VINAYAKA MISSIONS UNIVERSITY, SALEM
TAMILNADU, INDIA.

FACULTY OF ENGINEERING & TECHNOLOGY

SCHOOL OF ELECTRONIC SCIENCES

B.E- ELECTRONICS & COMMUNICATION ENGINEERING

PART TIME

(Seven Semesters)

AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR

&

V.M.K.V. ENGINEERING COLLEGE, SALEM

CHOICE BASED CREDIT SYSTEM

2012 REGULATION
### I SEMESTER

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Semester I

ENGINEERING MATHEMATICS

(COMMON TO THE BRANCHES MECH,ECE,CSE, CSSE,EEE,EIE,CIVIL,IT,MECHTRONICS,AERONAUTICAL ,ETC,AUTOMOBILE)

(PART TIME)

The syllabus for Engineering Mathematics common to all branches except Bio info and Bio tech approved by the Board of studies held on 28th and 29th July 2012 at VMKV Engineering College, Salem.

UNIT I

MATRICES

Characteristic equation – Eigen values and eigenvectors of a real matrix – Properties of eigenvalues and eigenvectors (Without proof) – Cayley-Hamilton theorem (excluding proof) – Orthogonal transformation of a symmetric matrix to diagonal form.

UNIT II

ORDINARY DIFFERENTIAL EQUATIONS

Solutions of First and Second order linear ordinary differential equation with constant coefficients – Method of variation of parameters – Simultaneous first order linear equations with constant coefficients.

UNIT III

MULTIPLE INTEGRALS AND VECTOR CALCULUS


UNIT IV

LAPLACE TRANSFORMS

UNIT V

APPLICATIONS OF LAPLACE TRANSFORMS

Inverse Laplace transform – Convolution theorem – Initial and Final value theorem-Solution of linear

ODE of second order with constant coefficients and first order simultaneous equation with constant coefficients using Laplace transforms.

Total hours : 60

Lecture Hours: 45

Tutorial Hours: 15

TEXT BOOKS

1. “Engineering Mathematics” by Department of Mathematics, VMU

REFERENCE BOOKS

OBJECTIVE: It is the branch of science which deals with the effects of human activities & modern technology on environment. It creates awareness among the engineering students about environmental pollution and the role of the engineers in conservation of environment.

OUT COME: The students will get the knowledge about environment and they will work their corresponding field with eco friendly. It will protect our environment from pollution.

UNIT – I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES

Definition, scope and importance – need for public awareness- forest resources: use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their ground water, floods, drought, conflicts over water, dams-benefits and problems-mineral resources: use effects on forests and tribal people-water resources: use and over-utilization of surface and exploitation, environmental effects if extracting and using mineral resources, case studies-food resources: world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies-energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies –land resources: land as a resource, land degradation, man induced landslides, soil erosion and desertification –role of an individual in conservation of natural resources-equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets-river/forest/ grassland/hill/mountain.
UNIT – II ECOSYSTEMS AND BIODIVERSITY

Concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers-energy flow in the ecosystem-ecological succession-food chains, food webs and ecological pyramids-introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)-introduction to biodiversity-definition: genetic, species and ecosystem diversity- biogeographical classification of India-value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values-biodiversity at global, national and local levels-India as a mega-diversity nation-hot spots of biodiversity-threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts-endangered and endemic species of India –conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT - III ENVIRONMENTAL POLLUTION

Definition-causes, effects and control measures of: (a) air pollution (b) water pollution (c) soil pollution (d) marine pollution (e) noise pollution (f) thermal pollution (g) nuclear hazards – solid waste management: caused, effects and control measures of urban and industrial wastes-role of an individual in prevention of pollution-pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site-urban / rural / industrial / agriculture

UNIT - IV SOCIAL ISSUES AND THEIR ENVIRONMENT

UNIT – V HUMAN POPULATION AND THE ENVIRONMENT


Total Hours : 45

TEXT BOOK:

1. Raman Sivakumar, Environmental Science and Engineering, Vijay Nicole imprints Pvt.Ltd.

REFERENCE BOOKS :

1. Bharucha Erach, The Biodiversity of India, publishing Pvt. Ahmedabad, India,
OBJECTIVES:

• To enable the student to learn the major components of an electronic system

• To know the correct and efficient ways of knowing various electronic gadgets

PROGRAMME OUTCOMES:

• The broad education necessary to understand the impact of engineering solutions in a global context.

• An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

UNIT I: ELECTRON BALLISTICS AND INTRINSIC SEMICONDUCTORS

Force on charge in electric field - Motion of Charge in uniform and time varying electric fields - Force on a moving charge in a magnetic field - calculation of cyclotron frequency - calculation of electrostatic and magnetic deflection sensitivity.

Energy band structure of conductors, semiconductors and insulators - Density distribution of available energy states in semiconductors - Fermi-Dirac probability distribution function at different temperatures - Thermal generation of carriers - Calculation of electron and hole densities in intrinsic semiconductors - Intrinsic concentration - Mass Action Law.

UNIT II: EXTRINSIC SEMICONDUCTOR AND PN JUNCTIONS

N and P type semiconductors and their energy band structures - Law of electrical neutrality - Calculation of location of Fermi level and free electron and hole densities in extrinsic semiconductors - Mobility, drift current and conductivity - Diffusion current - Continuity equation - Hall effect. Band structure of PN Junction - Current Component in a PN Junction - Derivation of diode equation - Temperature dependence of diode characteristics.

UNIT III: SWITCHING CHARACTERISTICS OF PN JUNCTION AND SPECIAL DIODES

Calculation of transition and diffusion capacitance - Varactor diode - charge control description of diode - switching characteristics of diode - Mechanism of avalanche and Zener breakdown - Temperature dependence of breakdown voltages - Backward diode - Tunneling effect in thin barriers Tunnel diode - Photo diode - Light emitting diodes.
UNIT IV: BIPOLAR JUNCTION TRANSISTORS AND FIELD EFFECT TRANSISTORS

Construction of PNP and NPN transistors - BJT current components - Emitter to collector and base to collector current gains - Base width modulation CB and CE characteristics - Breakdown characteristics - Ebers - Moll model - Transistor switching times.

Construction and Characteristics of JFET - Relation between Pinch off Voltage and drain current - Derivation. MOSFETS - Enhancement and depletion types.

UNIT V: METAL SEMICODUCTOR CONTACTS AND POWER CONTROL DEVICES


TOTAL HOURS: 60

TEXT BOOK:


REFERENCE:

OBJECTIVES:

- To introduce the concepts and techniques associated with the understanding of signals and systems.
- To familiarize with techniques suitable for analyzing and synthesizing both continuous-time and discrete time systems. To provide with an appreciation of applications for the techniques and mathematics used in this course.

PROGRAMME OUTCOMES:

- Apply engineering principles in solving problems relevant to electrical and electronics engineering.
- Apply critical thinking in designing and evaluating components, processes and systems related to electrical and electronics engineering.

UNIT I: CLASSIFICATION OF SIGNALS AND SYSTEMS
Continuous time signals (CT signals), discrete time signals (DT signals) - Step, Ramp, Pulse, Impulse, Exponential, Classification of CT and DT signals - periodic and aperiodic, random signals, CT systems and DT systems, Classification of systems - Linear Time invariant Systems.

UNIT II: ANALYSIS OF C.T. SIGNALS
Fourier series analysis, Spectrum of C.T. signals, Fourier Transform and Laplace Transform in Signal Analysis.

UNIT III: LTI-CT SYSTEMS
Differential equation, Block diagram representation, Impulse response, Convolution integral, Frequency response, Fourier Methods and Laplace transforms in analysis, State equations and Matrix.

UNIT IV: ANALYSIS OF D.T. SIGNALS
Z Transforms and Properties, Spectrum of D.T. signals, Discrete Time Fourier Transform (DTFT)
UNIT V: LTI-DT SYSTEMS
Difference equations, Block diagram representation, Impulse response, Convolution SUM, Frequency response, FFT and Z-transform analysis, State variable equation and Matrix.

TOTAL HOURS: 60

TEXT BOOKS:

REFERENCES:
OBJECTIVE

To provide exposure to the students with hands on experience on basic Engineering practices of Electronics Engineering.

List of Experiments

1. Diode Forward characteristics.
2. Zener Diode characteristics.
3. Input and Output characteristics of BJT.
4. Output characteristics of JFET.
5. Fixed Bias amplifier circuits using BJT.
6. Differential amplifier using BJT.
7. Power supply Full wave rectifier with simple capacitor filter.
9. Measurement of SCR Characteristics

TOTAL HOURS: 45
AIM:

To introduce the concepts of Digital signal processing and DSP Processor. The mathematical analysis of FIR and IIR filter design and simulation using MATLAB are dealt with in detail.

OBJECTIVES

- Structures of Discrete time signals and systems
- Frequency response and design of FIR and IIR filters.
- Finite word length effect
- DSP Processor- TMS320C5X

1. DISCRETE FOURIER TRANSFORMS & FAST FOURIER TRANSFORMS: 9

Introduction to DFT-Efficient computation of DFT properties of DFT -FFT algorithms-Radix-2 and Radix-4 FFT algorithms-Decimation in Time- Decimation in Frequency algorithms-Use of FFT algorithms in Linear Filtering and correlation.

