WAVEFORMS :

Sinusoidal Waveform - Non-Sinusoidal Waveforms - Peak Value - Peak to Peak Value - Average Value - RMS Value – Period & Frequency Measurement.

REFERENCE BOOKS :

1. Electronic Devices & Circuits - Salivahanan - TMH - 2nd Edition
2. Principles of Electronics- V.K. Mehta - S. Chand.
3. Circuits & Networks - Sudhakar - TMH - 4th Edition.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER III

NON MAJOR ELECTIVE COURSE I

NMEC I - PAPER II - BIO MEDICAL ELECTRONICS – I

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT I :

Introduction to Human Physiology – Micro Electrodes – Skin Surface Electrodes – Needle Electrodes – Reference Electrodes .

UNIT II : METERS & RECORDERS :

Digital Thermometer – Sphygmo Manometer - Electronic Sthethoscope – ECG - EEG – EMG .

UNIT III :

– Cardio Tocography - Electro Oculography - Electro Retinography - Poly Somnography - Spirometer - Blood Flow Meter - Doppler – Audiometer

UNIT IV : OPERATION THEATRE EQUIPMENTS :

- Upper Endoscope - Lower Endoscope - ENT Endoscope -

UNIT V :

Diathermy - Surgical Diathermy- Micro Wave Diathermy - Multipara Patient Monitor .

REFERENCE BOOKS :

1. Biomedical Instrumentation & Measurements – Ananda Natarajan – PHI - Rs.275/-
2. Biomedical Instrumentation And Measurements - Leslie Cromwell - PHI - 2nd Edition.
3. Bio-Medical Instrumentaion - Dr.M.Arumugam - Anuradha Agencies - 2nd Edition
4. Handbook of Biomedical Instrumentation - R.S.Khandpur - TMH
5. Medical Instrumention, Application And Design – John G.Webster – WEL - 3rd Edition
6. A Text Of Book Of Medical Instruments – Ananthi – New Age International – Rs.275/-
7. Internet : Additional Reference For All Units.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER III

NON MAJOR ELECTIVE COURSE I

NMEC I - PAPER III - CELLULAR PHONES

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

Unit - I : BASICS

Working of a Telephone - Local Exchange - Initiating a call - Calling a Number - Making a Connection - Answering a Call - Conversation - Ending a Call - Hook Switch - Transmitter - Receiver - Ringer - Cellular Mobile Telephone System - Mobile Phone Service Area - Mobile Fraud Call.

Unit - II : ACCESS TECHNOLOGIES

GSM - CDMA - GPRS - EDGE - WCDMA - UMTS - HSDPA - Satellite Phones - GPS - Mobile Browsers - WAP.

Unit - III :

Types of : Wireless Options, Batteries, Memory Cards, Messaging, Ring Tones, Keypad Types, Display Types. Handset Form Factor - SMS Abbreviations - Mobile OS.

Unit - IV :

Hardware/Software Repairing - Various Locks - Installation of : UFS Driver, UFS Suite & Flashing Files - IMEI Number Detection - Mobile GSM Utility Codes (Any Five of Nokia Set)

Unit V - OTHER MOBILE SERVICE TOOLS :

Ultrasonic Cleaner - Computer Connectors - SIM Card Reader - Memory Card Reader - Mobile Virus - Virus Prevention - Removing Virus - Health Hazards with Mobiles - SAR.

REFERENCE BOOKS :

1. Modern Mobile Phone Introduction & Servicing - Manahar Lotia - BPB - Rs.75/- (Unit - I)
2. Modern Mobile Phone Repair Using Computer Software & Service Devices - Manahar Lotia - BPB - 120/- (Units I, IV & V)
3. Modern Mobile Phone Unlocking & Utility Codes For GSM & CDMA Phones - Manahar Lotia - BPB - Rs.99/- (Unit - IV).
4. Mobile Telephony - Digit Magazine - Supplement - Jan 2006 - Jasubhai Digital Media Publications. (Unit II & III)
5. Blue Tooth Technology – CSR Prabhu & A Prathap Reddi – PHI - Rs.250/-
6. Mobile & Personal Communication Systems & Services - Raj Pandya - PHI – Rs.250/-
7. INTERNET : ADDITIONAL REFERENCE FOR ALL UNITS.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER IV

CORE IV - 8085 MICROPROCESSOR & INTERFACING

UNIT I - 8085 MICROPROCESSOR :

Signals on 8085 – Architecture of 8085 – Demultiplexing the Bus - Generating Control Signals – Fetching, Decoding and Execution of an Instruction– Memory Mapping for a 8K Memory Chip - Study of EPROM (2764) & Study of RWM (6264).

UNIT II - INSTRUCTION SET :

Data Transfer – Arithmetic – Logical – Branching - Machine Control Instructions - Stack & Stack Operations - Simple Programs.

UNIT III :

Addressing Modes - Instruction Format - Memory Read Machine Cycle (MOV C,A & MVI A,32) - Memory Write Machine Cycle (MVI M, 48) - Timing Diagram of IN & OUT Instruction - Interrupt System of 8085.

UNIT - IV :

Time Delay Program – Signals on 8255 – I/O Mode – BSR Mode - Interfacing With : Switches & Matrix Keyboard .

UNIT-V:

Interfacing With : LED'S - Single & Multiple Seven Segment Displays - LCD - ADC 0809 - DAC 0800 – Stepper Motor - Traffic Light Control System .

REFERENCE BOOKS :

1. Microprocessor Architecture, Programming and Applications With the 8085/8080A – Ramesh.S Gaonkar - New Age International – 5th Edition.
2. Introduction to Microprocessor -AP Mathur - TMH – 3rd Edition
3. Microprocessor and its Applications – S. Malarvizhi – Anuradha Publications
4. Fundamentals of Microprocessors and Micro Controllers – B.Ram – Dhanpat Rai – IV th Edition

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER III & IV

CORE PRACTICAL II - ELECTRONIC CIRCUITS LAB

(ANY HARDWARE BASED SIMULATION TOOL MAY ALSO BE USED)

(Any 22 Experiments)

1. Amplitude and Frequency Measurement Using CRO
2. Half Wave Rectifier With Capacitor Filter
3. Full Wave Rectifier With Capacitor Filter
4. Bridge Rectifier With Capacitor Filter
5. Series Regulator or Shunt Regulator
6. Regulated Dual Power Supply Using 78XX & 79XX
7. Positive & Negative Clipping at 0V
8. Positive & Negative Clamping at 0V
9. Voltage Doubler / Voltage Tripler / Voltage Quadrupler
10. Basic Differentiator & Basic Integrator
11. Study of Tank Circuit
12. Hartley Oscillator Using Transistor
13. Colpitt's Oscillator or Clapp Oscillator Using Transistor Phase Shift
14. or Wein Bridge Oscillator Using Transistor Crystal Oscillator Using
15. Transistors
16. UJT as an Oscillator.
17. Astable Multivibrator Using Transistors
18. Monostable Multivibrator Using Transistors. Bistable
19. Multivibrator Using Transistors
20. Schmitt Trigger Using Transistors.
21. Single Stage RC Coupled Amplifier. Two

22. Stage RC Coupled Amplifier.
23. Emitter Follower.
24. Push Pull Complementary Symmetry Emitter Follower.
25. Power Amplifier Using LM 380 IC.
26. Firing Angle Control Using SCR (Half Cycle / Full Cycle) .
27. Lamp Dimmer
28. Automatic Street Light Control.
29. Transistor Chopper.
30. Burglar Alarm or Fire Alarm
31. Power Transistor Inverter (40W / 20W)
32. Commutation Techniques (Any Two)

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER III & IV

CORE PRACTICAL III

(ANY EMBEDDED BASED SIMULATION TOOL MAY ALSO BE USED)

(Any 22 Experiments)

8085 MICROPROCESSOR & INTERFACING LAB

1. Addition of Two ; 8 Bit Numbers.
2. Subtraction of Two ; 8 Bit Numbers
3. Multiplication of Two ; 8 Bit Numbers
4. Division of Two ; 8 Bit Numbers
5. BCD Addition
6. BCD Subtraction
7. FILL
8. BLOCK MOVE
9. 1's & 2's Complement of a 16 Bit Number.
10. Smallest / Largest of ; N Numbers.
11. Ascending / Descending Order of ; N Numbers.
12. Sum of N ; 8 Bit Numbers.
13. Multi Byte Addition.
14. 3 Digit Decimal to Two digit Hexadecimal Conversion.
15. Two digit Hexadecimal to 3 digit Decimal Conversion.
16. ADC Interface.
17. DAC Interface.
18. Waveform Generation Using DAC.
19. Stepper Motor Interface.

