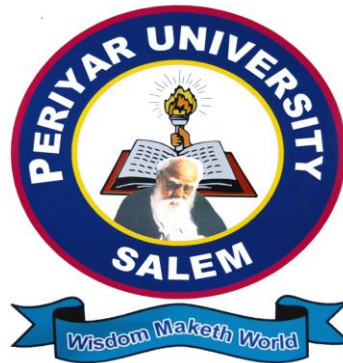


**PERIYAR UNIVERSITY  
PERIYAR PALKALAI NAGAR  
SALEM – 636 011**



**DEGREE OF BACHELOR OF  
SCIENCE  
CHOICE BASED CREDIT SYSTEM**

**SYLLABUS FOR - B.Sc. ELECTRONICS & COMMUNICATION**

**FOR THE STUDENTS ADMITTED FROM THE  
ACADEMIC YEAR 2012 – 2013 ONWARDS**



## **REGULATIONS**

### **EFFECTIVE FROM THE ACADEMIC YEAR 2012 – 2013 & ONWARDS**

#### **1. ELIGIBILITY :**

Candidates seeking admission to the first year of the Bachelor of Science in Electronics & Communication should have passed the Higher Secondary Examination conducted by the Government of Tamil Nadu or an examination accepted as Equivalent thereto by the Syndicate subject to such conditions as may be prescribed from time to time are permitted to appear and qualify for the B.Sc., Electronics and Communication Degree of this university after a course of study of Three Academic Years.

#### **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 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 :**

Tamil /Hindi/Malayalam/ French / German  
English

## **ALLIED SUBJECTS :**

<b>S.No</b>	<b>Semester</b>	<b>Subjects</b>
1.	I	ALLIED I ( MATHEMATICS )
2.	II	ALLIED II ( MATHEMATICS )
3.	II	ALLIED LAB I ( MATHEMATICS )
4.	III	ALLIED III ( C LANGUAGE )
5.	IV	ALLIED IV ( VISUAL BASIC )
6.	IV	ALLIED LAB II ( C & VB )

## **LIST OF CORE SUBJECTS :**

- 1 . SEMICONDUCTOR DEVICES: Semester I : Core: I
- 2 . APPLIED DIGITAL ELECTRONICS : Semester II : Core: II
- 3 . ELECTRONIC CIRCUITS: Semester III : Core: III
- 4 . 8085 MICROPROCESSOR & INTERFACING: Semester IV : Core: IV
- 5 . ELECTRONIC COMMUNICATION SYSTEMS: Semester V : Core: V
- 6 . IC's AND THEIR APPLICATIONS: Semester V : Core: VI
- 7 . PC HARDWARE & TROUBLESHOOTING : Semester VI Core: VII
- 8 . NETWORK COMMUNICATION SYSTEMS: Semester VI Core: VIII
- 9 . **MEDICAL ELECTRONICS : Semester VI Core: IX**

### **OR PROJECT WORK**

## **LIST OF ELECTIVE SUBJECTS :**

### **GROUP A : SEMESTER V (ANY ONE)**

1. 8051 MICROCONTROLLER AND INTERFACING
2. PIC 16F877 MICROCONTROLLER AND INTERFACING

### **GROUP B : SEMESTER V (ANY ONE)**

1. MODERN TELEVISION SYSTEMS
2. RADAR AND NAVIGATIONAL SYSTEMS
3. SATELLITE , CABLE & DTH SYSTEMS

**GROUP C : SEMESTER VI (ANY ONE)**

1. NANO ELECTRONICS
2. MOBILE COMMUNICATION SYSTEMS
3. PROGRAMMABLE LOGIC CONTROLLERS

**LIST OF NON MAJOR ELECTIVE COURSES (NMEC) :**

**GROUP A : SEMESTER III : NMEC - I : PAPER I (ANY ONE)**

- 1 . BASIC ELECTRONICS - I
- 2 . BIO – MEDICAL ELCTRONICS - I
- 3 . CELLULAR PHONES

**GROUP B : SEMESTER IV : NMEC - II : PAPER II (ANY ONE)**

1. BASIC ELECTRONICS - II
2. BIO – MEDICAL ELCTRONICS – II
3. SATELLITE & CABLE TV

**LIST OF SKILL BASED ELECTIVE COURSES (SBEC) :**

1. APPLIED ELECTRIC CIRCUITS: Semester I : SBEC - I
2. POWER ELECTRONICS: Semester II : SBEC - II
3. ELECTRONIC INSTRUMENTATION: Semester V : SBEC - III
4. CELL PHONE FUNDAMENTALS : Semester V:SBEC - IV
5. AUDIO & VIDEO SYSTEMS : Semester VI : SBEC - V
6. PCB DESIGN & FABRICATION : Semester VI: SBEC – VI

**4. EXAMINATIONS :**

The Theory examination shall be of three hours duration for each theory paper at the end of each semester. Unsuccessful candidates will be permitted to appear in the subsequent examination after satisfying other university requirements. Practical examinations will be conducted at the end of the academic year.