2. IIR FILTER DESIGN: 9

Structure of IIR-System Design time IIR filter from continuous time filter-IIR filter design by Impulse Invariance.Bilinear transformation-Approximation derivatives-Design of IIR filter in the frequency domain.

3. FIR FILTER DESIGN: 9

Symmetric and Antisymmetric FIR filters – Linear phase FIR filters – Windowing technique-Rectangular, Kaiser windows-Frequency sampling techniques-Structure for FIR systems.

4. FINITE WORD LENGTH EFFECTS: 9


5. DIGITAL SIGNAL PROCESSORS: 9

Introduction to DSP architecture-Harvard architecture-Dedicated MAC unit-Multiple ALUs Advanced addressing modes, Pipelining, Overview of instruction set of TMS320C5X and C54X.

TOTAL HOURS: 45

TEXT BOOK:

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AIM
The Aim of this course is to develop a strong foundation in analysis and design of digital electronics.

OBJECTIVES:
1. Understand the basic concepts.
2. Understand concepts of logic gates constructional features.
3. To understand the concepts of gate-level minimization & combinational logic.
4. To analyze synchronous sequential logic.
5. To realize the hazard free circuits and pulse mode sequential Circuits.

1. BASIC CONCEPTS AND BOOLEAN ALGEBRA
Number systems - Binary, Octal, Decimal, Hexadecimal, conversion from one to another, complement arithmetic, Boolean theorems of Boolean algebra, Sum of products and product of sums, Minterms and Maxterms, Karnaugh map, Tabulation and computer aided minimization procedures.

2. LOGIC GATES
RTL, DTL, TTL, ECL, ICL, HTL, NMOS & CMOS logic gates, Circuit diagram and analysis characteristics and specifications, tri-state gates.

3. COMBINATIONAL CIRCUITS
Problem formulation and design of combinational circuits, Adder / Subtractor, Encoder / decoder, Mux / Demux, Code-converters, Comparators, Implementation of combinational logic using standard ICs, ROM, EPROM, EEPROM, Basics of PLD, PAL, PLA and their use in combinational circuit design.

4. SEQUENTIAL CIRCUITS
Flip flops - SR, JK, T, D, Master/Slave FF, Triggering of FF, Analysis of clocked sequential circuits - their design, State minimization, state assignment, Circuit implementation, Registers-
Shift registers, Ripple counters, Synchronous counters, Timing signal, RAM, Memory decoding, Semiconductor memories.

5. FUNDAMENTAL MODE SEQUENTIAL CIRCUITS  9
Stable, Unstable states, Output specifications, Cycles and Races, Race free Assignments, Hazards, Essential hazards, Pulse mode sequential circuits.

TOTAL HOURS: 45

TEXT BOOKS:

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AIM:
To impart the knowledge of basics of electric and magnetic fields and their effects.

OBJECTIVE:
To provide the knowledge on
- Static Electromagnetic fields
- Static Magnetic fields
- Effect of Electric Field in dielectrics
- Effect of Magnetic Fields on ferromagnetic materials
- Time varying Electric and Magnetic fields

1. STATIC ELECTROMAGNETIC FIELDS  9

2. STATIC MAGNETIC FIELD  9
3. ELECTRIC FIELD IN DIELECTRICS
Permittivity, Polarization, Boundary relation, Capacitance, Dielectric strength, Energy and energy density, Poisson's and Laplace equations and applications, Electric Current, Current Density, Ohms law at a point, Resistance and Conductance, Continuity relations for current problems.

4. MAGNETIC FIELD IN FERROMAGNETIC MATERIALS

5. TIME VARYING ELECTRIC & MAGNETIC FIELDS

TOTAL HOURS: 45

TEXT BOOKS:

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AIM

The purpose of this course is to introduce to the students the basics of biasing transistor circuits, low frequency amplifiers, large signal amplifiers, and its frequency response and various rectifiers and power supplies.

OBJECTIVES

❖ To understand the Operating point calculations and biasing circuits for BJT, FET and MOSFET.
❖ To understand the characteristics of transistor and its analysis using h-parameter model.
❖ To understand the working and to find the efficiency of different types of large signal amplifiers.
To understand the basic concept of Frequency response of the amplifier.
To understand the basic operation of rectifiers, filters and power Supplies

1. BASIC STABILITY AND DEVICE STABILIZATION  9

Biasing circuits for BJT, DC and AC Load lines, Stability factor analysis, Temperature compensation methods, biasing circuits for FET's and MOSFET's.

2. SMALL SIGNAL LOW FREQUENCY ANALYSIS AND DESIGN  9

Transistor, FET and MOSFET Amplifiers, Equivalent circuit, input and output characteristics, calculation of midband gain, input and output impedance of various amplifiers, cascode amplifier, Darlington Bootstrapping, Differential amplifier, CMRR measurement, Use of current source in Emitter.

3. LARGE SIGNAL AMPLIFIERS  9

Class A, B, AB and C type of operation, efficiency of Class A amplifier with resistive and transformer coupled load, efficiency of Class B, Complementary Symmetry amplifiers, Thermal stability of Power amplifiers, heat sink design.

4. FREQUENCY RESPONSE OF AMPLIFIERS  9

High frequency equivalent circuits for BJT and FET amplifiers, Calculation of Lower and Higher cutoff frequencies, Bode plot of frequency response, relation bandwidth and rise time, HF amplifiers, Video amplifiers, Optocouplers, BJT modeling.

5. RECTIFIERS AND POWER SUPPLIES  9

Half and Full wave rectifiers, Ripple factor calculation for C, L, L-C and \( \Pi \) section filters, Switch mode power supplies, Linear electronic voltage regulators, Power control using SCR.

TOTAL HOURS: 45

TEXT BOOKS:

REFERENCES:
Aim:

To provide the knowledge of design and implementation of digital circuits using logic gates and flip flops.

Objectives:

Designing the basic digital circuits like adders, subtractors, code converters, magnitude converters using logic gates and counters using flip flops.

List of Experiments:

1. Design and implementation of Adders using logic gates
2. Design and implementation of Subtractors using logic gates
3. Design and implementation of BCD to Excess -3 code converter using logic gates
4. Design and implementation of Binary to Gray code converter using logic gates
5. Design and implementation of 4 bit BCD adder using IC 7483
6. Design and implementation of 2 Bit Magnitude comparator using logic gates
7. Design and implementation of Multiplexer and De-Multiplexer using logic gates
8. Design and implementation of encoder and decoder using logic gates
9. Design and implementation of 3 bit synchronous up/down counter
10. Implementation of SISO, SIPO, and PISO shift registers using flip flops
AIM
To introduce the students about the feedback amplifiers, oscillators, tuned amplifiers, Multivibrators and voltage and current sweep generators.

OBJECTIVES
- To understand the basic concept of feedback and its types and also to know about the working of various types of feedback amplifiers and its analysis.
- To understand the basic concept of working of different types oscillators.
- To understand the working of different types of tuned amplifiers and its analysis.
- To understand the basic working & design of different types of multivibrator circuits.
- To understand the fundamentals of various sweep generator circuits.

UNIT – I: FEEDBACK AMPLIFIER
Types of feedback – effect of feedback amplifier on noise, distortion gain, input and output impedance of the amplification, analysis of voltage and current feedback amplifier.

UNIT – II: OSCILLATORS
Barkhausen Criterion for Oscillation in Feedback Oscillator – Sinusoidal Oscillator – Phase Shift Oscillator – RC and Wein Bridge Oscillator – Analysis of LC Oscillator, Colpitts, Hartley, Clap, Crystal Oscillator.

UNIT – III: TUNED AMPLIFIERS
Resonance Circuits, Unloaded and Loaded Q of Tank Circuit – Bandwidth – Types of Tuned Amplifiers – Analysis of Single Tuned Amplifier – Double Tuned Amplifier-Stagger Tuned Amplifier – Instability of Tuned
Amplifier – Stabilization Techniques, Neutralization and Unilaterization – Class C Tuned Amplifiers and their Application.

UNIT IV WAVE SHAPING AND MULTIVIBRATOR CIRCUITS 9

UNIT V BLOCKING OSCILLATORS AND TIMEBASE GENERATORS 9

TOTAL HOURS: 45

TEXT BOOKS:

REFERENCE BOOKS:
AIM

To provide the basic concepts in the design of electronic circuits using linear integrated circuits and their applications in the processing of analog signals.

OBJECTIVES

- To introduce the basics of Integrated Circuits and its fabrication.
- To familiarize with operational amplifiers and its Characteristics.
- To introduce the applications of Operational Amplifier
- To Introduce about the regulator and filters.
- To introduce ADC/ DAC and PLL.

UNIT – I: Integrated Circuit Fabrication


UNIT – II: Operational Amplifier and its Characteristics


UNIT – III: Operational Amplifier Applications


UNIT – IV: Regulators and Filters

Series Op Amp Regulators – IC Voltage Regulators – 723 General Purpose Regulators – Switching regulators – RC Active Filters – Transformation – State variable Filter – Switched Capacitor Filters – Active Filters using OTA’s.

UNIT – V: D/A and A/D Converters, Timers and PLL


TOTAL HOURS: 45

Text Book:

Reference Books:


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AIM

To provide the basic concepts in information Theory & coding and their applications in the processing of signals.