20. Interface With Switches
21. Hex Keyboard Interface.
22. Interface With LED's.
23. Interface With Single Seven Segment Display.
24. Interfacing With Multiple Seven Segment Displays.
25. Interface With LCD's.
26. Interfacing With Solid State Relay.
27. Moving Display.
28. Blinking Display.
29. Digital Clock.
30. Traffic Light Control.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER IV

NON MAJOR ELECTIVE COURSE

NMEC II - PAPER I

BASIC ELECTRONICS – II

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT I - NUMBER SYSTEMS :

Introduction - Binary Number System - Octal Number System - Decimal Number System - Hexadecimal number system - Conversion from one system to another - Binary Addition - Binary Subtraction - Binary Multiplication - Binary Division - 1's & 2's Complement Subtraction - 9's & 10's Complement Subtraction.

UNIT II :

Logic GATES - NAND as a UNIVERSAL GATE - NOR as a UNIVERSAL GATE - Basis Laws of Boolean Algebra - Principle of Duality – De Morgan's Theorem.

UNIT III - COMBINATIONAL ELEMENTS :

Half Adder - Full Adder - Half Subtractor - Full Subtractor - Encoder - Decoder - Multiplexer - Demultiplexer.

UNIT IV - PO WER S UP PLY' s :

Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Capacitor Filter - Fixed IC Regulated Power Supply using 78XX - Dual IC Regulated Power Supply using 78XX & 79XX – SMPS – UPS.

UNIT V :

Use of Multimeter - Resistance Measurement - AC & DC Voltage Measurement - AC & DC Current Measurement - Testing of Diodes & Transistors - Use of CRO - Frequency and Amplitude Measurement - Use of : Strip Board, Bread board, Soldering Rod - Function Generator - Power supplies - Resistance Box - Capacitance Box - Inductance Box.

REFERENCE BOOKS :

1. Digital Circuits & Design– Salivahanan-Vikas Pub - III Edition.
2. Electronic Devices & Circuits - Salivahanan - TMH - 2nd Edition
3. Principles of Electronics - V.K. Mehta - S. Chand.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER IV

NON MAJOR ELECTIVE COURSE

NMEC II - PAPER II

BIO MEDICAL ELECTRONICS – II

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT I : INTENSIVE CARE EQUIPMENTS :

Pulse Oximeter - Block Diagram & Sensor – Ventilator – Cardiac Monitor - ECG Holder - Defibrillator

UNIT II :

Pace Maker : Implantable and External Pacemakers - Infant Warmer - Infant Incubator - Baby Phototherapy – Nebulizer .

UNIT III : MODERN IMAGING SYSTEMS :

Ultra Sound Scanner - Color Doppler - X-Ray Machine .

UNIT IV :

C-Arm - CT Scan – MRI Scan – Angiography - LASER in Medical Applications.

UNIT V - ELECTRICAL SAFETY OF MEDICAL INSTRUMENTS :

Radiation safety - Physiological Effects Due to 50 Hertz Current Passage - Micro Shock - Macro Shock - Electrical Accidents in Hospitals - Devices to Protect Against Electrical Hazards - SMPS in Medical Equipments.

REFERENCE BOOKS :

1. Biomedical Instrumentation & Measurements – Ananda Natarajan – Phi - Rs.275/-
2. Biomedical Instrumentation and Measurements - Leslie Cromwell - Phi - 2nd Edition.
3. Bio-medical Instrumentaion - Dr. M. Arumugam - Anuradha Agencies - 2nd Edition .
4. Handbook of Biomedical Instrumentation - R.S. Khandpur – TMH .
5. Medical Instrumention, Application and Design – John G. Webster - Wel - 3rd Edition
6. A Text of Book of Medical Instruments – Ananthi – New Age International – Rs. 275/-
7. Internet : Additional Reference For All Units .

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER IV

NON MAJOR ELECTIVE COURSE

NMEC II - PAPER III

SATELLITE & CABLE TV

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT-I:

Digital Satellite System - Block Diagram - DTH Working - DTH Antenna - DTH LNB - DTH Receiver - Additional Accessories - Complete DTH Process.

UNIT - II :

Connecting more than one TV Receiver to a Single Dish - Connecting more than one TV to a Single Satellite Receiver - Connecting more than one Dish/LNB to a Single Receiver - Changing Satellite Channels - Need for a Telephone Jack.

UNIT - III :

Dish Installation - Site Survey - Dish Roof and Wall Mounts - Adjusting the Azimuth & Elevation Settings.

UNIT - IV :

Dish Antenna Connection Procedures - Precautions while installing the DTH System - Troubleshooting - Adjusting the Dish in Correct Position - LNB Testing.

UNIT-V:

DD Direct Plus - Satellites Used - Comparison with Other DTH Systems - Reception of DD Direct Plus - Receiver Installation - TV/Radio Channels on DD Direct Plus.

REFERENCE BOOKS :

1. Modern DTH Digital Satellite Receiver - Manahar Lotia - BPB - Rs.120/-
2. Modern Television Practice - Gulati - NAI - III Edition.
3. Composite Satellite & Cable TV – RR Gulati – NAI.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

CORE V - ELECTRONIC COMMUNICATION SYSTEMS

UNLIT I - PROPAGATION OF RADIO WAVES :

Introduction to EM waves – Reflection and refraction of radio waves at the surface of the earth – Ground wave propagation-Sky wave propagation – Space wave propagation – Structure of the Atmosphere – Critical frequency - Skip distance – Maximum Usable frequency (MUF) – Virtual height.

UNIT II - AM GENERATION & TRANSMISSION :

Need for modulation – Amplitude modulation – Frequency Spectrum of the AM Wave - Modulation Index – Power relations in the AM Wave – AM generation – AM Transimitter. - Forms of Amplitude Modulation – Evolution of SSB – Balanced Modulator – Methods of SSB Generation – Vestigial side band Transmission.

UNIT III - FM GENERATION & TRANSMISSION :

Frequency Modulation - Frequency Spectrum of the FM Wave – Modulation Index – Effect of Noise – Adjacent & Co-Channel Interference – Wide Band & Narrow Band FM-FM Generation – Direct and Indirect methods - FM Transmitter – Pre-Emphasis.

UNIT IV - AM & FM RECEPTION :

AM Receiver – TRF Receiver – Super Heterodyne Receiver – Image Frequency Rejection – Frequency Changing & Tracking – Choice of IF – AM Detection – AGC – SSB Detection. FM Receiver – Amplitude Limiter – De-Emphasis – FM Detection – Balanced Slope Detector – Phase Discriminator – Ratio Detector.

UNIT V- PULSE MODULATION :

PAM Modulation & Detection – PWM Modulation & Detection - PPM Modulation & Detection - Sampling Theorem – Quantization & Quantization Error – PCM Modulation & Detection - Companding - ASK – FSK – BPSK – QPSK – DPSK .

REFERENCE BOOKS :

1. Electronic Communication Systems - Kennedy - TMH – IV Ed
2. Electronic Communication Systems - Roddy & Collen – PHI – IV Ed
3. Electronic Communications – Sanjeev Gupta – Khanna Publications .
4. Principles of Communication Engineering – Anokh Singh – S. Chanda

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

CORE VI - IC's AND THEIR APPLICATIONS

UNIT I - IC FABRICATION PROCESS :

Introduction - Basic Planar Process - Fabrication of a Typical Circuit - Active and Passive Components - Fabrication of FET, MOSFET & CMOS .

UNIT II - L OG I C FAM IL Y' s :

Characteristics of IC's - Diode Logic - Transistor Logic - RTL - DCTL - IIL - DTL - HTL - TTL - CMOS - ECL - Comparison of Logic Families.

UNIT III : OP–AMP' S :

Introduction - The ideal OP-AMP - OP-Amp Stages - OP-Amp Parameters - Inverting & Non Inverting Amplifier - Adder - Subtractor - Multiplier - Divider - Integrator - Differentiator - V to I Converter - I to V Converter.

UNIT IV

Filters : Low Pass Filter – High Pass Filter – Band Pass Filter – Band Reject Filter - Solving of Simultaneous Equations – Solving of Differential Equations.

UNIT V – 555 TIMER & 565 PLL :

555 : Functional Diagram - Astable Operation - Monostable Operation - Linear Ramp Generator. PLL : Basic Principle – 565 PLL - Frequency Translation - Frequency Multiplier - Frequency Divider - AM Detection – FM Detection .