**5. SCHEME OF EXAMINATIONS** : The scheme of examinations under CBCS (Choice Based credit System) for different semesters shall be as follows .

SEM	PART	SUBJECTS	TOTAL	HOURS	CREDITS	CIA	EA	TOTAL
			L	T/P				MARKS
I	I	TAMIL – I @	6		3	25	75	100
	II	ENGLISH - I	6		3	25	75	100
	III	CORE - I ( SEMICONDUCTOR DEVICES )	4		4	25	75	100
	III	CORE PRACTICAL - I ( BASIC ELECTRONICS LAB )	1	2				
	III	ALLIED - I ( MATHEMATICS )	4		4	25	75	100
	III	ALLIED LAB - I ( MATHEMATICS )		2				
	IV	SBEC - I ( APPLIED ELECTRIC CIRCUITS )	2		2	25	75	100
	IV	ENVIRONMENTAL STUDIES	1					
	IV	VALUE EDUCATION	2		2	25	75	100
II	I	TAMIL – II @	6		3	25	75	100
	II	ENGLISH – II	6		3	25	75	100
	III	CORE - II ( APPLIED DIGITAL ELECTRONICS )	5		4	25	75	100
	III	CORE PRACTICAL - I ( BASIC ELECTRONICS LAB )	1	2	4	40	60	100
	III	ALLIED - II ( MATHEMATICS )	5		4	25	75	100
	III	ALLIED LAB - I ( MATHEMATICS )		2	2	40	60	100
	IV	SBEC - II ( POWER ELECTRONICS )	2		2	25	75	100
	IV	ENVIRONMENTAL STUDIES	1		2	25	75	100
III	I	TAMIL – III @	6		3	25	75	100
	II	ENGLISH – III	6		3	25	75	100
	III	CORE - III ( ELECTRONIC CIRCUITS )	4		4	25	75	100
	III	CORE PRACTICAL - II ( ELECTRONIC CIRCUITS )	1	2				
	III	CORE PRACTICAL - III ( MICROPROCESSOR )	1	2				
	III	ALLIED - III ( C LANGUAGE )	4		4	25	75	100
	III	ALLIED LAB - II ( C & VB )		2				
	IV	NMEC - I ( FROM GROUP A ) # \$	2		2	25	75	100
IV	I	TAMIL – IV @	6		3	25	75	100
	II	ENGLISH – IV	6		3	25	75	100
	III	CORE - IV ( 8085 MICROPROCESSOR )	4		4	25	75	100
	III	CORE PRACTICAL - II ( ELECTRONIC CIRCUITS )	1	2	4	40	60	100
	III	CORE PRACTICAL - III ( MICROPROCESSOR )	1	2	4	40	60	100
	III	ALLIED - IV ( VISUAL BASIC )	4		4	25	75	100
	III	ALLIED LAB - II ( C & VB )		2	2	40	60	100
	IV	NMEC - II ( FROM GROUP B ) # \$	2		2	25	75	100

			TOTAL	HOURS				TOTAL
SEM	PART	SUBJECTS	L	T/P	CREDITS	CIA	EA	MARKS
V	III	CORE - V ( ELECTRONIC COMMUNICATION SYSTEMS )	5		5	25	75	100
	III	CORE - VI ( IC's & THEIR APPLICATIONS )	5		5	25	75	100
	III	CORE ELECTIVE ( FROM GROUP A)	5		5	25	75	100
	III	CORE ELECTIVE ( FROM GROUP B)	5		4	25	75	100
	III	CORE PRACTICAL - IV ( IC's & COMMUNICATION LAB )	1	2				
	III	CORE PRACTICAL - V ( MICROCONTROLLER LAB )	1	2				
	IV	SBEC - III ( ELECTRONIC INSTRUMENTATION )	2		2	25	75	100
	IV	SBEC - IV ( CELL PHONE FUNDAMENTALS)	2		2	25	75	100
VI	III	CORE - VII ( PC HARDWARE & TROUBLESHOOTING )	5		5	25	75	100
	III	CORE - VIII ( NETWORK COMMUNICATION SYSTEMS )	5		5	25	75	100
	III	CORE ELECTIVE ( FROM GROUP C)	5		5	25	75	100
	III	CORE PRACTICAL - IV ( IC's & COMMUNICATION LAB )	1	2	4	40	60	100
	III	CORE PRACTICAL - V ( MICROCONTROLLER LAB )	1	2	4	40	60	100
	III	CORE PAPER IX ( MEDICAL ELECTRONICS ) OR PROJECT VIVA VOCE *	5		5	25	75	100
	IV	SBEC - V (AUDIO & VIDEO SYSTEMS )	2		2	25	75	100
	IV	SBEC - VI ( PCB DESIGN & FABRICATION )	2		2	25	75	100
	V	EXTENSION ACTIVITIES ( NCC/NSS/YRC 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 6<sup>th</sup> 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**

