MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI-12, TAMILNADU

B.Sc .Electronics (2017-2018 onwards)

Sl.No	Category of Subjects	Contact Hrs/week	Credits
	SEMESTER V		
34.	Core-Microprocessor and Microcontroller	4	4
35.	Core-Medical Electronics	4	4
36.	Core-Mathematics for Electronics	4	4
37.	Core-Computer hardware and Maintenance	4	4
38.	Major Practical VII- Microprocessors and Microcontrollers Lab	4	2
39.	Major Elective Television Engineering	4	4
40.	Skill Based Common- Personality Development	2	2
41.	Mini Project	4	6
	Subtotal	**30**	**30**
	SEMESTER VI		
42.	Core-Power Electronics	4	4
43.	Core-Semiconductor Fabrication Technology	4	4
44.	Core-Robotics and Automation	4	4
45.	Core- Communication Systems	4	4
46.	Major Practical IX-Power Electronics and System Design Lab	4	2
47.	Major Elective Embedded System and RTOS	4	4
48.	Major Project	6	7
	Subtotal	**30**	**29**

SEMESTER V

V Semester-Core subject: 1

MICROPROCESSORS AND MICROCONTROLLERS

LTPC
4 0 0 4

Preamble: To equip the students to understand architecture and assembly language programming of microprocessor and microcontroller, to understand the concept of interrupts and interfacing with various peripherals and to realize the features of a microcontroller and its timer applications.Prerequisite is knowledge of digital electronics.Upon completion of course student will be able to apply the basic concepts of digital fundamentals to Microprocessor based personal computer system.Able to program microprocessor applications using assembly language programming. Able to illustrate how the different peripherals (8255, 8279, 8253, 8237, 8251) are interfaced with Microprocessor.Able to Program,design, develop and interface complete microcontroller based systems to peripheral devices using 8051 microcontroller.Able to illustrate how the different peripherals are interfaced with microcontroller.

UNIT I
8085 ARCHITECTURE
Architecture of 8085 -Instruction set – Data Transfer, Arithmetic, Logical, Branching and I/O Instruction, Instruction types- various Addressing Modes. Timing sequence- Instruction cycle- Machine cycle- Halt wait state-. ALP- Mnemonic - simple Assembly language program flow chart stack and subroutines- Interrupts.

(12L)

UNIT II
INTERFACE CONTROLLERS
Peripheral device – Programmable peripheral Interface (8255 A) - Programmable Interrupt controller (8259 A) - USART- Serial Communication Interface. Programmable DMA Controller (8257), Interfacing –Analog to Digital Converter- Stepper Motor – Key Board & Display Interface.

(12L)

UNIT III
8051 MICROCONTROLLER
Intel 8051 microcontroller – Block Diagram, pin out – oscillator and clock – Program Counter and Data pointer, A and B registers, flags and program status word – Internal RAM – the Stack and Stack pointer –special functions registers – Internal ROM – I/O Pins, ports and circuits – External memory. Counters, Timers and Addressing Modes

(12L)

UNIT IV

   8051 INSTRUCTIONS

Data exchanges – Logical operations – Byte level operation – Bit level logical operations – Rotate and swap operations – Arithmetic operations – Jump and call instructions – Jump and call program range – Jumps – Calls and subroutines – Interrupts and return.

(12L)

UNIT V

   8051 PROGRAMMING

Assembly Language programming for 8051 Micro controller family – Programs 8–Bit addition – 8–Bit subtraction – 8-Bit Multiplication – 8-Bit Division - Greatest and smallest number in an array – ascending and Descending –Interfacing Keyboard– Interfacing LED, LCD Display– A/D and D/A Interfacing.

(12L)
(Total: 60L)

   BOOKS FOR STUDY:

1. Microprocessor and Interfacing: Programming and Hard ware, Douglas V.Hall,Mc GrawHill, New York (1988)
2. Microprocessor Architecture Programming and applications with 8085/ 8080A. S.Ramesh Goankar, Wiley Eastern Limited(1986)
3. Digital systems & Microprocessor Douglas V.Hall, Mcgraw Hill.
4. Microprocessor- Srinath, PHI Ltd.
5. 8051 Micro controller Architecture, Kennath J. Ayala, Programming and Applications, Penram International Publishing
6. Microprocessor Principles and Applications – 2_{nd} Edition, Gilmore – Tata McGraw Hill.

