Syllabus for

B.SC. ELECTRONICS AND COMMUNICATION

( SEMESTER PATTERN )

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

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:
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.
### 5. SCHEME OF EXAMINATIONS

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

#### SEMESTER I

<table>
<thead>
<tr>
<th>PART</th>
<th>SUBJECT</th>
<th>SUBJECT TITLE</th>
<th>TOTAL L</th>
<th>HOURS T/P</th>
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<td>Tamil - I @</td>
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**PERIYAR UNIVERSITY**

### SEMESTER II

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<td>Core VII</td>
<td>PC HW Networking &amp; Troubleshooting</td>
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<td>Core VIII</td>
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<td>Core IX</td>
<td>Biomedical Instruments (or) Project Viva Voce *</td>
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<td>V</td>
<td>Extension Activities (NCC/NSS/YRC/Sports Etc.)</td>
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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 VIth 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 Part V securing following CGPA and Grades shall be declared as follows for Part I or Part II or Part III.
B Sc ELECTRONICS AND COMMUNICATION

<table>
<thead>
<tr>
<th>CGPA</th>
<th>GRADE</th>
<th>CLASSIFICATION OF FINAL RESULT</th>
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<td>9.5 - 10.0</td>
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<td>9.0 and above but below 9.5</td>
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<td>D++</td>
<td>First Class with Distinction</td>
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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:**


17. **JOB OPPORTUNITIES:**

The Students are eligible for placement in Army, Navy, Airforce, Civil Aviation Sectors, Space & Radio Astronomy Sectors, T.V. Broadcasting 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.
UNIT - I:


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:
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 :

Unit II : CIRCUIT LAWS :

Unit III - THEOREMS :

Unit IV - AC CIRCUIT BASICS :

Unit V : REACTANCE, IMPEDANCE & RESONANCE :

REFERENCE BOOKS :
2. Basic Electronics – Bernard Grob – Mcgraw Hill.
UNIT I - NUMBER SYSTEMS:

UNIT II - BOOLEAN ALGEBRA:

UNIT III - COMBINATIONAL ELEMENTS:

UNIT IV - SEQUENTIAL ELEMENTS:

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:
3. Digital Principles and Application - Malvino and Leach – TMH
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


UNIT III:

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

UNIT IV - STATIC SWITCHES:


UNIT V - POWER SUPPLIES:


REFERENCE BOOKS:

1. Colour Coding of Resistors
2. PN Junction 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.
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
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

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SEMESTER III

CORE III - ELECTRONIC CIRCUITS

UNIT - I : POWER SUPPLY’s :


Unit - II :


Unit - III : AMPLIFIERS :


UNIT - IV : FEEDBACK AMPLIFIERS :


UNIT : V : SINUSOIDAL & NON SINUSOIDAL OSCILLATORS :


REFERENCE BOOKS :

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SEMESTER III

NON MAJOR ELECTIVE COURSE I

NMEC I - PAPER I - BASIC ELECTRONICS – I

(IN DEPTH THEORY & ANALYSIS NOT REQUIRED)

UNIT - I: SEMICONDUCTOR THEORY:

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:

UNIT - IV: RESISTORS, CAPACITORS & INDUCTORS:

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

REFERENCE BOOKS:
UNIT I:

UNIT II: METERS & RECORDERS:
Digital Thermometer – Sphygmo Manometer - Electronic Stethoscope – 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:

REFERENCE BOOKS:
1. Biomedical Instrumentation & Measurements – Ananda Natarajan – PHI - Rs.275/-
6. A Text Of Book Of Medical Instruments – Ananthi – New Age International – Rs.275/-
7. Internet : Additional Reference For All Units.
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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/-
7. INTERNET : ADDITIONAL REFERENCE FOR ALL UNITS.
B. Sc. Electronics and Communication

Semester IV

Core IV - 8085 Microprocessor & Interfacing

Unit I - 8085 Microprocessor:

Unit II - Instruction Set:

Unit III:

Unit IV:

Unit V:

Reference Books:
2. Introduction to Microprocessor - AP Mathur - TMH – 3rd 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
19. Multivibrator Using Transistors
21. Single Stage RC Coupled Amplifier. Two
B Sc ELECTRONICS AND COMMUNICATION

22. Stage RC Coupled Amplifier.
23. Emitter Follower.
25. Power Amplifier Using LM 380 IC.
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)
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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.
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.
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.
27. Moving 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:

UNIT IV - POWER SUPPLY's:

UNIT V:

REFERENCE BOOKS:
UNIT I: INTENSIVE CARE EQUIPMENTS:
Pulse Oximeter - Block Diagram & Sensor – Ventilator – Cardiac Monitor - ECG Holder - Defibrillator

UNIT II:

UNIT III: MODERN IMAGING SYSTEMS:

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/-
5. Medical Instrumentation, 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.
UNIT - I:

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/-
3. Composite Satellite & Cable TV – RR Gulati – NAI.
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SEMESTER V

CORE V - ELECTRONIC COMMUNICATION SYSTEMS

UNIT I - PROPAGATION OF RADIO WAVES:

UNIT II - AM GENERATION & TRANSMISSION:

UNIT III - FM GENERATION & TRANSMISSION:

UNIT IV - AM & FM RECEPTION:

UNIT V - PULSE MODULATION:

REFERENCE BOOKS:
1. Electronic Communication Systems - Kennedy - TMH – IV Ed
2. Electronic Communication Systems - Roddy & Collen – PHI – IV Ed
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 - LOGIC FAMILY's:

UNIT III: OP-AMP's:

UNIT IV

UNIT V – 555 TIMER & 565 PLL:

REFERENCE BOOKS:
UNIT I: 8051 MICROCONTROLLER

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:

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

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

ELECTIVE I - PAPER II

PIC16F877 MICROCONTROLLER AND INTERFACING

UNIT I: PIC16F877 MICROCONTROLLER


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:


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/-
UNIT I: PLC BASICS


UNIT II: PLC PROGRAMMING


UNIT III: PLC FUNCTIONS


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


TEXTBOOK

UNIT I - TELEVISION 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 SEPARATOR:
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:

UNIT V - TELEVISION TRANSMISSION & RECEPTION:

REFERENCE BOOKS:
1. Monochrome And Colour Television - Gulathi – Nai – Ii Edition
2. Colour Television Principles And Practice - Gulathi - Nai
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:

UNIT IV - RADIO DIRECTION FINDING & RANGES:

UNIT V - METHODS OF NAVIGATION:

REFERENCE BOOKS:
B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER V

ELECTIVE II - PAPER III

SATELLITE , CABLE AND DTH 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 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.


REFERENCE BOOKS:

2. Modern DTH Digital Satellite Receiver – Manahor Lotia – BPB – Rs.120/-
4. Satellite Communication - Dennis Roddy – TMH
UNIT I: MOBILE DATA COMMUNICATION


UNIT II:


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


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

2. Modern Mobile Phone Repair using Computer Software & Service Devices - Manahar Lotia - BPB - Rs. 120/- (Units IV & V)
3. Modern Mobile Phone Unlocking & Utility Codes For GSM & CDMA Phones - Manahar Lotia - BPB - Rs. 99/- (Unit IV)
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:

UNIT II - BRIDGES:

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:

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

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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


Unit IV : 


Unit V : 

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

Reference Books


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:


Virus: Types - Working - Symptoms - Antivirus.

Reference Books:

1. Modern Computer Hardware Course - Manohar Lotia - BPB - Rs.360/-
2. Ibm Pc And Clones – Govindaraju – Tmh
4. Trouble Shooting, Maintenance & Repairing Pc's–stephen J.bigelow- Tmh – Ii Ed
7. DOS 6 & 6.22 Companion - Satish Jain - BPB – RS.210/-
UNIT I – TRANSMISSION METHODS

UNIT II - NETWORK TOPOLOGIES

UNIT III: NETWORK PROTOCOLS

UNIT IV: LAN TECHNOLOGIES

UNIT V: INTERNET ACCESS & NETWORK SECURITY


REFERENCE BOOKS:
3. Data Communication And Networking (UPDATED EDITION) – Satish Jain – BPB Publications. Rs.270/-
5. Computer Networks – ANDREW. S. TANENBAUM – PHI.
B.SC. ELECTRONICS AND COMMUNICATION
SEMESTER VI
CORE IX - BIOMEDICAL INSTRUMENTS
(Simple Theory Only) OR PROJECT WORK

UNIT I:

UNIT II - RECORDERS AND METERS :

UNIT III - TS :

UNIT IV - INTENSIVE CARETS :