OBJECTIVES

- To introduce the basics of Source coding.
- To familiarize with Noisy Coding its Characteristics.
- To introduce the channel coding.
- To introduce about the Error control coding and methods.
- To introduce decoding techniques.

UNIT-I: SOURCE CODING

Mathematical model for information source: - Mutual Information - Discrete Entropy-Definition and properties - Joint and conditional entropies - Entropy in the continuous case - Unique decipherability and instantaneous codes - Kraft inequality.

UNIT-II: NOISY CODING

Discrete memory less channel - Classification of channels & channel capacity - Calculation of channel capacity - Decoding schemes - Fano"s inequality - Shannon’s fundamental theorem - Capacity of a band limited Gaussian channel.

UNIT-III: CHANNEL CODING

Channel models: Binary Symmetric channels - Information capacity theorem - Implication of the information capacity theorem - Information capacity of coloured noise channel - Rate distortion theory - Data compression.

UNIT-IV: ERROR CONTROL CODING

Linear block codes: - Cyclic codes, BCH Codes, RS codes, Golay codes, Burst error correcting codes, Interleaved codes, Convolutional codes : Convolutional encoder, code tree, state diagram, trellis diagram - Turbo codes.

UNIT-V: DECODING OF CODES

Maximum likelihood decoding of convolutional codes - Sequential decoding of convolutional codes- Applications of Viterbi decoding.
TOTAL HOURS: 45

TEXT BOOKS:


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AIM:

To provide the knowledge about the different modulation Techniques, Noise performance of AM and FM receivers, Understand the bandwidth, power, and complexity requirements

OBJECTIVE:

- To impart the basic concepts of Amplitude modulation Schemes.
- To impart the basic concepts of Frequency and Phase modulation Schemes.
- To understand the performance of AM and FM Receivers
- To understand the noise performance in the AM and FM modulations.
- To impart the concepts of pulse modulations schemes.

UNIT I BASICS OF ELECTRONIC COMMUNICATION AND NOISE THEORY

Electromagnetic spectrum allocation for various communication systems- Basic communication model - transmitter, receiver and channel – Need for modulation – classification of modulation, Band pass and pass band transmission.

Noise definition- Atmospheric Noise, Thermal Noise, Shot noise, partition noise, flicker noise, transit time noise-noise factor, noise factor for cascaded amplifier (Friss formula) – Noise figure – Equivalent noise temperature, signal to noise ratio.
UNIT II AMPLITUDE MODULATION AND DEMODULATION


Demodulation –Envelope detector, Significance of RC time constant- Square law detector.

UNIT III ANGLE MODULATION AND DEMODULATION


UNIT IV MULTIPLEXING & ANALOG PULSE MODULATION

Multiplexing- TDM, FDM - Analog pulse modulation-Sampling theorem – Nyquist rate – concepts of PAM, PWM, PPM- modulators and demodulators – Noise performance in AM & FM.

UNIT V RECEIVERS AND SYSTEMS

AM Receivers-TRF receivers –Super heterodyne receivers: choice of IF, double conversion technique, Image frequency tracking, AGC-characteristics of receiver. FM Receivers- FM stereo broadcast receivers- AFC – Capture effect.


TEXT Books:


REFERENCE BOOKS

Aim:
To Provide the ability to design the electronic circuits using the basic electronic components.

Objective:
- To study the characteristics of basic amplifiers and power supply

List of Experiments:
Designing, Simulation using PSPICE, Assembling and Testing
1. HWR with and without filters
2. FWR with and without filters
3. Power supplies
4. RC coupled Amplifier
5. Darlington & Cascade Amplifier
6. Emitter follower Amplifier
7. Transistor biasing
8. Class A Power amplifier
9. Class B Power amplifier
10. Differential amplifiers, CMRR Measurements
Aim:

To study the course on antenna theory and propagation of waves.

Objectives:

- To study the EM theory and radiation fundamentals
- To study about wire antenna and arrays
- To study about the aperture antennas
- To study about the antenna measurements
- To study about the wave propagation

UNIT I ELECTROMAGNETIC RADIATION AND ANTENNA FUNDAMENTALS

UNIT II WIRE ANTENNAS AND ANTENNA ARRAYS


UNIT III APERTURE ANTENNAS


UNIT IV SPECIAL ANTENNAS AND ANTENNA MEASUREMENTS


UNIT V RADIO WAVE PROPAGATION


TOTAL HOURS: 45 HOURS

TEXTBOOKS


REFERENCE BOOKS

Aim:

To study the course on Microprocessors and its Applications.

Objectives:

- To study the 8-Bit Microprocessor
- To study about Microcontroller
- To study about the 8086 Processors
- To study about the Peripherals devices and Interfacing
- To study about the Microprocessor Based Systems Design, Digital Interfacing

1.8-BIT MICROPROCESSOR:

8085 Architecture and Memory interfacing, interfacing I/O devices, Instruction set, Addressing Modes, Assembly language programming, counters and time delays, interrupts, timing diagram, Microprocessor applications.

2. MICROCONTROLLER:

Intel 8031/8051 Architecture, Special Function Registers (SFR), I/O pins, ports and circuits, Instruction set, Addressing Modes, Assembly Language Programming, Timer and Counter Programming, Serial Communication, Connection to RS 232, Interrupts Programming, External Memory interfacing, Introduction to 16 bit Microcontroller

3. 80X86 PROCESSEORS:


4. PERIPHERALS AND INTERFACING:

Serial and parallel I/O (8251 and 8255), Programmable DMA Controller (8257), Programmable interrupt controller (8259), keyboard display controller (8279), ADC/DAC interfacing. Inter integrated circuits interfacing (I2C standard).
5. MICROPROCESSOR BASED SYSTEMS DESIGN, DIGITAL INTERFACING:

Interfacing to alpha numeric displays, interfacing to liquid crystal display (LCD 16 x 2 line), high power Devices and Optical motor shaft encoders, stepper motor interfacing, Analog interfacing and industrial control, microcomputer based smart scale, industrial process control system, Robotics and Embedded control, DSP and Digital Filters.

TOTAL HOURS : 45

TEXT BOOKS:


REFERENCES:


AIM:
To understand the organization of a computer, and the hardware-software interface.

OBJECTIVES:
- To know about the various components of a computer and their internals.
- To comprehend the importance of the hardware-software interface, and instruction set architecture.
- To understand the architectural features of superscalar processors.

UNIT I  BASIC STRUCTURE OF COMPUTERS  9
Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II  ARITHMETIC UNIT  9
Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III  BASIC PROCESSING UNIT  9

UNIT IV  MEMORY SYSTEM  9

UNIT V  I/O ORGANIZATION  9

TOTAL HOURS: 45

TEXT BOOKS

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Aim:
To provide the knowledge about various digital modulation and demodulation schemes in communication engineering.

Objectives:
- To impart knowledge on base band modulation.
- To impart knowledge on baseband demodulation.
- To impart knowledge on band pass modulation and detection schemes.
- To introduce the synchronization techniques involved in modulation and demodulation.
- To introduce the communication link and budget analysis.

UNIT I SAMPLING AND QUANTIZATION

UNIT II BASEBAND PULSE TRANSMISSION

UNIT III DIGITAL MODULATION TECHNIQUES
Introduction – ASK- FSK – PSK- coherent modulation techniques-BFSK-BPSK-signal space diagram-probability of error-Coherent Quadrature modulation techniques- QPSK-MSK-signal space diagram-probability of error- Non coherent modulation techniques-M-ary modulation techniques Carrier Synchronization- Timing Synchronization

UNIT IV ERROR CONTROL CODING
Discrete memoryless channels – Linear block codes - Cyclic codes - Convolutional codes – Maximum likelihood decoding of convolutional codes-Viterbi Algorithm, Trellis coded Modulation, Turbo codes.

UNIT V SPREAD SPECTRUM MODULATION

TOTAL HOURS: 45
TEXT BOOKS:

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AIM

To provide the knowledge of assembly language programming of microprocessors and interfacing peripheral devices with microprocessors.

OBJECTIVE

- To write the assembly language program for 8085, 8086.
- To write the programs for communication between microprocessor and peripheral devices.
- To interface ADCs, DACs with microprocessor and learn the real time applications like stepper motor control, key board etc

LIST OF EXPERIMENTS

1. 8085 Assembly language Program (ALP) to add and subtract two 8 bit numbers.
2. 8085 Assembly language Program (ALP) to multiply and divide two 8 bit numbers.
3. 8085 Assembly language Program (ALP) to arrange the numbers in ascending and descending order.
4. 8086 Assembly language Program (ALP) to add and subtract two 8 bit numbers.
5. 8086 Assembly language Program (ALP) to multiply and divide two 8 bit numbers.
6. Interfacing a stepper motor to 8085 processor and operate it in clockwise and anti-clockwise directions.
7. Interfacing an ADC to 8085 processor and generate step, ramp, triangle and square waveforms.
8. Interfacing a keyboard to 8085 microprocessor and display the key number pressed on the 7-segment display.
AIM:
To understand the architecture, recent advances, current practices and trends in computer network, analyze the networking protocols and the contemporary issues in computer networks

OBJECTIVE

- To know about the concepts of Data communication and networks and Physical Layer and different protocols.
- To impart knowledge on Medium Access Layer
- To impart knowledge on Networks Layer
- To impart knowledge on transport protocol.
- To impart knowledge on Application Layer.