MEDICAL ELECTRONICS

LTPC
4 0 0 4

Preamble: To equip the students to understand various bio-potentials and Transducers, various systems and measuring instruments related to human body andworking principles of medical instruments. Prerequisite is knowledge of instrumentation and anatomy. On successful completion of the course the students should have understood the concept of bio-potential; concepts of medical instrument its maintenance and develop the troubleshooting skills of medical instruments.

UNIT I
TRANSDUCER AND ITS PRINCIPLES
Active transducers-passive transducers- transducers in bio medical applications-resting and action potentials-propagation of action potentials-bio electric potentials- bio potential electrodes.

(12L)

UNIT II
THE HEART AND CARDIO VASCULAR SYSTEM
Blood pressure-characteristics of blood flow-heart sounds-electro cardio graphy ECG Recorder Principles-measurement of blood pressure, blood flow and cardiac output-pletnysmography- measurement of hearts sounds.

(12L)

UNIT III
PATIENT CARE AND MONITORING
 The elements of intensive care monitoring-diagnosis calibration and reparability of Patient monitoring equipment-pace makers-defibrillators.

(12L)

UNIT IV
PSYCHO PHYSIOLOGICAL MEASUREMENTS
Testing motor responses-sensory measurements –bio feed back instrumentation-bio telemetry introduction physiological parameters- bio telemetry components-application of telemetry.

(12L)

UNIT V
IMAGING SYSTEM
 X-ray machine-computer tomography (CT scanner) - Magnetic Resonance Imaging system- Ultra sonic imaging system. Colour Doppler.

(12L)
(Total: 60L)

TEXT BOOKS

1. Bio medical instrumentation and measurements – Leslie Cromwell, Fred J.Weibell and Erich A Pfeiffer-PHI, second edition-1996

2. Hand book of Bio medical instrumentation- R.S.Khandpur, Tata McGraw Hill 1997   (Unit V: Chapter 19, 20, 21).

MATHEMATICS FOR ELECTRONICS

LTPC
4 0 0 4

Preamble: To equip the students to identify and classify the numerical problem to be solved choose the most appropriate numerical method for its solution based on characteristics of the problem to understand the characteristics of the method to correctly interpret the results and to understand the basic methods, algorithms and programming techniques to solve mathematical problems.Prerequisite is high school mathematics.Upon completion of this course students will be well versed in solving Homogeneous difference equations,Interpolation.Find solution of variousequation using various methods.

UNIT I
FINITE DIFFERENCES
Difference table operator E, Δ, D-Relations between these operators-Difference equations-Linear difference equation Homogeneous linear difference equation with constant coefficients

(12L)

UNIT II
INTERPOLATION USING FINITE DIFFERENCES
Newton Gregory formula for forward interpolation-Divided differences-properties-Newtons formula for unequal intervals-Lagranges formula-Relation between ordinary differences and divided differences

(12L)

UNIT III
SOLUTIONS OF ALGEBRAIC AND TRANSCEDENTAL EQUATION
 Iterative method, Bisection method, Newton raphson method. Solution of simultaneous Linear equations-Gauss method-Gauss Jordan method –Iteration method-Gauss Seidel method

(12L)

UNIT IV
THEORY OF EQUATION
Relation between roots and coefficients-Transformation of equation

(12L)

UNIT V
RECIPROCAL EQUATION
Approximate solution of equation-Newton's method and Horner's method

(12L)
(Total: 60L)

BOOKS FOR STUDY

1. Mathematics For Electronics-K.C Pillai
2. Numerical analysis-Armugam and Isaac
3. Numerical analysis-Gupta and Kapoor
4. Theory ofequation-Armugam and Isaac
5. Algebra-Manikavasagam pillai

COMPUTER HARDWARE AND MAINTENANCE

LTPC
4 0 0 4

Preamble: To equip the students with basic knowledge of Architecture and Design of a Personal Computer and Related Peripherals used in everyday life and to enable the student to get a detailed knowledge of all the hardware components of a personal computer and different interfaces and to understand different storage media.. Prerequisite needed is background of the basic science and computers.Students on completion of this course will understand the components on the motherboard**,** can address issues related to CPU and Memory.They will have good knowledge on Data storage devices andtroublshooting techniques related to it.