### **FOR EXTERNAL THEORY :**

**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 INTERNAL THEORY : MAX.MARKS : 25**

**PASSING MINIMUM : 10 MARKS**

**TEST : 15**  
**ASSIGNMENT : 5**  
**ATTENDANCE : 5**

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**TOTAL :25**  
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### **FOR EXTERNAL PRACTICALS :**

**TIME : 3 HOURS ; MAXIMUM MARKS : 60 ( LAB 50 MARKS & RECORD 10 MARKS ) ; PASSING MINIMUM : 24 MARKS**

### **MARK DISTRIBUTION FOR INTERNAL PRACTICALS : MAX. MARKS : 40**

**PASSING MINIMUM : 16 MARKS**

**YEAR THROUGH ; LAB PERFORMANCE : 20**  
**MODEL PRACTICALS : 10**  
**YEAR THROUGH ; LAB ATTENDANCE : 10**

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**TOTAL : 40**  
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## **7. PROJECT WORK OR ONE CORE PAPER :**

The Candidate should submit a **SOFTWARE or HARDWARE or HARDWARE cum SOFTWARE** based project and has to demonstrate it with a Project Report in the University Project Viva Voce Examination conducted at the end of the sixth semester. The candidate shall be declared to have passed the examination only if the candidate secures a minimum of 40% in internals & 40 % in externals respectively .

**MARK DISTRIBUTION FOR PROJECT REPORT : 80 MARKS**  
**MARK DISTRIBUTION FOR VIVA VOCE\_ : 20 MARKS**

**Instead of Project Work ; Core Paper – IX “MEDICAL ELECTRONICS” 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 internals & 40 % in externals respectively in the University examination in each theory paper , practical paper and project .

## **9. CLASSIFICATION OF SUCCESSFUL CANDIDATES**

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in First Class. All other successful candidates shall be declared to have passed in the Second Class.

Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in First Class with Distinction; provided they pass all the examinations prescribed for the course at the first appearance.

Candidates who pass all the examinations prescribed for the course in the first instance and within a period three academic years from the years of admission to the course only are eligible for University Ranking.

## **10. MAXIMUM DURATION FOR COURSE COMPLETION :**

The maximum duration for completion of the UG programme shall not exceed Twelve semesters.

## **11. COMMENCEMENT OF THIS REGULATION :**

These regulations shall take effect from the academic year 2012-2013, i.e., for students who are to be admitted to the first year of the course during the academic year 2012-2013 and thereafter.

## **12. TRANSITORY PROVISION :**

Candidates who are admitted to the UG course of study before 2012-2013 shall be permitted to appear for the examinations under those regulations for a period of three years i.e, up to and inclusive of the examination of April / May 2016. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

## **13. COURSE EQUIVALENCE :**

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

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

#### **14. 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.**

#### **14. ACADEMIC OPPORTUNITIES :**

After successful completion of this course ; students can pursue higher degree courses like M.Sc., (Applied Electronics)/ M.Sc., (Electronics and Communication)/ M.Sc., (Electronics)/ MCA/ M.Sc.,(Computer Science), M.Sc.,(Bio Medical Instrumentation)/ M.Sc., (Nano Science and Technology)/ MBA . etc

#### **15. 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 , EB , 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.

**CBCS : SEMESTER - I : CORE PAPER - I : HOURS PER WEEK - 4**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**  
**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 - 2<sup>nd</sup> Edition
2. A Text Book of Applied Electronics - R.S. Sedha - S. Chand.

**CBCS : SEMESTER – II : CORE PAPER – II : HOURS PER WEEK - 5**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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 Adder and Full Adder – Half and 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 and Arivazhagan – Vikas - III Edition
3. Digital Principles and Application - Malvino and Leach – TMH

**CBCS : SEMESTER - III : CORE PAPER - III : HOURS PER WEEK - 4**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

### **ELECTRONIC CIRCUITS**

#### **UNIT - I : POWER SUPPLY'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 Doubler - Voltage Regulators : Series Regulators - Shunt Regulators - IC Voltage Regulators (78XX & 79XX) – SMPS - UPS.

#### **Unit - II :**

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

#### **Unit - III : AMPLIFIERS :**

Class A Amplifier - Class B Amplifier - Class AB Amplifier - Push Pull Amplifier - Complementary symmetry Push Pull Amplifier - Class C Amplifier - Class D Amplifier - Class S Amplifier - MOSFET Power Amplifier - 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 Applied Electronics – R.S. Sedha – S. Chand.

**CBCS : SEMESTER – IV : CORE PAPER – IV : HOURS PER WEEK - 4**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

### **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.

#### **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 OUT & IN Instruction - Interrupt System of 8085.

#### **UNIT - IV :**

Time Delay Program – Signals on 8255 – I/O Mode – BSR Mode -  
Interfacing With : Switches, LED'S - Single Seven Segment Display -  
EPROM (2764) - RWM (6264).

#### **UNIT - V :**

Interfacing With : ADC 0809 - DAC 0800 – Stepper Motor – Matrix  
Keyboard – Multiple Seven Segment Display – LCD - Traffic Light Control.