UNIT I INTRODUCTION & PHYSICAL LAYER


Physical Layer: Theoretical basics of data communication, guided transmission media, wireless transmission, PSTN, Mobile Telephone Systems, Cable Television.
UNIT II DATA LINK LAYER

Data link layer design issues – framing, error control, flow control – Error detecting codes and Error Correcting codes, Elementary data link protocols – stop-and wait protocol for error free and noisy channel – sliding window protocol – one bit, go back-N and selective repeat.


UNIT III NETWORK LAYER


UNIT IV TRANSPORT LAYER


UNIT V APPLICATION LAYER

DNS-(Domain Name System), Electronic Mail, World Wide Web, Real Time Audio and Video, Content Delivery and Peer-to-peer,

TOTAL HOURS: 60

TEXT BOOKS:

REFERENCE BOOKS:
AIM:
To learn about the VLSI technology

OBJECTIVES:
- To study the MOS transistor and technology
- To study the stick diagram characteristics
- To study the circuit characterization
- To study the VLSI components
- To study the Verilog language

UNIT I MOS TRANSISTOR THEORY AND PROCESS TECHNOLOGY 9
NMOS and PMOS transistors - Threshold voltage - Body effect - Design equations - Second order effects - MOS models and small signal AC characteristics - Basic CMOS technology.

UNIT II INVERTERS AND LOGIC GATES 9
NMOS and CMOS Inverters - Stick diagram - Inverter ratio - DC and transient characteristics - switching times - Super buffers - Driving large capacitance loads - CMOS logic structures - Transmission gates - Static CMOS design - Dynamic CMOS design.

UNIT III CIRCUIT CHARACTERISATION AND PERFORMANCE ESTIMATION 9
Resistance estimation - Capacitance estimation - Inductance - Switching characteristics - Transistorsizing - Power dissipation and design margining - Charge sharing - Scaling.

UNIT IV VLSI SYSTEM COMPONENTS CIRCUITS AND SYSTEM LEVEL PHYSICAL DESIGN 9
Multiplexers - Decoders - comparators - Priority encoders - Shift registers - Arithmetic circuits - Ripple carry adders - Carry look ahead adders - High-speed adders - Multipliers - Physical design - Delay modeling - Cross talk - Floor planning - Power distribution - Clock distribution - Basics of CMOS testing.

UNIT V VERILOG HARDWARE DESCRIPTION LANGUAGE 9
Overview of digital design with Verilog HDL - Hierarchical modeling concepts - Modules and port definitions - Gate level modeling - Data flow modeling - Behavioral modeling - Task & functions - Test Bench.

TOTAL HOURS: 45

TEXT BOOKS:

REFERENCES:
# SEMESTER V

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## AIM

To learn the basic concepts of embedded systems and its applications.

## OBJECTIVES

- To introduce students to the embedded systems, its hardware and software.
- To introduce devices and buses used for embedded networking.
- To explain programming concepts and embedded programming in C and C++
- To introduce the software development tools in embedded systems.
- To introduce the concepts of Real Time Operating System.

## UNIT I INTRODUCTION TO EMBEDDED SYSTEMS


## UNIT II DEVICES AND BUSES FOR DEVICES NETWORK


## UNIT III PROGRAMMING CONCEPTS AND EMBEDDED PROGRAMMING IN C, C++


## UNIT IV SOFTWARE DEVELOPMENT AND TOOLS


## UNIT V REAL TIME OPERATING SYSTEMS

Task and Task States, tasks and data, semaphores and shared Data Operating system Services-Message queues-Timer Function-Events-Memory Management, Interrupt Routines in an RTOS environment, basic design Using RTOS.

**TOTAL HOURS: 45**
TEXT BOOKS:

REFERENCE BOOKS:

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AIM
To introduce the student to various image processing techniques.

OBJECTIVES
- To study the image fundamentals
- To study the mathematical transforms necessary for image processing.
- To study the image enhancement techniques.
- To study image restoration procedures.
- To study the image segmentation and compression techniques.

UNIT I  DIGITAL IMAGE FUNDAMENTALS

Introduction-Elements of Digital Image Processing system- Visual perception and properties of human eye-
Image representation-Image Sampling & Quantization-A simple image model-Some basic relationship between pixels- Image processing applications.

UNIT II  IMAGE TRANSFORMS

Introduction to Fourier transform - Discrete Fourier transform - Properties of two dimensional FT – Separability, Translation, Periodicity, Rotation, Average Value – DCT, DST, Walsh, Hadamard, Haar transforms and their properties.
UNIT III IMAGE ENHANCEMENT

Histogram Modelling, equalization and modification. Image smoothing-Image sharpening- Spatial Filtering-Edge detection - Homomorphic filtering for image enhancement.

UNIT IV IMAGE RESTORATION & MORPHOLOGICAL IMAGE PROCESSING


UNIT V IMAGE SEGMENTATION AND COMPRESSION

Image Segmentation: Detection of discontinuities-Edge linking and boundary detection and boundary representation – Chain Codes & polygon representation – Shape Numbers & Fourier descriptors- Thresholding- Regional Descriptors - Topological Descriptors - Texture

Image Compression: Fundamentals - Image compression models
Lossless compression: Variable-Length Coding - Contents - LZW Coding.
Lossy Compression: Lossy Predictive Coding - Transform Coding - Wavelet Coding.

TOTAL PERIODS: 45

TEXT BOOKS:


REFERENCES:

### AIM

To know and understand communication networks using NETSIM Software and LAN Trainer kit.

### OBJECTIVES

- To study the communication networks characteristics and to analyze various MAC and routing layer Protocols.

### List of Experiments:

1. **PC to PC/ peripherals communication**
   - a. Establish RS232 communication
   - b. Establish Parallel port communication

2. **MAC Layer LAN Protocols**
   - Observe the behavior & measure the throughput, compare the performance with other MAC Layer protocols.
   - a. CSMA/CD at MAC Layer
   - b. Token Bus at MAC Layer
   - c. Token Ring at MAC Layer
   - d. CSMA/CA at MAC Layer

3. **LLC (Logical Link Control) Layer LAN Protocols**
   - Observe the behavior & measure the throughput of reliable data transfer protocols. Compare the performance with other LLC Layer protocols.
   - a. Stop & Wait at LLC Layer
   - b. Sliding Window – Go-Back-N at LLC Layer
   - c. Sliding Window – Selective Repeat at LLC Layer

4. **Routing Algorithm**
   - Performance Study of Routing Algorithms through simulation
   - a. Distance Vector Routing
   - b. Link State Routing

5. **Introduction to Socket Communication in Linux & Windows**
   - a. Socket programming concept in Windows & Linux platforms
   - b. File Transfer between PC’s through sockets

6. **Study of Data Encryption & Decryption techniques by using them in a File Transfer**
AIM

- To introduce the concepts of wireless / mobile communication using cellular environment.
- To make the students to know about the various modulation techniques, propagation methods, coding and multi access techniques used in the mobile communication. Various wireless network systems and standards are to be introduced.

OBJECTIVE:

- To study the Basic wireless communication devices
- To study the wireless systems and standards
- To study the cellular concept and systems design fundamentals.
- To study the mobile radio propagation
- To study the equalization techniques, diversity techniques and speech coding.

UNIT – I: INTRODUCTION TO WIRELESS MOBILE COMMUNICATIONS 5

History and evolution of mobile radio systems, paging, cordless, WLL, Cellular telephones, comparison of Common wireless communication systems.

UNIT – II: WIRELESS SYSTEMS AND STANDARDS 6

AMPS&ETACS, USDC, GSM, CDMA, Digital Cellular Standard, CT, DECT, PACS, PDC, PHS.
UNIT – III: CELLULAR CONCEPT - SYSTEM DESIGN FUNDAMENTALS 10
Introduction, Frequency reuse, Channel assignment strategies, handoff strategies, Interference and system capacity, Trunking and GOS, Improving coverage and Capacity in cellular systems,

4. MOBILE RADIO PROPAGATION 12
Small Scale Fading: Small scale multipath propagation, Impulse response Model of a multipath channel, Parameters of mobile multipath channels, Types of Small Scale Fading.

5. EQUALISATION, DIVERSITY AND SPEECH CODING 12
Speech Coding: Characteristics of Speech Signals, Quantization Techniques, ADPCM, Frequency Domain coding of Speech, Vocoders, LPC.

TOTAL HOURS: 45

TEXT BOOK:

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AIM
To enable the student to become familiar with active & passive microwave devices & components used in Microwave communication systems & to introduce the various optical fiber modes, configurations and various signal degradation factors associated with optical fiber and also to study about various optical sources and optical detectors.
OBJECTIVE

- To study passive microwave components and their S-Parameters.
- To study Microwave Components.
- To study Microwave Tubes Antennas.
- To impart Knowledge on basics of Optical communication and Optical Sources
- To Study about Optical Detectors and Amplifiers

UNIT I INTRODUCTION

Microwave spectrum and bands-characteristics of microwaves-a typical microwave system. Traditional, industrial and biomedical applications of microwaves. Microwave hazards S-matrix – significance, formulation and properties. S-matrix representation of a multi port network, S-matrix of a two port network with mismatched load.