UNIT I
COMPUTER HARDWARE OVERVIEW
Computer organization – PC hardware – Functional block of a PC – Buses – Bus concept – Bus cycle – Bus interface unit – Peripheral devices – Keyboard – CRT display – Monitor – Printer – Floppy disk drive – SMPS

(12L)

UNIT II
MOTHER BOARD FUNCTIONS
Functional units and inter communication – Reset logic – CPU nucleus logic – DMA logic – Wait state logic – Bus arbitration logic – RAM logic – NMI logic – Speaker logic – Mode switch input logic – New generation mother board

(12L)

UNIT III
FLOPPY DISK CONTROLLER
 Floppy disk controller overview – Disk format – FDC system interface – FDD interface – Overall operation of floppy disk subsystem – New generation floppy disk controller Display adapter introduction – CRT display – 6845 CRT controller – CGA & AGA – Device interface

(12L)

UNIT IV
HARD DISK CONTROLLER AND PRINTER
 Overview of HDC organization – Disc drives types and interface – Hard disk card – Hard disk format Printer introduction: Centronics interface programming – Programming sequence – Hardware overview – Printer controller

(12L)

UNIT V
     TROUBLE SHOOTING

Types of faults – Hardware and software – Nature of faults – Solids and intermittent – Fault elimination process – Systematic troubleshooting – FDC & HDC problems – CRT monitor problems – Keyboard problems – SMPS problems.

(12L)
(Total: 60L)

TEXT BOOK

1. Govinda Rajulu B, ―PC IBM and Clones – Hardware, Troubleshooting and Maintenance, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1991

MICROPROCESSOR AND MICROCONTROLLER LAB

LTPC
0 0 4 2

All experiments have to be carried out compulsorily from A and B

A. Microprocessor Lab

1. Program for 8 Bit Addition and Subtraction
2. Program for16 Bit Addition and subtraction
3. Program for 8 Bit Multiplication and division
4. Program for 16Bit Multiplication and Division
5. Program for Square and Square root of a number
6. Program for Sorting and Searching
7. Program for Smallest and Largest number in an array.
8. Program for Reversing a String
9. Program for Fibonacci series.
10. Program for Factorial of a number
11. Program for B.C.D to Binary, Binary to B.C.D, A S C I I to Binary,
12. Binary to ASCI I Conversion
13. Six letter word display.
14. Rolling display
15. Interfacing seven segment display to display any character.
16. Program to display Time(Hours and Minutes)
17. Program for 1's complement and 2's complement of 8 bit and 16 bit data
18. Interfacing Traffic light controller
19. Interfacing Stepper motor control
20. Interfacing Matrix Keyboard
21. Interfacing A.D.C
22. Interfacing D.A.C
23. Study of 8255 chip and generation of

      1. Square wave
      2. Triangular wave
      3. Saw Tooth wave

B. Microcontroller 8051 Lab

1. Addition – 8 bit, 16 bit.
2. Subtraction – 8 bit, 16 bit.
3. Multiplication 8 bit
4. Division 8 bit
5. Array addition (multibyte)
6. Logical Operations – AND, OR, NOT
7. Decimal to ASCII and ASCII to Decimal.
8. Decimal to Hexa and Hexa to Decimal.
9. Ascending Order.
10. Descending Order
11. Up/down Counter
12. Block data transfer
13. Interfacing with LCD.
14. Interfacing with Matrix Keypad.
15. Square wave generator
16. Interfacing with ADC.
17. Interfacing with DAC.
18. Digital Clock.
19. Interfacing with Stepper Motor.