#### **REFERENCE BOOKS :**

1. Microprocessor Architecture, Programming and Applications With the 8085/8080A  
– Ramesh.S Gaonkar - New Age International – 5<sup>th</sup> Edition.
2. Introduction to Microprocessor -AP Mathur - TMH – 3<sup>rd</sup> Edition
3. MICROPROCESSOR AND ITS APPLICATIONS – S. MALARVIZHI – ANURADHA Publications
4. FUNDAMENTALS OF MICROPROCESSORS AND MICRO CONTROLLERS – B.RAM –  
DHANPAT RAI – IV TH EDITION

**CBCS : SEMESTER - V : CORE PAPER - V : HOURS PER WEEK - 5**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

## **ELECTRONIC COMMUNICATION SYSTEMS**

### **UNIT 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 Transmitter. - 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.CHAND.



**CBCS : SEMESTER – V : CORE PAPER - VI : HOURS PER WEEK - 5**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

### **IC'S AND THEIR APPLICATIONS**

#### **UNIT I - 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 II - LOGIC FAMILY'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 - 555 TIMER :**

Functional Diagram - Astable Operation - Schmitt Trigger - PPM - FSK Generator - Monostable Operation - Frequency Divider - PWM - Linear Ramp Generator - Missing Pulse Detector.

#### **UNIT V - PHASE LOCKED LOOP :**

Basic Principle - Monolithic PLL - Frequency Translation - Frequency Multiplier - Frequency Divider - AM Detection - FM Detection - FSK Detection.

#### **REFERENCE BOOKS :**

- 1) Linear IC's – Roy Choudhury – NAI – 4<sup>th</sup> Edition. (UNIT I )
- 2) Electronic Circuits – Salivahanan – TMH - II Edition (UNIT II)
- 3) OP-Amps - Gayakwad - PHI - 4<sup>th</sup> Edition - ( UNIT III, IV & V )

**CBCS : SEMESTER – VI : CORE PAPER - VII : HOURS PER WEEK - 5**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**PC HARDWARE & TROUBLESHOOTING**

**UNIT - I :**

Motherboard Components - Support Circuits on Motherboard - Intel 845 Chipset - Physical Memory Organisation - Cache Memory - Shadow Memory - DDR - Common Memory Errors.

**UNIT - II :**

BIOS - BIOS Functions - Battery - Motherboard Connectors - Motherboard Installation - Motherboard Troubleshooting - BIOS Beep Codes.

**UNIT - III :**

**KEYBOARD** : Types - Organisation - Troubleshooting - Ergonomics - Mouse Types - Mouse Connection - Mouse Resolution - Mouse Installation - Mouse Troubleshooting.

**UNIT - IV :**

Hard Disk - Form Factor - Storage Capacity - Disk Geometry - Interfacing - Logical Working & Structure of a Hard Disk - Installation, Formatting & Trouble shooting of a Hard Disk - Pen Drive - CD Drive Working & Installation - Types of DVD - CD & DVD Comparison & Troubleshooting.

**UNIT - V :**

**PRINTER** : Types, Interface & Troubleshooting - Power Supply & Connectors - DVI Connector - Motherboard & Cabinet Form Factor - PC Assembly - **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 - 18<sup>th</sup> - Edition.
6. DOS 6 & 6.22 An Introduction - Manohar Lotia – BPB – Rs.99/-
7. DOS 6 & 6.22 Companion - Satish Jain - BPB – RS.210/-

**CBCS : SEMESTER - VI : CORE PAPER – VIII : HOURS PER WEEK - 5**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

## **NETWORK COMMUNICATION SYSTEMS**

### **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.

### **UNIT - III :**

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

### **UNIT – IV :**

LAN - ETHERNET – Virtual LAN – Fast & Gigabit Ethernet – Token  
Ring – FDDI – Comparison – MAN – DQDB – SMDS – WAN – Packet  
Forwarding - Pure & slotted ALOHA – IEEE standards for LAN, MAN &  
WAN – INFRARED Communication – Bluetooth – Wireless LAN.

### **UNIT V - INTERNETWORKING DEVICES :**

Repeaters - Bridges – Types – Routers – Gateways – Dial up Access  
– Leased lines – DSL Cable Modems – DTE – DCE interface – RS-232 &  
RS-449 Interface – SONET.