REFERENCE BOOKS :

1) Linear IC's – Roy Choudhury – NAI – 4th Edition. (UNIT I)

2) Electronic Circuits – Salivahanan – TMH - II Edition (UNIT II)

3) OP-Amps - Gayakwad - PHI - 4th Edition - (UNIT III, IV & V)

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE I - PAPER I

8051 MICROCONTROLLER AND INTERFACING

UNIT I : 8051 MICROCONTROLLER

Features - Signals - Architecture - RAM Structure - SFR's - Power Saving Modes - Interrupt logic - Timer Logic - Serial Logic.

UNIT II : INSTRUCTION SET

Data transfer - Arithmetic – Logical – Bit manipulation – Branching Instructions – Stack & Stack Operations – Addressing Modes- Simple Programs.

UNIT III : INTERFACING

Interfacing With : Switches & Matrix Keyboard - LED'S - Single & Multiple Seven Segment Displays – LCD.

UNIT IV :

Interfacing With : ADC 0809 IC – DAC 0800 IC - Stepper Motor – DC Motor – Traffic Light Control System.

UNIT V : MEMORIES

ROM – PROM – EPROM(2764) - EEPROM – NVRAM - Static RWM (6264) - Dynamic RWM (TC511000) - RWM Refreshing – Pseudostatic RWM.

REFERENCE BOOKS :

1. The 8051 Microcontroller Embedded Systems – Mazidi & Mazidi - Pearson - 2nd Edition.

2. Introduction to Microprocessor -AP Mathur - TMH – 3rd Edition (Unit- V)

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE I - PAPER II

PIC16F877 MICROCONTROLLER AND INTERFACING

UNIT I : PIC16F877 MICROCONTROLLER

Features – Signals - Architecture – Memory Organization – Watch Dog Timer – Reset Types – Oscillator Types – Power Down Modes – I/O Ports – CCP Module – SSP Module. (USART, SPI, I2C & ICSP)

UNIT II : INSTRUCTION SET

Byte Oriented – Bit Oriented - Literal & Control Instructions – Stack & Stack Operations - Addressing Modes – Simple Programs - Timer logic – interrupt logic – Serial Logic – ADC.

UNIT III : INTERFACING

Interfacing With : Switches & Matrix Keyboard - LED'S - Single & Multiple Seven Segment Displays – LCD.

UNIT IV :

Interfacing With : ADC 0809 IC – DAC 0800 IC - Stepper Motor – DC Motor – Traffic Light Control System.

UNIT V - MEMORIES

ROM – PROM – EPROM(2764) - EEPROM – NVRAM - Static RWM (6264)

- Dynamic RWM (TC511000) - RWM Refreshing – Pseudostatic RWM.

REFERENCE BOOKS :

1. PIC16F877 Data Book – MICROCHIP .
2. Fundamentals of Microcontrollers and Applications In Embedded Systems (With the PIC18 Microcontroller Family) – Ramesh S Gaonkar – PRI – RS.300/-
3. Design With Pic Microcontrollers – John B.peatman – Pearson
4. Introduction to Microprocessors – AP Mathur – TMH – 3rd Edition (UNIT - V).

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE I - PAPER III

PROGRAMMABLE LOGIC CONTROLLERS

UNIT I : PLC BASICS

Advantages and Disadvantages – Overall PLC System – Input & Output Modules – Printing PLC Information – CPU – Memory – Processor – I/O Modules – Power Supplies – Programming Equipment – Programming Formats – Construction of PLC Ladder Diagram – Processors Scanning Considerations – PLC Operational Faults – Input ON/OFF Switching Devices – Input Analog Devices – Output ON/OFF Devices – Output Analog Devices.

UNIT II : PLC PROGRAMMING

Input Instructions – Outputs: Coils, Indicators & Others – Operational Procedures – Contact and Coil I/O Programming Examples (Any 3) – Digital Logic Gates – Boolean Algebra PLC Programming – Conversion Examples (Any 3) – Ladder Diagrams and Sequence Listings – Large Process Diagram Construction.

UNIT III : PLC FUNCTIONS

General Characteristics of Registers – Module Addressing – Holding Registers – Input Registers : Single and Group – Output Registers : Single and Group – PLC Timer Functions – Examples of Timer Function Industrial Applications (Any 3) – PLC Counters – Examples of Counter Function Industrial Applications (Any 3).

UNIT IV : INTERMEDIATE FUNCTIONS

PLC Addition and Subtraction – PLC Repetitive Clock – PLC Multiplication, Division, Square Root, Trignometric and Log Functions – Other Arithmetic Functions – Basic Comparison Functions – Basic Comparison Function Applications (Any 3).

UNIT V : DATA HANDLING FUNCTIONS

Skip Function and Applications – MASTER CONTROL RELAY Function and Applications – Jump with Non Return – Jump with Return – MOVE Function & Applications – Moving Large Blocks of PLC Data – PLC Table and Register Moves – PLC FIFO Function – FAL – ONS – CLR And SWEEP Functions – Bit Patterns in a Register – Changing a Register Bit Status – Shift Register Functions and Applications. PLC Networking.

TEXT BOOK

Programmable Logic Controllers – John W. Webb & Ronald A. Reis – PHI – V Edition – Rs.295/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE II - PAPER I

MODERN TELEVISION SYSTEMS

UNIT I - TELEVISION STANDARDS :

Aspect Ratio - Scanning – Number of Scanning Lines - Interlaced Scanning - Vertical Resolution and Horizontal Resolution – Horizontal & Vertical Sync Details - Composite Video Signal - Channel Bandwidth – Vestigial Side Band Transmission & Reception – Complete Channel Bandwidth – FM Channel Bandwidth – Allocation of Frequency Bands For TV Transmission - Positive and Negative Modulation – CCIR–B Standards

UNIT II - RECEIVER CIRCUITS :

RF Tuner –Tuner Types - Various Sections of a VHF Tuner – UHF Tuner – Electronic Tuning – Video IF Section – IF Amplifier – VSB Correction - Video IF Amp using IC CA 3068 - Video Detector Operation & Requirements – Video Amplifier Operation & Requirements – Coupling Methods – Video Amp Using IC TBA 890

UNIT III - SYNC SEPERATOR :

Block Diagram – Vertical & Horizontal Sync Separation - Vertical O/P Stage & Requirements – Vertical O/P Stage IC's – EHT generation - S Correction – Line O/P Stage Using Transistors & IC CA 920 – AGC – Types of AGC - Sound Section – Sound Take Off Circuit – Inter Carrier Sound IF Amp – AM Limiting – FM Detection – Any One FM Detector - Sound Section IC CA 3065

UNIT IV - COLOUR TELEVISION :

Compatibility – Natural light – Colour perception – Three colour theory – Chromaticity diagram – Luminance, Hue and Saturation – Luminance & Colour difference signals - Frequency interleaving – Bandwidth for Colour Signal Transmission - Modulation of Colour Difference Signals - Colour TV Standards

UNIT V - TELEVISION TRANSMISSION & RECEPTION :

Monochrome TV Camera Tubes (Any One) – Monochrome Picture Tube - Block diagram of Monochrome TV Transmitter and Receiver – Colour TV Camera – Colour Picture Tubes (Any One) – PAL-D Coder – PAL Decoder – Merits & Demerits - Low Voltage Power Supply – High Voltage Power Supply – SMPS - Merits & Demerits

REFERENCE BOOKS :

1. Monochrome And Colour Television - Gulathi – Nai – Ii Edition
2. Colour Television Principles And Practice - Gulathi - Nai
3. Modern Television Practice - Gulathi - Nai - III Edition

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE II - PAPER II

RADAR AND NAVIGATIONAL SYSTEMS

UNIT I - INTRODUCTION TO RADAR :

Basic Radar –The simple form of the Radar Equation - Radar Block Diagram - Radar Frequencies – Applications of Radar – The Radar Equation -Transmitter Power - Pulse Repetition Frequency - Antenna Parameters - Other Radar Equation Considerations

UNIT II - MTI AND PULSE DOPPLER RADAR :

Doppler and MTI Radar- Moving Target Detector - MTI from a Moving Platform - Pulse Doppler Radar – Other Doppler Radar Topics - Tracking with Radar – Automatic Tracking with Surveillance Radars.