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(Select any one course 1 or 2)

1. TELEVISION ENGINEERING

LTPC
4 0 0 4

Preamble: To equip the students to understand various aspects ofTelevision Technology which has now become a vital tool to the information revolution that is sweeping across the countries of the world. The syllabus aims at a comprehensive coverage of Television Systems with all the new developments in Television Engineering.Prerequisite is basic electronics and science.On completion of the course student will be well versed with TV Pictures, composite Video Signal, Receiver Picture Tubes and Television Camera Tubes, principles of Monochrome Television Transmitter and Receiver systems, Various Color Television systems with a greater emphasis on PAL system. And the advanced topics in Television systems and Video Engineering

UNIT I
ELEMENTS OF TELEVISION SYSTEM:
 Basic block schematic of television transmitter and receiver, Analysis of Television pictures, Scanning, human factor consideration, flicker, interlaced scanning, number of scanning lines, Horizontal and vertical resolution, Composite video signal, video signal dimensions, channel bandwidth, vestigial side band transmission, channel bandwidth and allocations for colour transmission.

(12L)

UNIT II
TELEVISION CAMERA AND TRANSMITTERS:
Photoelectric effects, Working principle of image orthicon, vidicon, plumbicon, CCD, structure of CCD and its working, Monochrome and Colour television camera: block schematic explanation, TV transmitters: Positive and negative modulation and its comparison, Colour TV picture tubes: purity and convergence, Delta gun, PIL, Trinitron tubes, LCD screens.

(12L)

UNIT III
MONOCHROME AND COLOUR RECEPTION:
Monochrome receiver: Detailed block schematic, Antenna system,RF section,IFsection,VSB correction,Choice of intermediate frequencies,Picture Tube circuitary and controls, Sound signal seperation,Sound section,Sync Processing and AFC circuit, horizontal and vertical deflection circuits Low voltage Power supply,EHT Power supply, SMPS and block schematic explanation,

(12L)

UNIT 1V
     COLOUR TELEVISION:

Compatibility consideration, Colour response of human eye, Three colour theory, additive mixing of colours, chromaticity diagram, Luminance and chrominance, colour difference signal and its generation, Polarity of colour difference signal, Frequency interleaving and Colour burst signal, delay lines, Basic colour television systems: PAL and NTSC, Block schematic explanation.

(12L)

UNIT V
     TELEVISION APPLICATIONS:

CCTV and its functional block schematic, Cable television: converters, cable connections, and Satellite television: Dish antenna, LNB, down converters, Video discs: VCD and DVD, Digital recording, LASER source, High definition television.

(12L)
(Total: 60L)

BOOKS FOR STUDY:

1. Monochrome and colour television: R R Gulati, Wiley Eastern.
2. Colour Television, Theory and Practice: S P Bali, Tata Mc Graw Hill.
3. Television engineering: A M Dhake, Tata Mc Graw Hill
4. Basic Television Engineering: Bernad Grob, Mc Graw Hill.

V Semester Mini project

LTPC
0 0 4 6

Course Objectives
- To develop skills to formulate a technical project.
- To give guidance on the various tasks of the project and standard procedures.
- To teach use of new tools, algorithms and techniques required to carry out the projects.
- To give guidance on the various procedures for validation of the product and analyse the cost effectiveness.
- To provide guidelines to prepare technical report of the project.

Course Outcomes
1. Formulate a real world problem, identify the requirement and develop the design solutions.
2. Identify technical ideas, strategies and methodologies.
3. Utilize the new tools, algorithms, techniques that contribute to obtain the solution of the project.
4. Perform test and validate through conformance of the developed prototype and analysis the cost effectiveness.
5. Explain the acquired knowledge through preparation of report and oral presentations

Mini Project shall be a group activity with a maximum of 5 students in a group.

Students are adviced to select topics of their own interest in hardware and develop their hardware skills by designing a circuit of their own.Periodical assesment may be done to evaluate their skills.

VI SEMESTER

VI Semester-Core subject: 1

POWER ELECTRONICS

LTPC
4 0 0 4

Preamble: To equip the students with a basic knowledge in power devices. Learn the working of power devices . Learn the basics of inverters and static switches To learn the circuits dc choppers and power supplies To study the basics of battery charging, DC motors welding. This subject presents the principles and applications of industrial and power electronics.