### **REFERENCE BOOKS :**

1. DATA COMMUNICATION & NETWORKS - Achyut .S. Godbole & Atul Kahate – TMH – 2ED
2. COMPUTER NETWORKS – ANDREW. S. TANENBAUM – PHI.
3. COMMUNICATION PROTOCOL ENGINEERING - Pallapa Venkataram and S.S.Manvi - PHI.
- 4 . ADVANCED COMPUTER NETWORKING (Concepts and Applications) - Satish Jain – BPB – Rs. 165/-
5. COMPUTER NETWORKS – UYLESS BLACK – PHI - II<sup>ND</sup> EDITION
- 6 . NETWORKING CONCEPTS AND NETWARE – ANAND – HIMALAYA PUBLICATIONS

**CBCS : SEMESTER - VI : CORE PAPER IX : HOURS PER WEEK - 5**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**MEDICAL ELECTRONICS OR PROJECT WORK**

**(Simple Theory Only)**

**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 - Cardiac Stress Test Equipment – Cardio Tocography - Electro Oculography - Electro Retinography - Poly Somnography - Spirometer - Blood Flow Meter - Vascular Doppler - Audiometer

**UNIT III - OPERATION THEATRE EQUIPMENTS :**

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

**UNIT IV - INTENSIVE CARE EQUIPMENTS :**

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 Ultrasound - 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, Fred Weibell, Erich A.Pfeiffer - PHI - 2nd Edition.
3. BIO-MEDICAL INSTRUMENTATION - Dr.M.Arumugam - Anuradha Agencies - 2nd Edition
4. HANDBOOK OF BIOMEDICAL INSTRUMENTATION - R.S.Khandpur – TMH .
5. MEDICAL INSTRUMENTATION, APPLICATION AND DESIGN – John G.Webster - WEL - 3rd Edition
6. INTERNET : Additional Reference for all Units .

**CBCS : SEMESTER - V : CORE ELECTIVE : GROUP - A  
(TO SELECT ONE ELECTIVE IN GROUP A) ; HOURS PER WEEK - 5**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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 - LED'S - Single Seven Segment Display- Matrix Keyboard - Multiple Seven Segment Displays - LCD.

**UNIT - IV :**

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

**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 - 2<sup>nd</sup> Edition.
2. Introduction to Microprocessor -AP Mathur - TMH - 3<sup>rd</sup> Edition (Unit- V)
3. Embedded Systems - Rao - PHI - Rs.395/-
4. Microprocessor & Microcontroller For Engineers & Scientists - Krishna Kant - PHI - Rs.395/-

**CBCS : SEMESTER - V : CORE ELECTIVE : GROUP - A**  
**(TO SELECT ONE ELECTIVE IN GROUP A) ; HOURS PER WEEK - 5**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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 - LED'S - Single Seven Segment Display - Matrix Key Board - Multiple Seven Segment Displays - LCD.

**UNIT – IV :**

Interfacing With : ADC – DAC – Stepper Motor – DC Motor - Traffic Light Control.

**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 – 3<sup>rd</sup> Edition (UNIT - V).

**CBCS : SEMESTER – V : CORE ELECTIVE : GROUP - B  
(TO SELECT ONE ELECTIVE IN GROUP B) ; HOURS PER WEEK - 5  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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

**CBCS : SEMESTER - V : CORE ELECTIVE : GROUP - B  
(TO SELECT ONE ELECTIVE IN GROUP B) ; HOURS PER WEEK - 5  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

## **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 PULICATIONS
5. RADAR SYSTEM & RADAR AIDS TO NAVIGATION – SEN & BATTACHARIYA – KHANNA PUBLICATIONS



**CBCS : SEMESTER - V : CORE ELECTIVE : GROUP - B  
(TO SELECT ONE ELECTIVE IN GROUP B) ; HOURS PER WEEK - 5  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

### **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

**CBCS : SEMESTER - VI : CORE ELECTIVE : GROUP - C  
(TO SELECT ONE ELECTIVE IN GROUP C) ; HOURS PER WEEK - 5  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

## **NANO ELECTRONICS**

### **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

**CBCS : SEMESTER - VI : CORE ELECTIVE : GROUP - C  
(TO SELECT ONE ELECTIVE IN GROUP C) ; HOURS PER WEEK - 5  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

### **MOBILE COMMUNICATON SYSTEMS**

#### **UNIT I – ELEMENTS OF CELLULAR MOBILE SYSTEM :**

Why Cellular Mobile Telephone System – History of 800 MHZ Spectrum Allocation – Trunking Efficiency – A Basic Cellular System – Operation of Cellular Systems – Maximum Number of Calls Per Hour Per Cell – Maximum Number of Frequency Channels Per Cell – Concept of Frequency Reuse – Hand off Mechanism – Cell Splitting.

#### **UNIT II – CELLULAR ANTENNAS :**

Equivalent Circuit of Antennas – The Gain and Pattern Relationship – Engineering Antenna pattern – Antennas at Cell Site – Unique situations of Cell Site Antennas- Mobile Antennas – Power Control – Functions of MTSO – Diversity Receiver.

#### **UNIT III – MEDIUM ACCESS CONTROL :**

Multiplexing – Space Division Multiplexing – Frequency Division Multiplexing – Time Division Multiplexing – Code Division Multiplexing – Spread Spectrum – DSSS-FHSS-SDMA – FDMA – TDMA- Fixed TDM- Classical Aloha – Slotted Aloha – CSMA – DAMA – PRMA – RTDMA – Multiple Access with Pollution Avoidance – CDMA – Spread Aloha Multiple access – Comparison of S/T/F/CDMA.