.UNIT III - RADAR TRANSMITTER AND RECEIVER :

Linear Beam Power Tubes - Solid State RF Power Sources - Magnetron - Crossed Field Amplifiers - Other RF Power Sources - Other aspects of Radar Transmitter - The Radar Receiver - Superheterodyne Receiver - Duplexers and Receiver Protectors- Radar Displays.- Propagation Radar Waves - Atmospheric Refraction –Standard propagation - Nonstandard Propagation - The Radar Antenna - Reflector Antennas .

UNIT IV - RADIO DIRECTION FINDING & RANGES :

An Aural Null Direction Finder – The Goniometer - Automatic Direction Finders - The Commutated Aerial Direction Finder - The LF/MF Four course Radio Range - VHF Omni Directional Range - VOR Receiving Equipment - Loran-A Equipment - The Decca Navigation System - Decca Receivers - The Omega System.

UNIT V - METHODS OF NAVIGATION :

Operation of DME - TACAN Equipment. - Instrument Landing System - Ground Controlled Approach System – Microwave Landing System - Navigation Over the Earth - Components of an Inertial Navigation System.

REFERENCE BOOKS :

1. Introduction To Radar Systems - Skolnik – Tmh – Iii Edition 2003
2. Radar Principles - Peyton Z Peebles - John Wiley – 2004
3. Principles Of Radar - Jc Toomay - Phi Ii Edition - 2004
4. Microwave & Radar Engineering – Kulkarni – Umesh Publications
5. Radar System & Radar Aids To Navigation – Sen & Battachariya – Khanna Publications.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE II - PAPER III

SATELLITE , CABLE AND DTH SYSTEMS

UNIT I : SATELLITE SYSTEMS : Geo- Stationary Satellite – Satellite Communication System – Satellite Electronics – International and Regional Direct Broadcasting Satellites – Indian Domestic Satellites – Domestic Broadcasting Systems.

UNIT II : CABLE TV SYSTEMS : Cable Signal Sources – Cable Signal Processing – Cable Signal Distribution – Bidirectional Networks – Scrambling of TV Signals – Cable Signal Convertors.

UNIT III : DIGITAL SATELLITE TV: Digital Satellite Transmission – Digital Satellite Reception and Decoding – DTH TV – Digital TV Receiver – Merits of Digital TV Receiver – DTT.

UNIT IV : DTH WORKING : DTH Antenna – DTH LNB – DTH Receiver

– Additional Accessories – Complete DTH Process – Connecting more than One TV Receiver to a Single Dish , Connecting more than one TV to a Single Satellite Receiver – Connecting more than one Dish/LNB to a Single Receiver – Changing Satellite Channels – Need of Telephone Jack.

UNIT V : DISH INSTALLATION – Site Survey – Dish Roof and Wall mounts – Adjusting the Azimuth and Elevation Settings – Dish Antenna Connection Procedures – Precautions - Trouble Shooting – Adjustment to Correct Position – LNB Testing – DD Direct Plus – Satellites Used – Comparison with Other DTH Systems – Reception of DD Direct Plus – Receiver Installation – TV/Radio Channels on DD Direct Plus.

REFERENCE BOOKS :

1. Modern TV Practice – R.R. Gulati – NAI – IIIrd Edition
2. Modern DTH Digital Satellite Receiver – Manahor Lotia – BPB – Rs.120/-
3. Composite Satellite and Cable TV – R.R. Gulati – NAI.
4. Satellite Communication - Dennis Roddy – TMH

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE II - PAPER IV

MOBILE COMMUNICATON & SERVICING

UNIT I : MOBILE DATA COMMUNICATION

Introduction – Cellular Radio – Elements of a Cellular Network – Cellular Telephony – Radio Propagation – Speech Coding – Error Coding and Error Corrrection.

UNIT II :

Mobility Management - Hand Off Management – Hard Hand Off – Soft Hand Off – Switching and Authentication – MTSO Interconnections- Circuit Switched and Packet Switched Data Services on Cellular Networks.

UNIT III : MULTIPLE ACCESS TECHNOLOGIES

Introduction - Frequency division multiple access - Time division multiple access - Code Division Multiple Access – Spread Spectrum Techniques.

UNIT IV : MOBILE SERVICING

Hardware/Software Repairing - Various Locks - Installation of : UFS Driver, UFS Suite & Flashing Files - IMEI Number Detection – Mobile Utility Codes.

Unit V : OTHER MOBILE SERVICE TOOLS

Ultrasonic Cleaner - Computer Connectors - SIM Card Reader - Memory Card Reader - Mobile Virus - Virus Prevention - Removing Virus - Health Hazards with Mobiles - SAR.

REFERENCE BOOKS

1. Wireless Communications And Networking – Made Simple – Satish Jain – BPB Publications. Rs. 135/-(Units : I , II & III)
2. Modern Mobile Phone Repair using Computer Software & Service Devices - Manahar Lotia - BPB - 120/- (Units IV & V)
3. Modern Mobile Phone Unlocking & Utility Codes For GSM & CDMA Phones - Manahar Lotia - BPB - Rs.99/- (Unit IV)
4. Mobile Cellular Telecommunication – II Edition - William CY Lee – TMH
5. Mobile Communications – Schiller – Pearson – II Edition.
6. Wireless Communications – Stalling – Pearson II Edition.
7. Mobile & Personal Communication Systems & Services - Raj Pandya - PHI – Rs.250/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

SKILLED BASED ELECTIVE COURSE

SBEC III - ELECTRONIC INSTRUMENTATION

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT I - ELECTRO MECHANICAL INDICATING INSTRUMENTS :

DC Ammeter - DC Voltmeter - Voltmeter Sensitivity - AC Voltmeter - Considerations in Analog Voltmeter - Series & Shunt Type Ohmmeter - Calibration of DC Instruments – Study of a Typical Digital Multimeter.

UNIT II - BRIDGES :

Wheatstone Bridge - Balance Equation of General AC Bridges – Capacitance & Inductance Comparison Bridge - Maxwell – Hay - Schering - Wien - Kelvin & Kelvin's Double Bridge .

UNIT III : OSCILLOSCOPE :

Block diagram - CRT - Vertical Deflection System - Delay line - Horizontal Deflection System - CRT screens & Graticules - Oscilloscope Probes - Measurement of Frequency, Amplitude & Phase - Lissajou's Patterns.

UNIT IV - SIGNAL GENERATION & SIGNAL ANALYSIS :

Sample & Hold Circuit - Instrumentation Amplifier - Function Generator - Pulse Generator - Q Meter - Vector Impedance Meter - Wave Analyzer - Harmonic Distortion Analyzer .

UNIT V - TRANSDUCERS :

Resistive Transducers – Inductive Transducers - Capacitive Transducers - Piezo Electric Transducer - Thermo Electric Transducers – Temperature Transducers – Microphones & Loud Speakers.

REFERENCE BOOKS :

1. Electronic Instrumentation - H.S. Kalsi - TMH.
2. Modern Electronic Instrumentation & Measurement Techniques - Cooper - PHI.
3. Electronic Measurements & Instrumentation – Salivahanan – S.Chand - Rs.270/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

SKILLED BASED ELECTIVE COURSE

SBEC IV - COMPETETIVE SKILLS

(SIMPLE THEORY ONLY)

50 Multiple Choice Questions. EACH QUESTION 1.5 MARKS.

TEN Multiple Choice Questions From Each Unit

Unit I : VERBAL REASONING

Analogy – Classification – Direction Sense Test – Logical Sequence of Words – Inserting The Missing Character – Situation Reaction Test.

Unit II : NON VERBAL REASONING

Analytical Reasoning – Mirror Images – Water Images - Completion of Incomplete Pattern – Cubes and Dice.

Unit III : ARITHMETICAL ABILITY

Average – Problems on Age – Percentage – Profit & Loss – Ratio & Proportion – Chain Rule – Time & Work.

Unit IV :

Pipes & Cistern – Time & Distance – Problems on Trains - Boats & Streams – Simple Interest – Compound Interest – Logarithms.

Unit V :

Area – Calendar – Clocks – Heights & Distances – Bar Graphs – Pie Charts.

Reference Books

1. A Modern Approach To Verbal & Non Verbal Reasoning - Revised Edition – R.S. Aggarwal – S. Chand. (Units : I & II) – Rs.750/-
2. Quantitative Aptitude - Revised Edition - R.S. Aggarwal – S. Chand. Units : III , IV & V) – Rs.440/-
3. An Advanced Approach To Data Interpretation - R.S. Aggarwal – S. Chand.
4. Advanced Objective General Knowledge - R.S. Aggarwal – S. Chand
5. Objective General English - R.S. Aggarwal – S. Chand

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

CORE VII - PC HARDWARE NETWORKING & TROUBLESHOOTING

UNIT-I:

MOTHERBOARD : Components - Support Circuits – Connectors - Installation - Troubleshooting – BIOS Beep Codes - Study of a Latest Motherboard - Form Factor - PC Assembly - Cabinet Form Factor .