Prerequisites are basic electronics. On successful completion of the course the students should have: Developed the circuit designing skills in power electronics. Understood the concepts in industrial electronics system design.

UNIT I
POWER DEVICES:
Need for semiconductor power devices, Power diodes, Enhancement of reverse blocking capacity, Introduction to family of thyristors. Silicon Controlled Rectifier (SCR): structure, I-V characteristics, Turn-On and Turn-Off characteristics, ratings, Factors affecting the characteristics/ratings of SCR, Gate-triggering circuits, Control circuits design and Protection circuits, Snubber circuit.

(12L)

UNIT II
DIAC AND TRIAC:
Basic structure, working and V-I characteristic of, application of a Diac as a triggering device for a Triac. Insulated Gate Bipolar Transistors (IGBT): Basic structure, I-V Characteristics, switching characteristics, device limitations and safe operating area (SOA) etc. Power MOSFETs: operation modes, switching characteristics, power BJT, second breakdown, saturation and quasi-saturation state.

(12L)

UNIT III
CHOPPERS:
 basic chopper circuit, types of choppers step-down chopper, step-up chopper, operation of d.c. chopper circuits using self commutation, cathode pulse turn-off chopper, load sensitive cathode pulse turn-off chopper (Jones Chopper), Morgan's chopper Application of SCR: SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifiers with inductive & non-inductive loads; AC voltage control using SCR and Triac as a switch.

(12L)

UNIT IV

    D.C MOTORS:

Motor Principle-Comparison of motor and generator action. – AC motors – Induction motors – Speed control – Synchronous motors .Relays and their characteristic and applications

                                             (12L)

UNIT V

    WELDING

Welding – Resistance welding – Seam welding –Heating, Induction heaters – High voltage DC transmission – Fan regulator using TRIAC. Electromechanical Machines: Principle of operation Thyristor based speed control of dc motors, AC motor.

                                             (12L)

                                      (Total: 60L)

BOOKS FOR STUDY

1. Power Electronics, P.C. Sen, TMH
2. Power Electronics & Controls, S.K. Dutta
3. Power Electronics, M.D. Singh & K.B. Khanchandani, TMH
4. Power Electronics Circuits, Devices and Applications, 3rd Edition, M.H. Rashid, Pearson Education
5. Power Electronics, Applications and Design, Ned Mohan, Tore.
6. Power Electronics, K. HariBabu, Scitech Publication.
7. Power Electronics, M.S. Jamil Asghar, PHI.
8. A Textbook of Electrical Technology, B.L. Thereja, A.K. Thereja, S.Chand
9. Industrial electronics – G.K. Mithal, Khanna Publications – Delhi – 15th Ed. 1992.
10. Industrial and power electronics – C. Harish – Raj Umesh Publications – 4th Edn. 1992.
11. Basic electronics and linear circuits – N.N. Bhargava, D.C.Kulsheshtha and S.C.Gupta – Tata McGraw Hill - 1987.

SEMICONDUCTOR FABRICATION TECHNOLOGY

LTPC
4 0 0 4

Preamble: To equip the students with basic understanding in Semiconductor fabrication technology and VLSI devices. Providing exposure to different methods of VLSI design and the principles behind such design. To understand the concepts of MOSFETs to analyze the working of various MOS based invertors. Pre-Requisite is Electronics devices, Electronics Circuits, IC Technology. On completion of course Students will be able to: Understand various VLSI design methodologies and fabrication techniques required for modern VLSI circuits. Apply basic concepts of MOSFETs to analyze the working of various MOS based invertors.   Realize and implement various Boolean functions using CMOS invertors. Understand the working and design of different types of semiconductor memories to meet needs related to storage of large data in very small area.

UNIT I
INTRODUCTION
General classification of integrated circuits – Scale of integration – Advantages over discrete components.   **(12L)**

UNIT II
THICK FILM TECHNOLOGY
 Features of hybrid IC technology – Thick film conductors – Dielectric – Resistors – Thick film processing – Thick film substrate – Design ideas – Advantages and applications.