#### **UNIT IV – MOBILE TELECOMMUNICATON :**

GSM – Mobile Services – System Architecture – Radio Interface – Protocols- Localization and Calling – Handover – Security – Bluetooth – IEEE 802.11

#### **UNIT V – INTELLIGENT CELL CONCEPTS :**

What is the Intelligent Cell – Power Delivery in Intelligent Cell – Processing Gain Intelligent Cells – Application of Intelligent Microcell Systems.

#### **REFERENCE BOOKS :**

1. Mobile Cellular Telecommunication – William CY Lee – TMH – II Edition.
2. Mobile Communications – Schiller – Pearson – II Edition.
3. Wireless Communications – Stalling – Pearson II Edition.
4. Mobile & Personal Communication Systems & Services - Raj Pandya - PHI – Rs.250/-

**CBCS : SEMESTER - VI : CORE ELECTIVE : GROUP - C  
(TO SELECT ONE ELECTIVE IN GROUP C) ; HOURS PER WEEK - 5  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

## **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, Trigonometric 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.

### **TEXT BOOK :**

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

**CBCS : SEMESTER - I : SBEC - I : HOURS PER WEEK - 2**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**  
**(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)**  
**APPLIED ELECTRIC CIRCUITS**

**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.

**CBCS : SEMESTER - II : SBEC - II : HOURS PER WEEK - 2**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**  
**(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)**

## **POWER ELECTRONICS**

### **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 - 2<sup>nd</sup> Edition
2. Power Electronics - Jaganathan - PHI - II Edition - Rs.275/-

**CBCS : SEMESTER - V : SBEC - III : HOURS PER WEEK - 2**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75  
(IN DEPTH THEORY & ANALYSIS NOT REQUIRED) ELECTRONIC  
INSTRUMENTATION**

**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.

**CBCS : SEMESTER - V : SBEC - IV : HOURS PER WEEK - 2**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**  
**(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)**

### **CELL PHONE FUNDAMENTALS**

#### **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. INTERNET : ADDITIONAL REFERENCE FOR ALL UNITS.



**CBCS : SEMESTER - VI : SBEC - V : HOURS PER WEEK - 2**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75  
(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)**

### **AUDIO & VIDEO SYSTEMS**

**UNIT I : MICROPHONES** : Characteristics and Requisites - Types ( Any 3 ) – Comparison Special Microphones – Precautions . **Loudspeakers** : Characteristics – Types ( Any 2 ) – Comparison – Line Source Speakers – Baffles and Enclosures – Woofers & Tweeters – Crossover Networks – Consequence of Mismatch .

**UNIT II : AUDIO AMPLIFIERS** : Types - Characteristics – Amplifier Circuits – PMPO - Controls in Audio Amplifiers – Special Types of Tone Controls. **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 – Tape Cartridge and Cassette Tape – Hi-fi Stereo Reproducing System Stereo Controls.

**UNIT IV : TROUBLESHOOTING IN AUDIO & VIDEO EQUIPMENTS** : 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 – Stereo Amplifier – VCR – DVD Players.

**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.

**CBCS : SEMESTER - VI : SBEC - VI : HOURS PER WEEK - 2**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75  
(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)**

### **PCB DESIGN AND FABRICATION**

#### **UNIT I : PCB BASICS**

Advantages of PCB's – Components of a PCB – PCB Classification – Manufacturing of PCB's. Layout Planning : Electrical Design Considerations – Conductor Patterns – Component Placement Rules. Design Rules for Analogue, Digital and Power Electronic Circuits.

**UNIT II : ARTWORK GENERATION AND IMAGE TRANSFER** Basic Approach to Manual Artwork – Guidelines for Artwork Preparation – Artwork Generation Guidelines. Laminates: Anatomy, Properties and Types. Image Transfer Techniques : Laminate Surface Preparation – Screen Printing – Pattern Transferring Techniques – Printing Process – Photo Printing.

#### **UNIT III : PLATING, ETCHING AND MECHANICAL OPERATIONS**

Electroplating Process – Plating Techniques – Problems in Plating. Etching Techniques : Etching Solutions and Chemistry – Etching Arrangements – Equipment and Techniques – Etching Problems. Mechanical Operations : Need – Cutting Methods – Hole Punching – Drilling.

#### **UNIT IV : FLEXIBLE PCB'S AND SOLDERING**

Construction of Flexible PCB's – Rigid Flex PCB's – Terminations – Advantages – Special Applications. Soldering : Theory – Variables – Materials – Soldering and Brazing – Soldering Tools – Hand Soldering – Mass Soldering – Post Soldering and Cleaning – Rework and Repair of PCB's.