UNIT II MICROWAVE COMPONENTS


UNIT III MICROWAVE TUBES & ANTENNAS

Microwave tubes: O-type – Two cavity Klystrons: structure, resonant cavities, velocity modulation and Applegatediagram, bunching process. Reflex Klystrons- structure, modes and o/p characteristics, electronic and mechanical tuning. M-type – cross-field effects, Magnetrons - types, 8-cavity Cylindrical Travelling Wave Magnetron- Hull cut-off and Hartree conditions, modes of resonance and PI-mode operation, o/p characteristics. HELIX TWT- types and characteristics of slow wave structures, structure of TWT and amplification process (qualitative treatment), Backward Wave Oscillators.


UNIT IV BASICS OF OPTICAL FIBERS AND SOURCES


UNIT V OPTICAL DETECTORS & AMPLIFIERS

Basic concepts, semiconductor amplifier, Erbium-Doped Fiber Amplifier, Raman amplifier, Brillouin amplifier - principles of operation, amplifier noise, signal to noise ratio, gain, gain bandwidth, gain and noise dependencies, intermodulation effects, saturation induced crosstalk, wavelength range of operation.

**TOTEL HOURS: 60**

**TEXT BOOKS:**


**REFERENCE BOOKS:**

AIM

To know and understand how communication is being established at microwave frequencies and using fiber in optical communication.

OBJECTIVES

❖ To have a detailed practical study on microwave equipments
❖ To study the optical devices and to use in the appropriate application

LIST OF EXPERIMENTS

Experiments pertaining to Fiber optics, Optical Communication and Fiber optic sensors

MICROWAVE:

2. Characteristics of Reflex Klystron.
3. Characteristics of Directional Coupler
5. Horn Antenna – Gain and directional Characteristics

OPTICAL COMMUNICATION

1. Numerical aperture determination for fibers
2. D.C. Characteristics of LED and PIN Photo Diode
3. Optical transmission using Analog Modulation
4. Data transmission through Fiber Optic Link.
5. PI Characteristics of LASER diode.
## R2012 PT ECE

### Semester VII

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UNIT I PLANNING

UNIT II ORGANIZING

UNIT III DIRECTING
Creativity and Innovation - Motivation and Satisfaction - Motivation Theories - Leadership Styles - Leadership theories - Communication - Barriers to effective communication - Organization Culture - Elements and types of culture – Managing cultural diversity.

UNIT IV INTRODUCTION TO ETHICS
Moral dilemmas -Uses of Ethical Theories- Engineering As Social Experimentation- Engineer’s Responsibility For Safety-Codes of Ethics-Challenger Case Study

UNIT V ETHICS IN ENGINEERING

TOTAL:45 HOURS

TEXT BOOKS:

REFERENCES:
AIM:

To learn the advanced digital signal processing techniques.

OBJECTIVE:

- To study the parametric methods for power spectrum estimation
- To study Spectrum Estimation
- To study about Linear Estimation and Prediction
- To study adaptive filtering techniques using LMS algorithm and to study the applications of adaptive filtering
- To study Multirate signal processing fundamentals

UNIT I DISCRETE RANDOM PROCESS


UNIT II SPECTRUM ESTIMATION


UNIT III LINEAR ESTIMATION AND PREDICTION


UNIT IV ADAPTIVE FILTERS

FIR adaptive filters- Newton’ Steepest descent method- Wiener Hoff LMS adaptive algorithm, Adaptive Noise Cancellation, Adaptive channel equalization, Recursive least squares- Exponentially weighted RLS, Sliding Window RLS.

UNIT V MULTIRATE DIGITAL SIGNAL PROCESSING

Interpolation and Decimation – Direct digital domain approach- Decimation by an integer factor- Interpolation by an Integer factor- Single and Multistage realization- Polyphase realization, Application to sub band coding.

TOTAL HOURS: 45

TEXT BOOKS:


REFERENCE BOOKS:
AIM
To learn the architecture and programming of advanced microprocessors.

OBJECTIVES
- To introduce the concepts of advanced microprocessors.
- To introduce the programming techniques using MASM, DOS and BIOS function calls.
- To introduce the basic architecture of Pentium family of processors.
- To introduce the architecture programming and interfacing of advanced Microprocessors.
- To introduce the concepts and architecture of RISC processor.

UNIT I  80186, 80286, 80386 AND 80486 MICROPROCESSORS 9

UNIT II  PENTIUM MICROPROCESSORS 9

UNIT III  RISC PROCESSORS I 9

UNIT IV  RISC PROCESSORS II(Superscalar Processors) 9

UNIT V  PC HARDWARE OVERVIEW 9
Functional Units & Interconnection, New Generation Mother Boards 286 to Pentium 4 Bus Interface- ISA-EISA- VESA- PCI- PCIX. Peripheral Interfaces and Controller, Memory and I/O Port Addresses.

TOTAL HOURS: 45

TEXTBOOKS:
AIM

The purpose of Video Processing course is to cover the fundamentals of digital video signal generation and further processing over the communication systems.

OBJECTIVE

- To learn the basic concepts of video processing
- To learn about the various methodologies for motion estimation
- To learn the basic concepts of coding systems
- To understand about the waveform based video coding techniques
- To understand about the content dependent and scalable video coding techniques

UNIT I  VIDEO FORMATION, PERCEPTION AND REPRESENTATION  9

UNIT II  TWO-DIMENSIONAL MOTION ESTIMATION  9
General Methodologies, Pixel-Based Motion Estimation, Block Matching Algorithm, Mesh-based Motion estimation, Global Motion Estimation, Region Based Motion Estimation, Multi resolution Motion Estimation, Application of Motion Estimation in Video Coding. Feature based Motion Estimation.

UNIT III  FOUNDATIONS OF VIDEO CODING  9
Overview of Coding Systems, Basic Notions in Probability and Information Theory, Information Theory for Source Coding, Binary Encoding, Scalar Quantization , Vector Quantization.

UNIT IV  WAVEFORM-BASED VIDEO CODING  9
Block Based Transform Coding, Predictive Coding, Video Coding Using Temporal Prediction and Transform Coding.

UNIT V  CONTENT DEPENDENT & SCALABLE VIDEO CODING  9
Two Dimensional Shape Coding, Texture coding for Arbitrarily Shaped Regions, Joint Shape & Texture Coding, Region-Based Video Coding, Object-based Video Coding.

Basic Modes of Scalability, Object Based Scalability, Wavelet-transform Based Coding.

TOTAL : 45 PERIODS

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AIM
To expose the concepts of embedded system principles – Operating System – RTOS – Software Development Tools.

OBJECTIVES
To Impart Knowledge on
- Basic operating systems and their structures
- Real Time systems
- RT models and Languages
- RT Kernel
- RTOS Applications

1. REVIEW OF OPERATING SYSTEMS
Basic principles – system calls - files – processes – design and implementation of processes - communication between processes – operating system structures

2. REAL TIME SYSTEMS

3. REAL TIME MODELS AND LANGUAGES

4. REAL TIME KERNEL

5. RTOS APPLICATION DOMAINS
RTOS for Image processing – Embedded RTOS for voice over IP – RTOS for fault tolerant applications – RTOS for control systems

TOTAL HOURS: 45

TEXT BOOKS:
AIM:
To understand different electromagnetic Interference problems occurring in Intersystem and in inter system and their possible mitigation techniques in Electronic design

OBJECTIVE:
- To understand the concepts of EMI Sources
- To learn EMI Measurements
- To learn EMC Standards and regulations
- To learn about EMI Control Methods
- To learn about EMC design and Interconnection Techniques.

UNIT-I Basic Concepts
Definition of EMI and EMC with examples, Classification of EMI/EMC – CE, RE, CS, RS units of parameters, Sources of EMI, EMI Coupling Modes- CM and DM, ESD phenomena and effects, Transient phenomena and suppression.

UNIT-II EMI Measurements
Basic principles of RE, CE, RS and CS measurements EMI measuring instruments- Antennas, LISN, Feed through Capacitor, Current probe, EMC Analyzer ad Detection technique open area site, Shielded anechoic chamber, TEM Cell.

UNIT – III EMC STANDARDS AND REGULATIONS

UNIT-IV EMI CONTROL METHODS AND FIXES
Shielding, Grounding, Bonding, Filtering, EMI gasket, Isolation transformer, Optoisolator.

UNIT-V EMC DESIGN AND INTERCONNECTION TECHNIQUES
Cable routing and Connection, Component Selection and Mounting, PCB design- Trace routing, Impedance Control, decoupling, Zoning and grounding.

TOTAL HOURS: 45

TEXTBOOK:
AIM
To make students to understand the applications of electronics in diagnostic and therapeutic area.

OBJECTIVE
❖ To study the methods of recording bio-potentials
❖ To study how to measure biochemical and various physiological information
❖ To understand the working of units which will help to restore normal functioning
❖ To understand the use of radiation for diagnostic and therapy
❖ To learn about the recent trends in medical field and also the electrical safety in Hospitals

UNIT I ELECTRO-PHYSIOLOGY AND BIO POTENTIAL RECORDING 9
The Cell: the Basic Unit of Life - Molecular Components of Cells, The origin of Biopotentials, biopotential electrodes, biological amplifiers, ECG, EEG, EMG, PCG, EOG, lead systems and recording methods, typical waveforms and signal characteristics.