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/-
6. A Text Of Book Of Medical Instruments – Ananthi – New Age Internationa Rs.275/-
7. Internet : Additional Reference for all Units.
UNIT I: QUICK START & COMPONENTS:

UNIT II: EDITING SCHEMATICS:

PCB 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:

UNIT IV:

UNIT V: ENVIRONMENTAL CONCERNS:

REFERENCE BOOKS:
3. PCB Design Fabrication, Assembly and Testing – Dr. R.S. Khandpur – TMH.
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SEMESTER VI

ELECTIVE III - PAPER II

PROGRAMMING USING VERILOG HDL (SIMPLE CONCEPTS ONLY)

Unit – I : Basic Verilog Topics:

Unit – II : Basic Concepts:

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:

Unit – V : Behavioral Modeling:

Text Book:
Unit I : Electronic Defense


Unit II : Weapon Systems


Unit III : Electronic Intercept Systems


Unit IV : Electronic Countermeasure Systems


Unit V : Electronic Counter-Countermeasure Systems


Text Book :

UNIT I - INTRODUCTION & ETHICAL ISSUES:


UNIT II - SELF ASSEMBLY:


UNIT III - INSTRUMENTATION TECHNIQUES:


UNIT IV - NANO ELECTRONICS & CARBON NANO TUBES:


UNIT V - NANO - BIO:


REFERENCE BOOKS:

1. Nano Technology - A Future Technology With Visions - Appin LABS - BPB – Rs.270/-
UNIT I: MICROPHONES:
Characteristics and Requisites - Types (Any 3) – Comparison - Special Microphones – Precautions.

UNIT II: AUDIO AMPLIFIERS:

UNIT III: STEREOPHONY:


UNIT V: COLOUR TV RECEIVER ALIGNMENT AND SERVICING:

REFERENCE BOOKS:
B.SC. ELECTRONICS AND COMMUNICATION

SEMESTER VI

SKILLED BASED ELECTIVE COURSE

SBEC VI - LIFE DEVELOPMENT SKILLS

Unit I – SELF ANALYSIS

Unit II – SELF DEVELOPMENT

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

Unit V: TELEPHONE SKILLS

REFERENCE BOOKS:
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 Amplifier Using Op-Amp
11. Voltage to Current Converter (Grounded load).
14. Square Wave Generation Using Op-Amp
15. Triangular Wave Generation Using Op-Amp
17. Wein Bridge Oscillator Using Op-Amp.
18. 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
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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.
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.
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.
27. Moving Display.
29. Digital Clock.
30. Traffic Light Control.
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.
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.
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.
27. Moving Display.
29. Digital Clock.
30. Traffic Light Control.
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
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.
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
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
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/-
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APPLIED ELECTRONICS - I (ALLIED)

UNIT - I : SEMICONDUCTOR THEORY


UNIT - II : RESISTORS, CAPACITORS & INDUCTORS


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 :


REFERENCE BOOKS :

B.SC. ELECTRONICS AND COMMUNICATION

UNIT I: TRANSDUCERS:

UNIT II: OP-AMP’s

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

UNIT V: COMMUNICATION SYSTEMS

REFERENCE BOOKS:
2. PCB Design – Walter.C. Bosshart – TMH
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
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
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).
25. Sine Waveform Generation Using Hartley / Colpitt Oscillator
26. Inverting Adder / Non-Inverting Adder Using Op-Amp
27. Subtractor Using Op-Amp
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:

UNIT - II: RESISTORS, CAPACITORS & INDUCTORS:

UNIT - III: CIRCUIT LAWS:

UNIT - IV: WAVEFORMS:
Sinusoidal Waveform - Non-Sinusoidal Waveforms - Peak Value - Peak to Peak Value - Average Value - RMS Value – Period & Frequency Measurement

UNIT - V: 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.

REFERENCE BOOKS:
UNIT I - NUMBER SYSTEMS:
Introduction - Binary Number System - Octal Number System - Decimal Number System - Hexadecimal Number 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:

UNIT V: ELECTRONIC CIRCUITS:

REFERENCE BOOKS:
2. Electronic Devices & Circuits - S. Salivahanan - TMH - II Edition
1. PN Junction Diode Characteristics
2. CE Input Characteristics
3. CE Output Characteristics
4. Colour Coding of Resistors
5. Ohm's Law
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