#### **UNIT V : ENVIRONMENTAL CONCERNS**

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

#### **REFERENCE BOOKS :**

- 1 . PCB Design Fabrication, Assembly and Testing – Dr. R.S. Khandpur – TMH.
- 2 . PCB Design & Fabrication – Walter.C. Bosshart – TMH

**For the B.Sc. Computer Science, BCA, B.Sc Information Science, B.Sc. Physics  
Students Admitted From The Academic Year 2012 - 2013 & Onwards.  
CBCS : SEMESTER I OR III : ALLIED PAPER : HOURS PER WEEK - 4  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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 – SMPS – UPS .

**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 – Non Sinusoidal Oscillators – Various Amplifiers - 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 - 4<sup>th</sup> Edition.

**Periyar University, Salem - 636 011.**  
**B.Sc Electronics & Communication**  
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**CBCS : SEMESTER II OR IV : ALLIED PAPER : HOURS PER WEEK - 4**  
**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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 .

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Students Admitted From The Academic Year 2012 - 2013 & Onwards.**

**CBCS : SEMESTER - I&II OR III&IV : ALLIED PRACTICAL : HOURS PER WEEK - 3**

**Maximum Marks : 100 ; Internal Marks : 40 ; External Marks : 60**

**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.
16. Half 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. Inductance Measurement Using Hartley Oscillator or Colpitt Oscillator.
26. Inverting Adder Using Op-Amp
27. Subtractor Using Op-Amp
28. Low Pass Filter or High Pass Filter.
29. Amplitude Modulation and Demodulation.
30. Power Amplifier Using LM 380 IC

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B.Sc Electronics & Communication

For the B.Sc. Maths, B.Sc. Maths (CA), B.Sc. Bio-Chemistry, B.Sc. Micro-Biology & B.Sc. Bio-Technology Students Admitted From The Academic Year 2012 - 2013 & Onwards.

**CBCS : SEMESTER – I OR III : ALLIED PAPER : HOURS PER WEEK - 4**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**ELECTRONICS – I (ALLIED)**

<b><u>UNIT - I : SEMICONDUCTOR THEORY :</u></b>
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.
<b><u>UNIT - II : RESISTORS , CAPACITORS &amp; INDUCTORS :</u></b>
Resistors, Capacitors & Inductors in Series and Parallel - Factors Governing Resistance , Capacitance & Inductance - Colour Coding of Resistors - Energy Stored in a Capacitor - Energy Stored in an Inductor - Various Other Passive & Active Devices .
<b><u>UNIT - III : CIRCUIT LAWS :</u></b>
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 .
<b><u>UNIT - IV : WAVEFORMS :</u></b>
Sinusoidal Waveform - Non-Sinusoidal Waveforms - Peak Value - Peak to Peak Value - Average Value - RMS Value – Period & Frequency Measurement
<b><u>UNIT - V : POWER SUPPLY's :</u></b>
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 .
<b><u>REFERENCE BOOKS :</u></b>
1. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition
2. Circuits & Networks - Sudhakar - TMH - 4 <sup>th</sup> Edition.

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B.Sc Electronics & Communication

**For the B.Sc. Maths, B.Sc. Maths (CA), B.Sc. Bio-Chemistry, B.Sc. Micro-Biology & B.Sc. Bio-Technology Students Admitted From The Academic Year 2012 - 2013 & Onwards.**

**CBCS : SEMESTER – II OR IV : ALLIED PAPER : HOURS PER WEEK - 4**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**ELECTRONICS – II (ALLIED)**

<b><u>UNIT I - NUMBER SYSTEMS :</u></b>
Introduction - Binary Number System - Octal Number System - Decimal Number System - Hexadecimal Number System - Conversion From One System to Another .
<b><u>UNIT II : BINARY RULES :</u></b>
Binary Addition - Binary Subtraction - Binary Multiplication - Binary Division - 1's & 2's Complement Subtraction - 9's & 10's Complement Subtraction .
<b><u>UNIT III : BOOLEAN ALGEBRA :</u></b>
Logic GATES - NAND as a UNIVERSAL GATE - NOR as a UNIVERSAL GATE - Basis Laws of Boolean Algebra - Principle of Duality - De Morgan's Theorem .
<b><u>UNIT IV - COMBINATIONAL ELEMENTS :</u></b>
Half Adder - Full Adder - Half Subtractor - Full Subtractor - Encoder - Decoder - Multiplexer - Demultiplexer .
<b><u>UNIT V : ELECTRONIC CIRCUITS :</u></b>
Barkhausen Criterion - Sinusoidal Oscillators - Amplitude & Frequency : Modulation & Detection - Various Amplifiers - Low Pass , High Pass , Band Pass & Band Reject Filters - Op-Amp's & Their Applications.
<b><u>REFERENCE BOOKS :</u></b>
1. Digital Circuits & Design- Salivahanan-Vikas Pub - III Edition. 2. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition

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**011. B.Sc Electronics &  
Communication**

**For the B.Sc. Maths, B.Sc. Maths (CA), B.Sc. Bio-Chemistry, B.Sc. Micro-Biology &  
B.Sc.**

**Bio-Technology Students Admitted From The Academic Year 2012 - 2013 &  
Onwards. CBCS : SEMESTER - I & II OR III & IV : ALLIED PRACTICAL : HOURS  
PER WEEK - 3**