(12L)

UNIT III
THIN FILM TECHNOLOGY
Thin film conductors – resistors – dielectric – substrates – thin film processing – Advantages and applications – Monolithic IC process : Growth and refining of Si crystals – Substrate slicing and polishing – Wafer preparation – Diffusion – Ion implantation – Oxidation – Photolithography – CVD – Epitaxial grown – Metallization – Monolithic resistors and capacitors.

(12L)

UNIT IV
MODERN VLSI DEVICES
Introduction – Modern VLSI devices – High field effect – MOSFET devices – long channel & short channel MOSFET.

(12L)

UNIT V
BIPOLAR DEVICES

Bipolar devices – n.p.n. transistor – characteristics of typical n.p.n. transistor – Bipolar device design – Design of emitter, base and collector region – concept of HDL.

(12L)
(Total: 60L)

TEXT BOOKS

1. Integrated Circuits (K.R. Botkar). Unit (i, ii, iii).
2. Fundamentals of Modern VLSI Devices by Yuan Taur and Tak H. NING
   Cambridge Publishers. Unit (iv and v)

BOOKS FOR REFERENCE:

1. Basic VLSI Design Systems and Circuits by Dougles A. Pucknell and Kamran Eshragian, PHI.
2. Device Electronics for Integrated Circuits – Richard Maller.
3. Integrated Electronics – Millman & Halkars.
4. VLSI Technology – S.M. Sze.

ROBOTICS AND AUTOMATION

LTPC
4 0 0 4

Preamble: To equip the students with fundamental knowledge about Robotics its working and its role in automation and its applications.To learnabout programming of a robot,its industrial application.To learn about various drives,Actuators and sensors.Study the role of CNC machines in automation.Learn about Programmable Logic Controllers.Prerequisite is knowledge of instrumentation and electronics Upon completion of the course the student should understand the Basic concepts and the applications of robots in automation.CNC machines and PLC Controllers.

UNIT I
INTRODUCTION
Introduction Robotics and programmable automation, historical background, laws of robotics, robot definition, robot anatomy and systems, human systems and robotics. Specification of robotics

(12L)

UNIT II
ROBOT DRIVES
Actuators and control, Function of drive systems, general types of fluids, pump classification pneumatic system, Hydraulic system, Directional control valves, Process control valves, Rotary actuators electrical drives, DC: motors, stepper motor and drives mechanisms

(12L)

UNIT III
ROBOT END-EFFECTORS
Robot End-Effectors Classification of end-effectors, drive system for grippers, mechanical, magnetic, vacuum and adhesive grippers, hooks, scoops and others devices, active and passive Grippers

(12L)

UNIT IV
SENSORS AND INTELLIGENT ROBOTS
Sensors And Intelligent Robots Artificial intelligence and automated manufacturing, AI and robotics, need for sensing systems, sensory devices, types of sensors, robot vision systems-Robot Languages and programming Different languages, Computer numerical control-Features of CNC-CNC machine control unit CNC software

(12L)

UNIT V
PROGRAMMABLE LOGIC CONTROLLERS (PLC)

Discrete Process control-Logic control, Sequencing-Ladder logic diagrams-Programmable logic controllers-Components of the PLC, PLC operating cycle-Addiditional capabilities of PLC, Programming the PLC-Personal computers using soft logic. Introduction to HMI, DCS and SCADA systems.

(12L)
(Total: 60L)

TEXT BOOK

l. Robotics techology and flexible automation by S.R. DEB   Tata Mc Graw Hill
2. Mikell P.Groover, "Automation Production systems and Computer Integrated Manufacturing", Prentice-Hall India, New Delhi, 1987. / Pearson Education, New Delhi
3. W. Bolton, "Mechatronics", Pearson Education Asia, 2002.
4. Introduction to robotics, mechnics and control by John J. Craig from Addison Wesley;

REFERENCE BOOKS

1. Robotics principles and practice   by Dr. K.C. Jain and Dr. L.N Agarwal from Khanna publishers
2. Introduction to robotics, mechnics and control by John J. Craig from Addison Wesley;
3. Mikell P. Groover, "Industrial Robotics - Technology, Programming and Applications", McGraw Hill, New Delhi, 1986
4. K.S. Fu, R.C. Gonzalez and C S G Lee, "Robotics: Control, Sensing, Vision and Intelligence", McGraw Hill, New Delhi, 1987.