UNIT II BIO-CHEMICAL AND NON ELECTRICAL PARAMETER MEASUREMENTS 9
pH, PO2, PCO2, PHCO3, Electrophoresis, colorimeter, photometer, Auto analyzer, Blood flow meter, cardiac output, respiratory measurement, Blood pressure, temperature, pulse, Blood cell counters, Oxygen saturation of Blood.

UNIT III ASSIST DEVICES 9
Cardiac pacemakers, DC Debrillators, Dialyser, Artificial heart valves – Artificial Heart, Heart-Lung machine.

UNIT IV PHYSICAL MEDICINE AND BIO-TELEMETRY 9

UNIT V RECENT TRENDS IN MEDICAL INSTRUMENTATION 9
Thermograph, endoscopy unit, Laser in medicine, surgical diathermy, cryogenic application, Electrical safety, Patient Monitoring System

TOTAL HOURS: 45
TEXT BOOKS:

REFERENCE BOOKS:
Aim:

To understand the concepts of Biomedical Signal processing.

Objective:

- To learn about the Basics of signal processing
- To learn about various compression techniques in Biomedical signals
- To learn about the Cardiological signals processing
- To learn about the concepts of Noise canceling.
- To learn about the techniques of neurological signal processing

UNIT-I: Introduction to Signal Processing


UNIT-II: Data Compression Techniques

Lossy and Lossless data reduction Algorithms, ECG data compression using Turning point, AZTEC, CORTES, Huffman coding, vector quantization, DCT transform.

UNIT-III: Cardiological Signal Processing

Pre-processing, QRS Detection Methods, Rhythm analysis, Arrhythmia detection Algorithms, Automated ECG Analysis, ECG Pattern Recognition, Heart rate variability analysis.

UNIT-IV : Adaptive Noise Canceling

Principles of Adaptive Noise Canceling, Adaptive Noise Canceling with the LMS adaptation Algorithm, Noise Canceling Method to Enhance ECG Monitoring, Fetal ECG Monitoring.

UNIT-V: Neurological Signal Processing

Modeling of EEG Signals, Detection of spikes and spindles Detection of Alpha, Beta and Gamma Waves - Auto Regressive (A.R.) modeling of seizure EEG - Sleep Stage analysis - Inverse Filtering - Least squares and polynomial modeling.

TOTAL HOURS : 45

TEXT BOOKS:

3. Biomedical Digital Signal Processing, Willis J.Tompkins, PHI,

REFERENCE BOOKS:
AIM:
To Learn the VLSI Signal Processing Techniques.

OBJECTIVE:
- To study about Iteration Bound and parallel processing
- To study about Retiming and Unfolding
- To study about Systolic Architecture Design
- To study about Scaling and Lattice Filter
- To study about pipelining and power reduction techniques

UNIT-I 9
Introduction to DSP system-Iteration bound, Algorithm for computing Iteration Bound-Loop bound algorithm for computing-Iteration bound-Iteration band of multi rate data- flow graphs-pipelining and parallel processing-pipelining of digital FIR filter

UNIT-II 9
Retiming-Unfolding-critical path-retiming properties of unfolding transformation-algorithmic strength reduction in filters & transforms-Discrete cosine transform & Inverse DCT.

UNIT-III 9
Systolic architecture design-FIR systolic arrays-Systolic design for Space representation containing delays-fast convolution-Pipelined & parallel recursive and adaptive filters.

UNIT-IV 9
Scaling and round off noise-Digital lattice filter structure-Schur Algorithm-Derivation of one multiplier lattice filter-Normalised lattice filter-Bit level arithmetic Architecture-Bit-serial multipliers-Bit-serial filter design and implementation-Redundant arithmetic-Redundant number representation.

UNIT-V 9
Numerical strength reduction-synchronous pipelining and clocking styles-Wave pipelining-Asynchronous pipelining-Low power design-Scaling versus power consumption-Power reduction techniques-Programmable digital signal processors.

TOTAL HOURS: 45

TEXT BOOKS:

REFERENCES:


AIM

To introduce the characteristics of Speech signals and the related time and frequency domain methods for speech analysis and speech enhancement.

OBJECTIVE

- To introduce the basic concepts of speech production
- To develop time and frequency domain techniques for estimating speech parameters
- To introduce a predictive technique for speech compression
- To understand the speech enhancement techniques
- To understand speech recognition, synthesis and speaker identification.

UNIT – I: BASIC CONCEPTS

Discrete time speech signal processing, Speech Communication Pathway, Anatomy & Physiology of speech production, Spectrographic Analysis of speech, Categorization of speech sounds.

UNIT – II: SPEECH SIGNAL ANALYSIS

Time domain Analysis for speech processing – Short time energy and magnitude - short time average zero crossing - Speech vs silence discrimination - Pitch period estimation using autocorrelation - function - Short time Fourier analysis- Definition and properties

UNIT – III: SPEECH CODING

Linear predictive coding - principle - solution of LPC equation - Cholesky decomposition method - Durbin's method - Lattice formulation - Frequency domain interpretation of LPC - LPC Applications – CELP.

UNIT – IV: SPEECH ENHANCEMENT

Preliminaries, Weiner filtering, Enhancement based on Auditory Masking

UNIT – V: SPEECH RECOGNITION

Special features for speaker recognition, Speaker Recognition Algorithm, Non-spectral features in speaker recognition, signal enhancement for mismatched condition

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

AIM
To introduce technologies for multimedia processing, coding, and communications.

OBJECTIVE
◆ To learn about the multimedia components & characteristics.
◆ To understand the various text and image compression techniques.
◆ To understand the various audio & video compression techniques.
◆ To understand basics of IP, CODEC methods
◆ To understand about the various networking concepts and applications

UNIT I MULTIMEDIA COMPONENTS
Introduction - Multimedia skills - Multimedia components and their characteristics - Text, sound, images, graphics, animation, video, hardware.

UNIT II TEXT AND IMAGE COMPRESSION
Compression principles-source encoders and destination encoders-Lossless and Lossy compression-entropy encoding -source encoding -text compression --static Huffman coding dynamic coding --arithmetic coding --Lempel Ziv-welsh Compression-image compression

UNIT III AUDIO AND VIDEO COMPRESSION

UNIT IV MULTIMEDIA SOFTWARE & AUTHORING TOOLS
Text Editing & Word Processing tools, Painting & Drawing tools, 3D Modeling & Animation tools, Image Editing, Sound editing tools, Animation, Video & Digital Movie tools.
Types of Authoring tools-Card & Page Based tools, Icon & Object based tools, Time Based, Cross Platform Tools.

UNIT V MULTIMEDIA NETWORKING
Multimedia networking -Applications-streamed stored and audio-making the best Effort service-protocols for real time interactive Applications-distributing multimedia-beyond best effort service-scheduling and policing Mechanisms-integrated services-differentiated Services-RSVP.

TOTAL HOURS= 45

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AIM
To impart the modeling of RF engineering in the field of communication system

OBJECTIVE
- To understand basics of RF.
- To know the design of RF Filter.
- To study about RF devices.
- To understand the concepts of matching & biasing networks.
- To gain knowledge about the design of RF transistor amplifier.

UNIT I RF BASICS 9
RF Safety (general), Frequency Spectrum Overview, RF Power; Bandwidth, dB, Using dB, Transmitter / Receiver Block Diagram; Block descriptions, Discussion, block diagram within applications, Wireless systems, RFID, ECM

UNIT II RF FILTER DESIGN 9
Basic resonator and filter configurations-special filter realization-filter implementation-coupled filter.

UNIT III ACTIVE RF COMPONENTS 9
RF diodes-bipolar junction transistor –RF field effect transistor-high electron mobility transistors-diode models-transistor models-measurement of active devices-scattering parameter device characterization

UNIT IV MATCHING AND BIASING NETWORKS 9
Impedance matching using discrete components-micro strip line matching networks-amplifier classes of operation and biasing networks

UNIT V RF TRANSISTOR AMPLIFIER DESIGN 9
Characteristics of amplifier-amplifier power relations-stability consideration-constant gain-broadband, high power, and multistage amplifiers, Oscillators and mixers: Basic oscillator model-high frequency oscillator configuration-basic characteristics of mixer.

TOTAL PERIODS: 45

TEXT BOOK
2. http://www.gaddon.co.uk/rfsyllabusaus.html
REFERENCES

AIM:
To understand the principles of Radar and its use in military and civilian environment and to learn about Navigational Aids

OBJECTIVES
- To derive and discuss the Range equation and the nature of detection.
- To apply Doppler principle to radars and hence detect moving targets, cluster, also to understand tracking radars.
- To refresh principles of antennas and propagation as related to radars, also study of transmitters and receivers.
- To understand principles of navigation, in addition to approach and landing aids as related to navigation.
- To understand navigation of ships from shore to shore.