**Maximum Marks : 100 ; Internal Marks : 40 ; External Marks :  
60**

**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.
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17. Encoder Using 74147 IC
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19. Multiplexer Using 74153 IC
20. Demultiplexer Using 74155 IC
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22. Full Wave Rectifier With Capacitor Filter .
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26. Inverting Adder Using Op-Amp
27. Subtractor Using Op-Amp
28. Low Pass Filter or High Pass Filter.
29. Amplitude Modulation and Demodulation.
30. Power Amplifier Using LM 380 IC



**CBCS : SEMESTER – III : NMEC I : PAPER I : GROUP A  
( TO SELECT ONE IN GROUP A) HOURS PER WEEK - 2  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**BASIC ELECTRONICS – I**

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

<b><u>UNIT - I : SEMICONDUCTOR THEORY :</u></b>
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.
<b><u>UNIT - II : ELECTRONIC COMPONENTS :</u></b>
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.
<b><u>UNIT - III : CIRCUIT LAWS :</u></b>
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.
<b><u>UNIT - IV : RESISTORS , CAPACITORS &amp; INDUCTORS :</u></b>
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.
<b><u>UNIT - V : WAVEFORMS :</u></b>
Sinusoidal Waveform - Non-Sinusoidal Waveforms - Peak Value - Peak to Peak Value - Average Value - RMS Value – Period & Frequency Measurement.
<b><u>REFERENCE BOOKS :</u></b>
1. Electronic Devices & Circuits - Salivahanan - TMH - 2 <sup>nd</sup> Edition
2. Principles of Electronics- V.K. Mehta - S. Chand.
3. Circuits & Networks - Sudhakar - TMH - 4 <sup>th</sup> Edition.

**CBCS : SEMESTER - III : NMEC I : PAPER I : GROUP A  
( TO SELECT ONE IN GROUP A) HOURS PER WEEK - 2**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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 :**

Cardiac Stress Test Equipment – Cardio Tocography – Electro Oculography - Electro Retinography - Poly Somnography - Spirometer - Blood Flow Meter - Vascular Doppler – Audiometer

**UNIT IV : OPERATION THEATRE EQUIPMENTS :**

Boyles Apparatus - Upper Endoscope - Lower Endoscope - ENT Endoscope - Laparoscope

**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, Fred Weibell, Erich A.Pfeiffer - 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. INTERNET : Additional Reference for all Units .

**CBCS : SEMESTER – III : NMEC I : PAPER I : GROUP A  
( TO SELECT ONE IN GROUP A) HOURS PER WEEK - 2  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75  
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.

**CBCS:SEMESTER-IV : NMEC II : PAPER II : GROUP B  
( TO SELECT ONE IN GROUP B) HOURS PER WEEK - 2**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**BASIC ELECTRONICS – II**

**(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)**

<b><u>UNIT I - NUMBER SYSTEMS :</u></b>
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.
<b><u>UNIT II :</u></b>
Logic GATES - NAND as a UNIVERSAL GATE - NOR as a UNIVERSAL GATE - Basis Laws of Boolean Algebra - Principle of Duality - De Morgan's Theorem.
<b><u>UNIT III - COMBINATIONAL ELEMENTS :</u></b>
Half Adder - Full Adder - Half Subtractor - Full Subtractor - Encoder - Decoder - Multiplexer - Demultiplexer.
<b><u>UNIT IV - POWER SUPPLY's :</u></b>
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.
<b><u>UNIT V :</u></b>
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.
<b><u>REFERENCE BOOKS :</u></b>
1. Digital Circuits & Design– Salivahanan-Vikas Pub - III Edition. 2. Electronic Devices & Circuits - Salivahanan - TMH - 2 <sup>nd</sup> Edition 3. Principles of Electronics - V.K. Mehta - S. Chand.

**CBCS : SEMESTER - IV : NMEC II : PAPER II : GROUP B  
( TO SELECT ONE IN GROUP B) HOURS PER WEEK - 2  
Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**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 Ultrasound - 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,  
Fred Weibell, Erich A.Pfeiffer - PHI - 2nd Edition.
3. BIO-MEDICAL INSTRUMENTATION - Dr.M.Arumugam - Anuradha  
Agencies - 2nd Edition
4. HANDBOOK OF BIOMEDICAL INSTRUMENTATION - R.S.Khandpur – TMH .
5. MEDICAL INSTRUMENTATION, APPLICATION AND DESIGN – John  
G.Webster - WEL - 3rd Edition
6. INTERNET : Additional Reference for all Units .

**CBCS : SEMESTER - IV : NMEC II : PAPER II : GROUP B  
( TO SELECT ONE IN GROUP B) HOURS PER WEEK - 2**

**Maximum Marks : 100 ; Internal Marks : 25 ; External Marks : 75**

**(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)**

**SATELLITE & CABLE TV**

**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 .