UNIT - II :

Memory Modules - Cache Memory - Shadow Memory - Common Memory Errors - Battery - BIOS Functions – BIOS Setup – BIOS Upgrade.

UNIT - III :

KEYBOARD : Organisation - Troubleshooting - Ergonomics –

MOUSE : Connection - Resolution - Installation - Troubleshooting.

UNIT - IV :

HARD DISK : Form Factor - Storage Capacity - Disk Geometry - Interfacing – Installation , Formatting & Troubleshooting .

PRINTER : Types , Interface & Troubleshooting.

UNIT-V:

NETWORKING : Setting up a Network – Preparation for Network Installation – Network Configuration – Sharing Computer – Sharing Printer – Troubleshooting Networking.

VIRUS : Types - Working - Symptoms - Antivirus.

REFERENCE BOOKS :

1. Modern Computer Hardware Course - Manohar Lotia - BPB - Rs.360/-
2. Ibm Pc And Clones – Govindarajulu – Tmh
3. Ibm Pc Advanced Trouble Shooting And Repairing Guide – Robert .c.brenner - Phi.
4. Trouble Shooting, Maintenance & Repairing Pc's–stephen J.bigelow- Tmh – Ii Ed
5. Upgrading and Repairing PC's - Scott Mueller – Pearson - 18th - Edition.
6. DOS 6 & 6.22 An Introduction - Manohar Lotia – BPB – Rs.99/-
7. DOS 6 & 6.22 Companion - Satish Jain - BPB – RS.210/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

CORE VIII - NETWORK COMMUNICATION & SECURITY

UNIT I – TRANSMISSION METHODS

Digital Signal Analog Transmission – Baud Rate - Analog Signal Digital Transmission – Parallel & Serial Communication – Asynchronous & Synchronous Communication – Simplex – Half Duplex - Full Duplex – Multiplexing - Demultiplexing - Types of Multiplexing.

UNIT II - NETWORK TOPOLOGIES

Mesh Topology – Star Topology – Tree Topology – Ring – Bus – Hybrid – Basics of Switching – Router & Routing – Internet Topology – Architecture of an ISP – Logical Types of Topology.

UNIT - III : NETWORK PROTOCOLS

OSI Model – Physical Layer – Data Link Layer – Network Layer – Transport Layer – Session Layer – Presentation Layer – Application Layer – Overview of Network Protocols.

UNIT – IV : LAN TECHNOLOGIES

Introduction – LAN Hardware – Implementing LAN – Fast LANS - Nonstandard LANS – Extending LANS – Virtual LANS – Token Passing Networks – FDDI – MAN – WAN.

UNIT - V : INTERNET ACCESS & NETWORK SECURITY

Introduction – Dial up Access – Leased lines – DSL - Cable Modems – DTE – DCE Interface – RS-232 & RS-449 Interface – SONET.

NETWORK SECURITY : Introduction – Types of Computer Attacks – Firewall – Virtual Private Network-Cryptography.

REFERENCE BOOKS :

1. Data Communication & Networks - Achyut .S. Godbole & Atul Kahate – TMH – 2ED (Units : I , II , III & V)
2. Advanced Computer Networking (Concepts and Applications) - Satish Jain – BPB – Rs. 195/- (Unit : IV & V)
3. Data Communication And Networking (UPDATED EDITION) – Satish Jain – BPB Publications. Rs.270/-
4. Computer Networks – UYLESS BLACK – PHI - IIND EDITION .
5. Computer Networks – ANDREW. S. TANENBAUM – PHI.
6. Communication Protocol Engineering - Pallapa Venkataram and S.S.Manvi - PHI.
7. Networking Concepts And Netware – Anand – Himalaya Publications

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

CORE IX - BIOMEDICAL INSTRUMENTS

(Simple Theory Only) OR PROJECT WORK

UNIT I :

Introduction to Human Physiology – Micro Electrodes – Skin Surface Electrodes – Needle Electrodes – Reference Electrodes - Digital Thermometer – Sphygmo Manometer - Electronic Sthethoscope

UNIT II - RECORDERS AND METERS :

ECG - EEG - EMG - – Cardio Tocography - Electro Oculography - Electro Retinography - Poly Somnography - Spirometer - Blood Flow Meter - Doppler - Audiometer

UNIT III - TS :

- Upper Endoscope - Lower Endoscope - ENT Endoscope - - Diathermy - Surgical Diathermy- Micro Wave Diathermy - Multipara Patient Monitor.

UNIT IV - INTENSIVE CARETS :

Pulse Oximeter - Block Diagram & Sensor – Ventilator – Cardiac Monitor - ECG Holder - Defibrillator - Pace maker : Implantable and External Pacemakers - Infant Warmer - Infant Incubator - Baby Phototherapy – Nebulizer.

UNIT V - MODERN IMAGING SYSTEMS :

Ultra Sound Scanner - Color Doppler - X-Ray Machine – C-Arm - CT Scan – MRI Scan – Angiography - LASER in Medical Applications.

ELECTRICAL SAFETY OF MEDICAL INSTRUMENTS :

Radiation Safety - Physiological Effects Due to 50 Hertz Current Passage - Micro Shock - Macro Shock - Electrical Accidents in Hospitals - Devices to Protect Against Electrical Hazards – SMPS in Medical Equipments.

REFERENCE BOOKS :

1. Biomedical Instrumentation & Measurements – Ananda Natarajan – PHI RS.275/-
2. Biomedical Instrumentation And Measurements - Leslie Cromwell - PHI - 2nd Edition.
3. Bio-Medical Instrumention - Dr.M.Arumugam - Anuradha Agencies - 2nd Edition
4. Handbook Of Biomedical Instrumentation - R.S.Khandpur – TMH .
5. Medical Instrumention, Application And Design – John G.Webster - WEL - 3rd Edition
6. A Text Of Book Of Medical Instruments – Ananthi – New Age Internationa Rs.275/-
7. Internet : Additional Reference for all Units.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

ELECTIVE III - PAPER I

PCB DESIGN AND FABRICATION

UNIT I : QUICK START & COMPONENTS :

PCB Introduction – Surface Mount and Through hole – Prototyping – Installing EAGLE Light Edition on Windows - Light Edition Limitations – Creating New Project – Drawing the Schematic – Electrical Rule Check – Laying out the Board – U.S. Versus European Circuit Symbols – Resistors – Capacitors – Transistors & Diodes – IC'S– Connectors – Other Components – Buying Components – Paper PCB.

UNIT II : EDITING SCHEMATICS :

The Anatomy of the Schematic Editor – The Command Toolbar – Nets – Buses – Worked Examples.

PCB LAYOUT :

Experimenting – Layers – The Command Toolbar - The Grid – Sound Meter Layout (Through Hole) – Sound Meter Layout (Surface Mount) – Manual Layout.

UNIT III : PCB FABRICATION :

Gerber Files – Loading a CAM Job – Running a CAM Job – Measure Twice, Cut Once – Submitting a job to a PCB Service – Instructions – Photoetching – Milling PCBs – Toner Transfer.

PCB SOLDERING :

General Tools - Tools for Surface Mount Devices – Soldering Through Hole PCB's – SMD Hand Soldering – SMT with Hot Air Gun – Using a Reflow Oven.

UNIT IV :

Commands - Scripts – User Language Programs – Creating Library – Copying a Device from Another Library – The Part Editor – Devices , Symbols , and Packages – Editing a Part – Creating New Part.

UNIT V : ENVIRONMENTAL CONCERNS :

Pollution Control in PCB Industry – Pollutiong Agents – Recycling of Water – Recovery Techniques – Air Pollution – Recycling of PCB's – Environmental Standards – Safety Precautions – Toxic Chemicals.

REFERENCE BOOKS :

1. Make Your Own PCB's With EAGLE – Simon Monk – Mcgraw Hill (2014)
2. EAGLE MANUAL – Version V – Seventh Edition.
3. PCB Design Fabrication, Assembly and Testing – Dr. R.S. Khandpur – TMH.
4. PCB Design & Fabrication – Walter.C.Bosshart – TMH

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

ELECTIVE III - PAPER II

PROGRAMMING USING VERILOG HDL (SIMPLE CONCEPTS ONLY)

Unit – I : Basic Verilog Topics :

Overview – Design Flow – Hierarchical Modeling Concepts – Design Methodologies –Modules – Instances – Components of Simulation.