COMMUNICATION SYSTEM

LTPC
4 0 0 4

Preamble: To equip the students with fundamental knowledge about various forms of communication   such as Optical fiber transmission,Cable Transmission,Telephone instruments,Telephone switching and transmission,Cellular phones and satellite communications ,Prerequisite is knowledge of electronics .On completion of this course student will be well versed in Opticalfibre transmission media,its connections its coupling devices,Telephone instrument and signal transmission.Operation of telephone exchange,Parts of telephone.Cellular phones its transmission and satellite communications

UNIT-I
OPTICAL FIBER TRANSMISSION MEDIA
Optical Communication-Advantages of optical fibers-Block diagram of an Optical fiber communication system.Optical fiber construction, Light Propogation-Refraction, Refractive index, Snells law-Optical fiber configurations-Coupling fibers-Fiber splicing-Optical fiber connections-Coupling losses;Optical sources-L.E.D's,ILD,Light Detectors-PIN Diodes.

(12L)

UNIT –II
TELEPHONE INSTRUMENT AND SIGNALS
Introduction-Carbon granule transmuitter,Receiving transducer,Simple local battery telephone circuit-Functions of Telephone set,Block diagram of Telephone set,Basic telephone call procecdures,Call progress tones and signals-Dial tone,DTMF tone,Dial Pulse,Station busy,Equipment busy,Ringing,Ring-back,Receiver on/off hook,Cordless Telephones,Caller ID,Electronic telephones

(12L)

UNIT –III
PUBLIC TELEPHONE NETWORK AND SWITCHING
Instruments,Local Loops,Trunk Circuits and Exchanges,Local central office Telephone Exchanges,Operator assisted local exchanges,Automated central office switches and exchanges,Matrix switching,Step by step switching.

(12L)

UNIT-IV
CELLULAR TELEPHONE CONCEPT
Cellular Telephone-Fundamental concepts of cellular Telephones:Frequency Reuse,Interference-Co-channel,Adjacent Channel,Cell splitting,Sectoring,Segmentation and Duplication,Cellular system topology,Roaming ,Handoff,Cellular Telephone Network components-Electronic switching center,Cell site controller,Radio Transceiver,System interconnects,Mobile and portable telephone units,Communication Protocols

(12L)

UNIT-V
        SATELLITE COMMUNICATIONS

Keplers Laws,Satellite orbital pattern,Geosynchronous Satellites,Satellite classifications, Spacing and frequency allocation,Satellite antenna Radiation patterns,Footprints,Satellite system link models-Uplink,Transponder,Downlink,Cross-Links.

(12L)

(Total: 60L)

BOOKS FOR STUDY
1. Advanced Electronic Communication systems-Wayne Tomasi, PHI 6th Edition.
2. Telecommunication Systems-P.H Smale, Wheeler Publication 2nd Edition.
3. Optical Fiber Communications-Gerd Kaiser, Mc Graw-hill 2nd Edition.
4. Satellite Communications-Roddy, Mc Graw-hill 4th Edition.

POWER ELECTRONICS AND SYSTEM DESIGN LAB

LTPC
0 0 4 2

All experiments have to be carried out compulsorily from A and B

A .Power Electronics Lab Practical

1. Characteristics of S.C.R
2. Characteristics of U.J.T
3. Characteristics of D.I.A.C
4. Characteristics of Triac
5. Characteristics of Power MOSFET
6. Characteristics of IGBT
7. R Triggering for Thyristors
8. R C Triggering for Thyristors
9. U.J.T Triggering For Thyristors
10. Speed control of D.C Motor
11. UJT Relaxation Oscillator
12. AC Power Control.

B. Electronics Design Lab Practical

Students must use dotted boards or Group boards and interconnect the joints by soldering.