UNIT I  Introduction to Radar  9

UNIT II  MTI and Pulse Doppler Radar  9
Introduction to Doppler and MTI Radar- Delay – Line Cancellers – Staggered Pulse Repetition Frequencies – Doppler Filter Banks – Moving Target Detector – Limitations to MTI Performance – Pulse Doppler Radar-tracking with Radar- Monopulse Tracking – Conical Scan and Sequential Lobing –Limitations to Tracking Accuracy- Comparison of Trackers- Automatic Tracking with Surveillance Radars (ADT)

UNIT III  Detection of Signals in Noise  9

UNIT IV  Radio Direction Finding  9

UNIT V  Navigational Aids  9
TEXT BOOKS:

REFERENCE BOOKS:
AIM

To understand about the basic concepts of various optical networks.

OBJECTIVE

- To understand about the basic optical components
- To understand about architecture of various optical networks
- To understand about the wavelength routing networks
- To understand the concepts of packet switching and access networks
- To understand about the overall design considerations and network managements

NIT I  OPTICAL SYSTEM COMPONENTS

Light propagation in optical fibers – Loss & bandwidth, System limitations, Non-Linear effects; Solitons; Optical Network Components – Couplers, Isolators & Circulators, Multiplexers & Filters, Optical Amplifiers, Switches, Wavelength Converters.

UNIT II  OPTICAL NETWORK ARCHITECTURES

Introduction to Optical Networks; SONET / SDH, MetropolitonArea Networks, Layered Architecture; Broadcast and Select Networks – Topologies for Broadcast Networks, Media-Access Control Protocols, Testbeds for Broadcast & Select WDM; Wavelength Routing Architecture.

UNIT III  WAVELENGTH ROUTING NETWORKS

The optical layer, Node Designs, Optical layer cost tradeoff, Routing and wavelength assignment, Virtual topology design, Wavelength Routing Testbeds, Architectural variations.

UNIT IV  PACKET SWITCHING AND ACCESS NETWORKS


UNIT V  NETWORK DESIGN AND MANAGEMENT

Transmission System Engineering – System model, Power penalty - transmitter, receiver, Optical amplifiers, crosstalk, dispersion; Wavelength stabilization; Overall design considerations; Control and Management – Network management functions, Configuration management, Performance management, Fault management, Optical safety, Service interface.

TOTAL HOURS: 45

TEXT BOOK

REFERENCES

AIM:

To understand the principles of encryption algorithms; conventional and public key cryptography.
To have a detailed knowledge about authentication, application level security mechanisms.

OBJECTIVE:

- To learn about Security trends
- To learn about Data Encryption Standard
- To understand the concepts of public key encryption
- To know the Authentication Applications
- To understand the system level security used

UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


TOTAL HOURS: 45

TEXT BOOKS:

REFERENCES

AIM
To enable the student to become familiar with satellites and satellite services.

OBJECTIVES
- Overview of satellite systems in relation to other terrestrial systems.
- Study of satellite orbits and launching.
- Study of earth segment and space segment components
- Study of satellite access by various users.
- Study of DTH and compression standards.

UNIT I SATELLITE ORBITS

UNIT II SPACE SEGMENT AND SATELLITE LINK DESIGN
Spacecraft Technology- Structure, Primary power, Attitude and Orbit control, Thermal control and Propulsion, communication Payload and supporting subsystems, Telemetry, Tracking and command. Satellite uplink and downlink Analysis and Design, link budget, E/N calculation- performance impairments-system noise, inter modulation and interference, Propagation Characteristics and Frequency considerations- System reliability and design lifetime.

UNIT III SATELLITE ACCESS
Modulation and Multiplexing: Voice, Data, Video, Analog – digital transmission system,
Digital video Broadcast, multiple access: FDMA, TDMA, CDMA, Assignment Methods, Spread Spectrum communication, compression – encryption

UNIT IV EARTH SEGMENT
Earth Station Technology-- Terrestrial Interface, Transmitter and Receiver, Antenna Systems TVRO, MATV, CATV, Test Equipment Measurements on G/T, C/No, EIRP, Antenna Gain.

UNIT V SATELLITE APPLICATIONS
INTELSAT Series, INSAT, VSAT, Mobile satellite services: GSM, GPS, INMARSAT, LEO, MEO, Satellite Navigational System. Direct Broadcast satellites (DBS)- Direct to Home Broadcast (DTH), Digital audio broadcast (DAB) - World space services, Business TV (BTV), GRAMSAT, Specialized services – E –mail, Video conferencing, Internet

TOTAL= 45 PERIODS

TEXT BOOKS:

REFERENCE BOOKS

AIM

To make the student learn fundamentals of Operating Systems, implementation aspects of real time concepts and few applications on RTOS.

OBJECTIVES

- To learn about the scope of Industrial Robots
- To study the Robot arm mechanism
- To learn the control of robot arm manipulators
- To know about Robot sensing and vision
- To learn about Robot Intelligence

UNIT 1    SCOPE OF ROBOTS


UNIT 2   ROBOT ARM KINEMATICS & DYNAMICS

Robot Arm Kinematics: Direct Kinematics Problem, Inverse Kinematics Problem, Robot Arm Dynamics: Lagrange Euler Formulation, Newton Euler Formulation, Generalized De Alemberts Equations of Motions.

UNIT 3  CONTROL OF ROBOT MANIPULATORS

Introduction-Control of Puma Robot Arm, Computed Torque Technique, Near-Minimum-Time Control, Variable Structure Control, Non Linear Decoupled Feedback Control, Resolved Motion Control, Adaptive Control.

4. SENSING & VISION


5. ROBOT INTELLIGENCE AND TASK PLANNING


TOTAL HOURS: 45

TEXT BOOKS

REFERENCES

AIM:

To learn about the Basic concepts and Techniques involved in Grid Computing

OBJECTIVE:

❖ To understand about Parallel and Distributed computing
❖ To learn about Grid Monitoring Architecture
❖ To Know about Grid security and resource Management
❖ To Learn about Data Management and Grid Portals
❖ To learn about Grid Middleware

UNIT I CONCEPTS AND ARCHITECTURE

Introduction-Parallel and Distributed Computing-Cluster Computing-Grid Computing- Anatomy and Physiology of Grid-Review of Web Services-OGSA-WSRF.

UNIT II GRID MONITORING

Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- Grid ICE - JAMM -MDS-Network Weather Service-R-GMA-Other Monitoring Systems- Ganglia and Grid Mon

UNIT III GRID SECURITY AND RESOURCE MANAGEMENT


UNIT IV DATA MANAGEMENT AND GRID PORTALS


UNIT V GRID MIDDLEWARE

List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and GLite - Architecture, Components and Features.

TOTAL HOURS = 45

TEXT BOOK

REFERENCES

AIM

- To understand the basics of Television systems and all the new developments in Television Engineering.

OBJECTIVES

- To study the fundamentals of television systems.
- To study the principles of Monochrome Television Transmitter and Receiver systems.
- To understand the essentials of Colour television.
- To study the various Color Television systems with a greater emphasis on PAL system.
- To study the advanced topics in Television systems and Video Engineering.

UNIT I FUNDAMENTALS OF TELEVISION

Aspect ratio-Image continuity-Number of scanning lines-Interlaced scanning-Picture resolution-Camera tubes-Image Orthicon-Vidicon- Plumbicon- Silicon Diode Array Vidicon- Monochrome picture tubes-Composite video signal- video signal dimension-horizontal sync-vertical sync. Details-Scanning sequence details, Picture signal transmission-positive and negative modulation- VSB transmission- Sound signal transmission-Standard channel bandwidth.

UNIT II MONOCHROME TELEVISION TRANSMITTER AND RECEIVER


UNIT III ESSENTIALS OF COLOUR TELEVISION


UNIT IV COLOUR TELEVISION SYSTEMS

NTSC colour TV systems-SECAM system- PAL colour TV systems-PAL-D Colour system-Chromo signal amplifier-separation of U and V signals-colour burst separation-Discriminator-ACC amplifier-Reference Oscillator-Ident and colour killer circuits-U and V demodulators- Colour signal matrixing, Sound in TV
UNIT V ADVANCED TELEVISION SYSTEMS

Satellite TV technology-Geo Stationary Satellites-Domestic Broadcast System-Cable TV-Cable Signal Sources-Cable Signal Processing & Distribution - Video Disc recording and playback-DVD Players-Tele Text Signal coding and broadcast receiver- Digital television-Digital Terrestrial Television-Projection television-Flat panel display TV receivers-LCD and Plasma screen receivers-3DTV-EDTV-HDTV.

TOTAL HOURS: 45

TEXTBOOKS


REFERENCE BOOKS

AIM

The purpose of this course is to study the basics of remote sensing, atmospheric characteristics, optical & microwave remote sensing, geographic information system.

OBJECTIVE

- To understand the basics & components of remote sensing and types of laws used for remote sensing.
- To know about the atmospheric characteristics & earth surface materials.
- To study the types of Radar, Sensors & Scanners.
- To know the components of GIS & comparison of Raster and Vector data structure.
- To understand the characteristics of Digital Satellite Image and application of Remote Sensing and GIS.

UNIT 1 REMOTE SENSING


UNIT II EMR INTERACTION WITH ATMOSPHERE AND EARTH MATERIALS


UNIT III OPTICAL AND MICROWAVE REMOTE SENSING


UNIT IV GEOGRAPHIC INFORMATION SYSTEM

UNIT V APPLICATIONS


TOTAL HOURS: 45

TEXT BOOKS


REFERENCES

AIM:
This course is offered to students to gain basic knowledge on Nanoelectronics and various fabrication techniques involved in nanoscience.