Unit – II : Basic Concepts :

Lexical Conventions – White Space – Comments – Operators – Number Specification – Strings – Identifier and Keywords – Data Types–Nets–Registers – Vectors Arrays – Memories – Parameters– Strings–System Tasks and Compiler Directives.

Unit – III : Modules and Ports :

Modules – Ports – Port Declaration – Port Connection Rules – Connecting Ports to External Signals – Gate Level Modeling – Gate Types.

Unit – IV : Data Flow Modeling :

Continuous Assignment – Delays – Expression – Operators and Operands – Operator Types – Behavior Modeling - Structure Procedures – Procedural Assignments – Timing Controls.

Unit – V : Behavioral Modeling :

Conditional statements – Multiway Branching – Loops – Sequential and Parallel Blocks – Generate Blocks – Logic Synthesis with Verilog HDL - Impact of Logic Synthesis – Verilog HDL Synthesis – Synthesis Design Flow.

Text Book :

1. Verilog HDL – A Guide to Digital Design and Synthesis – Samir Palnitkar – Pearson - II EDITION.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

ELECTIVE III - PAPER III

ELECTRONIC DEFENSE SYSTEMS

(SIMPLE THEORY ONLY)

Unit I : Electronic Defense

Introduction – Systems in Use in the Armed Forces – The Main Weapon Systems – Objectives & Organization of Electronic Defense – Operational Objectives - Information Operation & Warfare – Need for the Study of Weapon Systems.

Unit II : Weapon Systems

Artillery Systems – Missile Systems (Any 3) – Passive Antiradiation Missiles – Stealth Aircraft – Communication Systems – Information Operations.

Unit III : Electronic Intercept Systems

Introduction – Radar Warning Receivers – Electronic Support Measures – Omnidirectional Antennas – Antennas for Direction Finding – Digital Receivers – Electronic Intelligent Systems – Advanced Passive Location Techniques – Infrared Intercept Systems – Communications ESM & Communication Intelligence.

Unit IV : Electronic Countermeasure Systems

Introduction – Off Board Passive & Active ECM Systems – On Board Passive & Active ECM Systems – ECM Techniques (Any 3) – Infrared Countermeasures – Communications Countermeasures – Information Warfare.

Unit V : Electronic Counter-Countermeasure Systems

Introduction – Tracking Radar Counter-Countermeasures – Infared Counter-Countermeasures – Communications Counter – Countermeasures – New Electronic Defense Architectures.

Text Book :

1. Introduction To Electronic Defense Systems – Filippo Neri – New Age International – Second Edition - Rs.395/-

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

ELECTIVE III - PAPER IV

NANO ELECTRONICS

(SIMPLE THEORY ONLY)

UNIT I - INTRODUCTION & ETHICAL ISSUES :

What is Nanotechnology - Advantages - Scope - Limits of Nanotechnology - Solutions cause Problems - Change causes Problems - Clean, Decentralized Production causes Problems - Even Wealth & Leisure cause Problems - Changing Employment causes Problems - Frequently Asked Questions.

UNIT II - SELF ASSEMBLY :

Bottom - Up Self Assembly - Top Bottom Assembly - Other Production Processes - MEMS Process - Deposition Processes - Lithography - Etching Processes.

UNIT III - INSTRUMENTATION TECHNIQUES :

AFM - SEM - TEM - Auger Electron Spectroscopy - LASER Induced Breakdown Spectroscopy.

UNIT IV - NANO ELECTRONICS & CARBON NANO TUBES :

Triple Gate MOSFET & EJ-FET Properties - Carbon Nanotubes - Fabrication Methods - CNT Based Biosensors and Advantages - Properties of CNT - Fuel cells & Nanotech.

UNIT V : NANO - BIO :

Nanotechnology in Medicine - Working Outside TISSUES - Working Within Tissues. Applications : Killing Cancer Cells - Providing Oxygen - Artificial Mitochondria.

REFERENCE BOOKS :

1. Nano Technology - A Future Technology With Visions - Appin LABS - BPB – Rs.270/-

2. Nano : The Essentials “Understanding Nano Science & Nano Technology “ - T Pradeep – TMH

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

SKILLED BASED ELECTIVE COURSE

SBEC V - AUDIO & VIDEO SYSTEMS (SIMPLE THEORY ONLY)

UNIT I : MICROPHONES :

Characteristics and Requisites - Types (Any 3) – Comparison - Special Microphones – Precautions . **Loudspeakers** : Characteristics – Types (Any 2) – Comparison – Line Source Speakers – Woofers & Tweeters – Crossover Networks .

UNIT II : AUDIO AMPLIFIERS :

Types - Characteristics – Amplifier Circuits – PMPO - **Public Address Systems** : Need and Use – Block Diagram - Requirements of a PA System - Installation Planning for Various Occasions (Any 3).

UNIT III : STEREOPHONY :

Meaning – Stereophony in Human System of Hearing – Differences between Stereophony and Monophony – Ideal Stereo System – Practical Stereo System – Quadraphonic and Surround Sound Systems – Stereo Recording on Tape and Reproduction – Hi-fi Stereo Reproducing System Stereo Controls.

UNIT IV : TROUBLESHOOTING IN AUDIO SYSTEMS : Maintenance Policy - Maintenance Aids for Fault Diagnosis – Servicing and Maintenance Procedure – Shielding and Grounding - Fault Location – Faulty Component Identification – Common Faults – Intermittent Faults - Troubleshooting : Power supply – Public Address System .

UNIT V : COLOUR TV RECEIVER ALIGNMENT AND SERVICING :

TV Test Charts – Colour TV Receiver Alignment & Servicing – Modern Colour TV Receivers – Preliminary Trouble Shooting – Safety Precautions.

REFERENCE BOOKS :

1. Audio & Video Systems – R G Gupta - TMH – II Edition.
2. Modern Television Practice – R R Gulati - NAI – III Edition

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

SKILLED BASED ELECTIVE COURSE

SBEC VI - LIFE DEVELOPMENT SKILLS

Unit I – SELF ANALYSIS

Self Analysis and Self Concept – Understanding Self : Attitude, Aptitude and Self Esteem – Assertiveness – Confidence Building – Motivation : Concept , Theories and Importance.

Unit II – SELF DEVELOPMENT

Introduction – Goal Setting : Concept, Setting Smart Goals – Emotion : Concept, Types, Emotioinal Intelligence – Creativity : Concept and Factors Enhancing Creativity – Stress Management – Health Management : Importance, Dietary Guidelines and Exercises – Time Management : Importance and process.

Unit III : LOOKING FOR A JOB

Identifying Different Sources Announcing Job Vacancies – Skimming, Scanning and Reading Advertisements in Detail – Writing Effective CVs – Covering Letters that Accompany CVs - Techniques of Writing Job Application Letters / Covering Letters – Preparing for a Job Interview.

Unit IV : NON – VERBAL SKILLS

Graphic Communication – Non Verbal Communication – Aspects of body Language – Formal Written Communication – Memos (Memoranda) – E-mails – Netiquette – Business Correspondents.

Unit V : TELEPHONE SKILLS

Understanding Telephone Communication – Types of calls – Handling Calls – Leaving a Message – Making Requests – Asking for and Giving Information – Giving Instructions – Agreeing and Disagreeing – Making or Changing Appointments – Reminding – Making Complaints and Handling Complaints – Telephone Etiquette.