Soldering Practice

1. Design and construction of fixed voltage power supply

2. Design and construction of Dual power supply

2. Design and construction of switching power supply

3. Design and construction of 1.5 to 12 V power supply using multi tap transformer.

4. Design and construction of Burglar alarm using L.D.R

5. Design and construction of Temperature switch using Thermistor

6. Design and construction of Light sensitive switch using Photo diode

7. Design and construction of Audio amplifier using LM 380

8. Design and construction of Timer circuit

9. Design and construction of Decade counter/ Seven segment decoder

10. Design and construction of Logic probe

2. EMBEDDED SYSTEM AND RTOS

LTPC
4 0 0 4

Preamble: To equip the students to undertake the design and development process for embedded computer systems in relation to the environment in which they operate and to know how to integrate embedded hardware, software, and operating systems to meet the functional requirements of embedded applications. Prerequisite is knowledge of microprocessor and microcontroller .On completion of course student will be thorough to the embedded systems, its hardware and software. Learnt devices and buses used for embedded networking.explain programming concepts and embedded programming in C and C++. Explain real time operating systems, inter-task communication and an exemplary case of RTOS

UNIT I
INTRODUCTION TO EMBEDDED SYSTEMS:
Embedded systems - Application of Embedded Systems - processors in the system - Other Hardware units - software embedded to a system - Exemplar embedded system - Embedded system – on - chip (SOC) and in VLSI circuit
.   **(12L)**

UNIT II
DEVICES AND BUSES FOR DEVICE NETWORK:
I/O Device - timer and counting devices - serial communication using I_2C, CAN and USB. Parallel communication using PCI, PCIX and advanced parallel High Speed Buses.
                                                                                          (12L)

UNIT III
DRIVERS FOR DEVICE AND INTERRUPTS SERVING MECHANISM:
Device drives-parallel port devices drive in a system, serial port Device Drivers in a system, Drivers for internal programmable timing Devices – Interrupt servicing Mechanism – Context and the periods for context switching, Deadline and Interrupt Latency.
                                                                                          (12L)

UNIT IV
EMBEDDED SOFTWARE DELOPMENT USING IDE:
Introduction to Integrated development environment (IDE) – programming concepts and embedded programming in Assembly and C – creating a New project – Adding Files to a project – Building a project – Debugging and simulating the application – Getting Embedded software into the Target system.
                                                                                          (12L)

UNIT V
REAL TIME OPERATING SYSTEM (RTOS):
Introduction to basic concepts of RTOS, Basics of real time& embedded system operating systems, RTOS-Interrupt handling, task scheduling; embedded system design issues in system development process-Action plan, use of target system, emulator,use of software tools.
                                                                                          (12L)
                                                                                          (Total: 60L)

TEXT BOOKS

1. Rajkamal,"Embedded System-Architecture, Programming, Design"Tata Mc Graw Hill 2006.
2. Daniel W.Lewis"Fundamentals of Embedded Software" Prentice Hall of India, 2004.

REFERENCE BOOKS

1. David E Simon," An Embedded Software Primer" person Education Asia, 2006.
2. Frank Vahid, Embedded System Design – A Unified hardware & Software Introduction John Wiley, 2002.
3. SriramV.Iyer, Pankaj Gupte, Embedded Real Time Systems Programming"Tata Mc Graw Hill, 2004.
4. Steve Heath, " Embedded System Design"II edition, Elsevier, 2003.
5. Arnold Berger," Embedded System Design: An Introduction to processes, Tools, and Techniques", CMP Books, 2001.
6. Wayne Wolf, "Computers as components" Morgan Kaufmann Publishers, 2005.
7. Douglas V Hall, "Microprocessors and Interfacing: Programming and Hardware", Tata McGraw – Hill, Second Edition, 2001.

PROJECT WORK

LTPC
0 0 6 7

The objective of the project work is to motivate the students for doing research and to inculcate in them the self confidence to work independently. Each student should do an individual project and they can freely choose their own topic of experimental nature. The project should be of <u>investigative</u> type not a hobby project one.

Students are encouraged to take the project work as a challenge so that their project will boost up their industrial career.

Periodic Seminars should be conducted to assess the students. The students should present the progress of the project to their respective guides and get the required assistance from them

At the completion of the project .The student will submit Project Report in the form of Dissertation which will be examined by the examiners.

The examination shall consist of i) evaluation of the dissertation and ii) comprehensive viva-voce