REFERENCE BOOKS :

1. Development Of Life Skills And Professional Practice– Shalini Verma – Vikas Publishing House Pvt Ltd., Rs. 200/- (Units : I & II)
2. Development Of Life Skills – II – Shalini Verma – Vikas Publishing House Pvt Ltd., Rs. 225/- (Units : III &IV)
3. A Course In Communication Skills - P. Kiranmai Dutt – Cambridge University Press India Pvt. Ltd., Foundation Books, Cambridge House, 4381/4, Ansari Road, Daryaganj, New Delhi -110 002. (Unit : V)

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V & VI

CORE PRACTICAL IV

IC'S & COMMUNICATION LAB

(ANY HARDWARE BASED SIMULATION TOOL MAY ALSO BE USED)

(Any 22 Experiments)

1. NAND GATE Implementation Using TTL.
2. NOT/NAND/NOR GATE Implementation Using IIL / CMOS. OR /
3. NOR GATE Implementation Using ECL.
4. Inverting / Non-Inverting Ampplifier Using Op-Amp
5. Inverting / Non-Inverting Adder Using Op-Amp.
6. Subtractor Using Op-Amp.
7. Multiplier / Divider Using Op-Amp.
8. Differentiator / Integrator Using Op-Amp.
9. Low Pass / High Pass Filter Using Op-Amp.
10. Band Pass / Band Reject Filter Using Op-Amp.
11. Voltage to Current Converter (Grounded load).
12. Current to Voltage Converter.
13. Solving of Simultaneous Equations Using Op-Amp.
14. Square Wave Generation Using Op-Amp
15. Triangular Wave Generation Using Op-Amp
16. Phase Shift Oscillator Using Op-Amp.
17. Wein Bridge Oscillator Using Op-Amp.
18. Amplitude Modulation & Demodulation.
19. Pulse Amplitude Modulation & Demodulation.

20. Pulse Width Modulation & Demodulation.
21. Astable Multivibrator Using 555 IC
22. Monostable Multivibrator Using 555 IC Triangular
23. Waveform Generation Using 555 IC
24. Voltage Controlled Oscillator Using 555 IC Schmitt
25. Trigger Using 555 IC
26. Frequency Multiplication Using 565 IC
27. Binary Weighted Resistor Type of DAC
28. R - 2R Ladder Type of DAC.
29. ADC Using ADC 0809
30. DAC Using DAC 0800

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V & VI

CORE PRACTICAL V

8051 MICROCONTROLLER & INTERFACING LAB

(ANY EMBEDDED BASED SIMULATION TOOL MAY ALSO BE USED

(Any 17 Experiments)

1. Addition of Two ; 8 Bit Numbers.
2. Subtraction of Two ; 8 Bit Numbers
3. Multiplication of Two ; 8 Bit Numbers
4. Division of Two ; 8 Bit Numbers
5. BCD Addition
6. BCD Subtraction
7. FILL
8. BLOCK MOVE
9. 1's & 2's Complement of a 16 Bit Number.
10. Smallest / Largest of ; N Numbers.
11. Ascending / Descending Order of ; N Numbers.
12. Sum of N ; 8 Bit Numbers.
13. Multi Byte Addition.
14. 3 Digit Decimal to Two digit Hexadecimal Conversion.
15. Two Digit Hexadecimal to 3 digit Decimal Conversion.
16. ADC Interface.
17. DAC Interface.
18. Waveform Generation Using DAC.
19. Stepper Motor Interface.

20. Interface With Switches
21. Hex Keyboard Interface.
22. Interface With LED's.
23. Interface With Single Seven Segment Display.
24. Interfacing With Multiple Seven Segment Displays.
25. Interface With LCD's.
26. Interfacing With Solid State Relay.
27. Moving Display.
28. Blinking Display.
29. Digital Clock.
30. Traffic Light Control.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V & VI

CORE PRACTICAL V

16F877 MICROCONTROLLER & INTERFACING LAB

(ANY EMBEDDED BASED SIMULATION TOOL MAY ALSO BE USED

(Any 17 Experiments)

1. Addition of Two ; 8 Bit Numbers.
2. Subtraction of Two ; 8 Bit Numbers
3. Multiplication of Two ; 8 Bit Numbers
4. Division of Two ; 8 Bit Numbers
5. BCD Addition
6. BCD Subtraction
7. FILL
8. BLOCK MOVE
9. 1's & 2's Complement of a 16 Bit Number.
10. Smallest / Largest of ; N Numbers.
11. Ascending / Descending Order of ; N Numbers.
12. Sum of N ; 8 Bit Numbers.
13. Multi Byte Addition.
14. 3 Digit Decimal to Two digit Hexadecimal Conversion.
15. Two Digit Hexadecimal to 3 digit Decimal Conversion.
16. ADC Interface.
17. DAC Interface.
18. Waveform Generation Using DAC.
19. Stepper Motor Interface.

20. Interface With Switches
21. Hex Keyboard Interface.
22. Interface With LED's.
23. Interface With Single Seven Segment Display.
24. Interfacing With Multiple Seven Segment Displays.
25. Interface With LCD's.
26. Interfacing With Solid State Relay.
27. Moving Display.
28. Blinking Display.
29. Digital Clock.
30. Traffic Light Control.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V & VI

CORE PRACTICAL V

PLC PROGRAMMING LAB

(ANY EMBEDDED BASED SIMULATION TOOL MAY ALSO BE USED

(Any 17 Experiments)

1. Study of PLC Symbols
2. Study of Various Logic Execution in Ladder Diagram.
3. Writing of Ladder Logic for Different Statements.
4. Ladder Diagram Development for Different Types of Logic Gates using Suitable Software
5. PLC Input - Output Wiring Methods
6. Operating Simple Loads using Relays , Switches and Pushbuttons
7. Different Applications of Push Buttons
8. Programming the PLC Via Ladder logic
9. Working of Different Types of Timers
10. Study & Implement ; ON delay timer in PLC
11. Study & implement ; OFF delay timer in PLC
12. Working Of Different Types of Counters
13. Study & Implementation of Up Counter in PLC Programming.
14. Study & Implementation of Down Counter in PLC Programming.
15. Interlocking
16. Sequencer
17. Sequential Operation of On/Off of A Set of Lights
18. Forward And Reverse Direction Control of Motors

19. Latching and Unlatching of motor
20. Prepare the Physical and Programmed Ladder Diagram for the Control Problem shown below & Implement the same.
21. PLC Programming for Bottle Filling Plant.
22. Procedure for Producing a Ladder Logic Diagram for Car Parking Simulation
23. Position Control for Satellite Dish DC Motors
24. Starting Three Phase Induction Motors Via Star-Delta Starter
25. Automatic Indication of Water Tank Level
26. Traffic Lights Indication

B.SC. ELECTRONICS AND COMMUNICATION

CIRCUIT IMPLEMENTATION USING ARDUINO UNO BOARDS COMMON FOR ALL PRACTICALS UNDER GROUP D

ANY FIVE

1. LED Control Through Push Buttons
2. Photo Resistor as Light Intensity Detector
3. DC Motor Direction Control using L293D
4. DC Motor Speed Control using L293D
5. Displaying Text on LCD Display
6. Scrolling Text on LCD Display
7. Interfacing 4 x 3 Keypad and LCD
8. Displaying Alphanumeric Characters on Dot Matrix Display
9. Display of Numeric Characters using 7 Segment Display.
10. Unipolar Stepper Motor Speed Control Using ULN2003A
11. LED Control Through Serial Communication
12. LED Control using Infrared
13. Displaying Current Date and Time on 16x2 LCD
14. Switching Control of AC Load using Triac
15. Voltage Regulation Across AC Load using Triac
16. Switching Control of AC Load Through SMS Text Message

REFERENCE BOOK

Arduino Projects for Engineers - Neerparaj Rai – BPB Publications – Rs. 297/-

B.SC. ELECTRONICS AND COMMUNICATION

APPLIED ELECTRONICS - I (ALLIED)

UNIT - I : SEMICONDUCTOR THEORY

Intrinsic Semiconductor – Extrinsic Semiconductor - Theory of PN Junction diode - Zener Diode - Avalanche Breakdown - Zener Break down - Operation of PNP & NPN Transistor - CB , CE , CC Configuration and Characteristics - Transistor as an Amplifier.

UNIT - II : RESISTORS , CAPACITORS & INDUCTORS

Resistors, Capacitors & Inductors in Series and Parallel - Factors governing the Resistance of a Resistor, Capacitor & Inductor - Colour Coding of Resistors - Energy Stored in a Capacitor - Energy Stored in an Inductor - Various Other Passive & Active Devices – Ohm's & Kirchoff Laws - Series Circuits - Parallel Circuits - Series & Parallel Circuits - Open Circuit - Short Circuit .

UNIT - III : POWER SUPPLY's :

Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Capacitor Filter - Fixed IC Regulated Power Supply using 78XX - Dual IC Regulated Power Supply using 78XX & 79XX .

UNIT - IV : WAVEFORMS :

Sinusoidal Waveform - Non-Sinusoidal Waveform - Peak Value - Peak to Peak Value - Average Value - RMS Value – Period & Frequency Measurement – Use of Digital Multimeter – Use of CRO.

UNIT - V : OSCILLATORS , AMPLIFIERS & FILTERS :

Barkhausen Criterion – Sinsoidal Oscillators : Hartley , Phase Shift & Crystal Oscillator . Non Sinusoidal Oscillators : Astable , Monostable & UJT as a Sawtooth Oscillator. Amplifiers : RC Coupled & Transformer Coupled Amplifiers. Filters : Low Pass , High Pass , Band Pass & Band Reject Filters .

REFERENCE BOOKS :

1. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition
2. Circuits & Networks - Sudhakar - TMH - 4th Edition.

B.SC. ELECTRONICS AND COMMUNICATION

APPLIED ELECTRONICS - II (ALLIED)

UNIT I TRANSDUCERS :

Resistive Transducers – Inductive Transducers - Capacitive Transducers - Piezo Electric Transducer - Thermo Electric Transducers – Temperature Transducers - Sample & Hold Circuit - Instrumentation Amplifier – Microphones & Loud Speakers.

UNIT II : OP – AMP 's

Introduction - The ideal OP-AMP - OP-Amp stages - OP-Amp parameters - Inverting & Non Inverting Amplifier - Adder - Subtractor - Multiplier - Divider - Integrator - Differentiator - V to I Converter - I to V Converter.

UNIT III : IC FABRICATION PROCESS

Basic Planar Process - Fabrication of a Typical Circuit - Active and Passive Components - Fabrication of FET, MOSFET & CMOS - Thin & Thick Film Technology .

UNIT IV : PCB FABRICATION PROCESS

PCB Types – Layout & General Rules – Design Rules For Digital Circuit PCB's – Artwork – Properties & Types of Copper Clad Laminates – Photo Printing – Screen Printing – Types of Etchants – Manual Routing – Auto Routing – Design Rule Check.

UNIT V : COMMUNICATION SYSTEMS

Need For Modulation – Amplitude Modulation & Detection - Frequency Modulation & Detection – AM Transmitter - AM Receiver – FM Transmitter - FM Receiver – Modulation & Detection of : PAM – PPM – PWM – PCM.

REFERENCE BOOKS :

1. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition
2. PCB Design – Walter.C. Bosshart – TMH
3. Electronic Communication Systems - Kennedy - TMH – IV Edition .

B.SC. ELECTRONICS AND COMMUNICATION

APPLIED ELECTRONICS LAB (ALLIED)

(ANY HARDWARE BASED SIMULATION TOOL MAY ALSO BE USED)

(Any 18 Experiments)

1. PN Junction Diode Characteristics
2. CE Input Characteristics
3. CE Output Characteristics
4. Colour Coding of Resistors
5. Ohm's Law
6. Kirchoff's Current Law.
7. Kirchoff's Voltage Law.
8. Resistors in Series & Parallel
9. Capacitors in Series & Parallel
10. Measurement of Amplitude & Frequency Using CRO.
11. NAND as a UNIVERSAL GATE (AND / OR)
12. NOR as a UNIVERSAL GATE (AND /OR)
13. Verification of De Morgan's Theorem.
14. Truth Table Verification of BASIC Gates (Any one gate)
15. Half Adder / Full Adder
16. Half Subtractor / Full Subtractor.
17. Encoder Using 74147 IC
18. Decoder Using 7442 IC
19. Multiplexer Using 74153 IC
20. Demultiplexer Using 74155 IC

21. Clock Generation Using NAND / NOR GATE
22. Full Wave Rectifier With Capacitor Filter .
23. Fixed IC Regulated Power Supply (78XX).
24. Dual IC Regulated Power Supply (78XX & 79XX).
25. Sine Waveform Generation Using Hartley / Colpitt Oscillator
26. Inverting Adder / Non-Inverting Adder Using Op-Amp
27. Subtractor Using Op-Amp
28. Low Pass Filter / High Pass Filter.
29. Amplitude Modulation and Demodulation.
30. Power Amplifier Using LM 380 IC

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER I OR III

ELECTRONICS – I (ALLIED)

UNIT - I : SEMICONDUCTOR THEORY :

Intrinsic Semiconductor – Extrinsic Semiconductor - Theory of PN Junction Dode - Zener Diode - Avalanche Breakdown - Zener Break Down - Operation of PNP & NPN Transistor - CB , CE , CC Configuration and Characteristics - Transistor as an Amplifier.

UNIT - II : RESISTORS , CAPACITORS & INDUCTORS :

Resistors, Capacitors & Inductors in Series and Parallel - Factors Gverning Resistance , Capacitance & Inducatance - Colour Coding of Resistors - Energy Stored in a Capacitor - Energy Stored in an Inductor - Various Other Passive & Active Devices.

UNIT - III : CIRCUIT LAWS :

Ohm's Law - Kirchoff's Current Law - Kirchoff's Voltage Law - Voltage Division - Current Division - Series Circuits - Parallel Circuits - Series & Parallel Circuits - Open Circuit - Short Circuit.

UNIT - IV : WAVEFORMS :

Sinusoidal Waveform - Non-Sinusoidal Waveforms - Peak Value - Peak to Peak Value - Average Value - RMS Value – Period & Frequency Measurement

UNIT - V : PO WER S UP P LY's :

Half Wave Rectifier - Full Wave Rectifier - Bridge Rectifier - Capacitor Filter - Fixed IC Regulated Power Supply using 78XX - Dual IC Regulated Power Supply using 78XX & 79XX.

REFERENCE BOOKS :

1. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition
2. Circuits & Networks - Sudhakar - TMH - 4th Edition.

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER II OR IV

ELECTRONICS – II (ALLIED)

UNIT I - NUMBER SYSTEMS :

Introduction - Binary Number System - Octal Number System - Decimal Number System - Hexadecimal Nmber System - Conversion From One System to Another .

UNIT II : BINARY RULES : Binary Addition - Binary Subtraction - Binary Multiplication - Binary Division -

1's & 2's Complement Subtraction - 9's & 10's Complement Subtraction.

UNIT III : BOOLEAN ALGEBRA :

Logic GATES - NAND as a UNIVERSAL GATE - NOR as a UNIVERSAL GATE - Basis Laws of Boolean Algebra - Principle of Duality – De Morgan's Theorem

UNIT IV - COMBINATIONAL ELEMENTS :

Half Adder - Full Adder - Half Subtractor - Full Subtractor - Encoder - Decoder - Multiplexer – Demultiplexer.

UNIT V : ELECTRONIC CIRCUITS :

Barkhausen Criterion – Sinusoidal Oscillators (Hartley , Phase Shift &Crystal Oscillator) - Amplitude & Frequency : Modulation & Detection – Amplifiers : RC Coupled & Transformer Coupled . Filters : Low Pass , High Pass , Band Pass & Band Reject Filters – Op-Amp's & Their Applications (Addition , Subtraction, Multiplication , Division , Differentiation and Integration).

REFERENCE BOOKS :

1. Digital Circuits & Design– Salivahanan-Vikas Pub - III Edition.
2. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition

B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V ELECTRONICS LAB (ALLIED)

(ANY HARDWARE BASED SIMULATION TOOL MAY ALSO BE USED)

(Any 18 Experiments)

1. PN Junction Diode Characteristics
2. CE Input Characteristics
3. CE Output Characteristics
4. Colour Coding of Resistors
5. Ohm's Law
6. Kirchoff's Current Law.
7. Kirchoff's Voltage Law.
8. Resistors in Series & Parallel
9. Capacitors in Series & Parallel
10. Measurement of Amplitude & Frequency Using CRO.
11. NAND as a UNIVERSAL GATE (AND / OR)
12. NOR as a UNIVERSAL GATE (AND /OR)
13. Verification of De Morgan's Theorem.
14. Truth Table Verification of BASIC Gates (Any one gate)
15. Half Adder / Full Adder
16. Half Subtractor / Full Subtractor
17. Encoder Using 74147 IC
18. Decoder Using 7442 IC
19. Multiplexer Using 74153 IC
20. Demultiplexer Using 74155 IC
21. Clock Generation Using NAND / NOR GATE
22. Full Wave Rectifier With Capacitor Filter .

23. Fixed IC Regulated Power Supply (78XX).
24. Dual IC Regulated Power Supply (78XX & 79XX).
25. Sine Waveform Generation Using Hartley / Colpitt Oscillator
26. Inverting / Non-Inverting Adder Using Op-Amp
27. Subtractor Using Op-Amp
28. Low Pass Filter / High Pass Filter.
29. Amplitude Modulation and Demodulation.
30. Power Amplifier Using LM 380 IC.