OBJECTIVE:
- To Know basic concepts in Nanotechnology
- To learn the Fundamental of Nanoelectronics
- To learn the silicon MOSFET and Quantum Transport Devices
- To learn the fabrication of Carbon Nanotubes
- To study about the Molecular Electronics in Nanotechnology

UNIT I INTRODUCTION TO NANOTECHNOLOGY

UNIT II FUNDAMENTALS OF NANOELECTRONICS

UNIT III SILICON MOSFETS & QUANTUM TRANSPORT DEVICES

UNIT IV CARBON NANOTUBES
interconnects – carbon nanotube FETs – Nanotube for memory applications – prospects of all carbon nanotube nanoelectronics.

UNIT V MOLECULAR ELECTRONICS 9

TOTAL HOURS: 45

TEXTBOOKS

REFERENCES:
AIM

To introduce the basic concepts of navigation & communication systems of aircraft.

OBJECTIVE

- To study the basics in avionics system.
- To know the principles of digital system.
- To understand the architecture of digital avionics
- To study the control and display technologies
- To know the utility systems in avionics.

UNIT – I: INTRODUCTION TO AVIONICS 6

Need for Avionics in civil and military aircraft and space systems - Integrated Avionics and Weapon system - Typical avionics sub systems - Design and Technologies.

UNIT – II: PRINCIPLES OF DIGITAL SYSTEMS 10

Digital Computers - Microprocessors – Memories

3. DIGITAL AVIONICS ARCHITECTURE 6

Avionics system architecture-Data buses MIL-STD 1553 B-ARINC 429-ARINC 629.

4. FLIGHT DECK AND COCKPITS 8

Control and display technologies CRT, LED, LCD, EL and plasma panel - Touch screen -Direct voice input (DVI) - Civil cockpit and military cockpit: MFDS, HUD, MFK, HOTAS

5. INTRODUCTION TO AVIONICS SYSTEMS 15


TOTAL HOURS: 45

TEXT BOOKS


REFERENCES

AIM
To examine mathematical and computational fundamentals of artificial neural networks and their applications in signal and image processing, pattern recognition and modelling.

OBJECTIVE
- To understand the fundamentals of artificial neural networks
- To study about the concepts of Bi-directional Associative memories and Back propagation networks.
- To study about the concepts of counter propagation networks
- To study about the concepts of self organizing map and adaptive resonance theory.
- To study the concepts of Neocognitron.

UNIT I: INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS
9

UNIT II: BPN AND BAM
9
Back Propagation Network –BPN operation - updating of output and hidden layer weights -application of BPN, Bi-directional Associative Memory –architecture, processing, mathematics, - Hopfield memory - traveling sales man problem.

UNIT III: SIMULATED ANNEALING AND CPN
9
Annealing: Real and Stimulated,Boltzman machine - learning - application - Counter Propagation network - architecture - training –an image classification example.

UNIT IV: SOM AND ART
9
Self organizing map - learning algorithm - feature map classifier - applications, Adaptive Resonance Theory - pattern matching in ART network-gain control in ART.

UNIT V: NEOCOGNITRON
9

TOTAL HOURS: 45

TEXT BOOK:

REFERENCE BOOK:
AIM:
To appreciate the rights of others

OBJECTIVE:
To Impart Knowledge about
❖ Basic Property types & Introduction to IPR
❖ Patents and procedures
❖ Conventions of IPR
❖ IPR policies and case studies

UNIT I

UNIT II
IP - Patents - Copyrights and related rights - Trade Marks and rights arising from Trademark registration - Definitions - Industrial Designs and Integrated circuits - Protection of Geographical Indications at national and International levels - Application Procedures..

UNIT III

UNIT IV
Indian Position Vs WTO and Strategies - Indian IPR legislations - commitments to WTO-Patent Ordinance and the Bill - Draft of a national Intellectual Property Policy - Present against unfair competition.

UNIT V
Case Studies on - Patents (Basumati rice, turmeric, Neem, etc.) - Copyright and related rights - Trade Marks - Industrial design and Integrated circuits - Geographic indications Protection against unfair competition.

TOTAL HOURS: 45

TEXT BOOK

REFERENCE BOOKS
AIM
To students to gain basic knowledge on MEMS (Micro electro Mechanical System) and various fabrication techniques. This enables them to design, analyze, fabricate and test the MEMS based components.

OBJECTIVES
- Introduction to MEMS and micro fabrication
- To study the Mechanics for MEMS Design.
- To study Electro Static Design and System Issues.
- To know various MEMS Applications
- To know about the optical and RF MEMS

UNIT I      INTRODUCTION TO MEMS
MEMS and Microsystems, Miniaturization, Typical products, Micro sensors, Micro actuation, MEMS with micro actuators, Micro accelerometers and Micro fluidics, MEMS materials, Micro fabrication

UNIT II     MECHANICS FOR MEMS DESIGN
Elasticity, Stress, strain and material properties, Bending of thin plates, Spring configurations, torsional deflection, Mechanical vibration, Resonance, Thermo mechanics – actuators, force and response time, Fracture and thin film mechanics.

UNIT III    ELECTRO STATIC DESIGN AND SYSTEM ISSUES
Electrostatics: basic theory, electro static instability. Surface tension, gap and finger pull up, Electro static actuators, Comb generators, gap closers, rotary motors, inch worms, Electromagnetic actuators. bistable actuators. Electronic Interfaces, Feedback systems, Noise, Circuit and system issues,

UNIT IV   MEMS APPLICATION
Case studies – Capacitive accelerometer, Peizo electric pressure sensor, Microfluidics application, Modeling of MEMS systems, CAD for MEMS.

UNIT V   INTRODUCTION TO OPTICAL AND RF MEMS
Optical MEMS, - System design basics – Gaussian optics, matrix operations, resolution. Case studies, MEMS scanners and retinal scanning display, Digital Micro mirror devices. RF Memes – design basics, case study – Capacitive RF MEMS switch, performance issues.

TOTAL HOURS: 45

TEXT BOOK:

REFERENCE:
AIM

To understand the concepts of Internet and Java Programming

OBJECTIVE

- To study about the basics of Internet and web concepts
- To understand scripting languages and databases
- To introduce object oriented programming concepts and Java
- To understand the concepts of Packages, inheritance and interfaces
- To understand the concepts of Event handling, threads and exception handling

UNIT I

INTRODUCTION TO NETWORK AND WEB CONCEPTS 6

History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, and IMAP.

UNIT II

SCRIPTING LANGUAGES & DATABASE- ASP – XML 12


UNIT III

JAVA INTRODUCTION 6


UNIT IV

PACKAGES , INHERITANCE & INTERFACES 9


UNIT IV

EVENTS , THREADS & EXCEPTIONS 12

TEXT BOOK


REFERENCES

AIM

To introduce the techniques of soft computing and adaptive neuro-fuzzy inferencing systems which differ from conventional AI and computing in terms of its tolerance to imprecision and uncertainty.

OBJECTIVES

- To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience
- To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inferencing systems.
- To provide the mathematical background for carrying out the optimization associated with neural network learning
- To familiarize with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations.
- To introduce case studies utilizing the above and illustrate the intelligent behavior of programs based on soft computing

UNIT I - FUZZY SET THEORY


UNIT II - OPTIMIZATION


UNIT III - NEURAL NETWORKS


UNIT IV - NEURO FUZZY MODELING


UNIT V - APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

TEXT BOOK


REFERENCES

AIM

To study the applications of information science and its impact in medical field

OBJECTIVE

- To understand the hospital management system and integrated hospital information system
- To know about the basic concepts of artificial intelligence and expert systems
- To study the hospital management information systems and computer assisted patient education
- To understand the concept of 3 dimensional imaging and its applications
- To study the concepts of telemedicine, its issues and reliability

UNIT I:

Introduction- Hospital management and information system: functional area- pre-requisites- integrated hospital information systems- health information system- and disaster management plan

UNIT II:

Artificial intelligence- expert systems- materials and methods- computer based patient Records- computer assisted medical education

UNIT III:

Hospital Management and Information systems- structure and functions- computer assisted patient education computer assisted patient surgery

UNIT IV:

Three-dimensional imaging: limitations of endoscopy and imaging- benefits of virtual endoscopy- materials and methods- limitations- applications- merits and demerits- surgical simulation- virtual environment

UNIT V:

Telemedicine- needs- materials and methods- Internet telemedicine- controversial issues- reliability- cost analysis- applications- Telesurgery- the Internet

TOTAL HOURS: 45

TEXT BOOK:


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1. **INTRODUCTION**

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

2. **TQM PRINCIPLES**


3. **STATISTICAL PROCESS CONTROL (SPC)**

The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

4. **TQM TOOLS**

5. QUALITY SYSTEMS


TOTAL HOURS: 45

TEXT BOOK:

REFERENCES:
Unit I:

- Fundamentals of Computer architecture-introduction-organization of a small computer
- Central Processing Unit - Execution cycle – Instruction categories – measure of CPU performance
- Memory – Input/output devices - BUS-addressing modes.
- System Software – Assemblers – Loaders and linkers – Compilers and interpreters

Unit II:

- Problem solving with algorithms- Programming styles –
- Coding Standards and Best practices - Introduction to C Programming
- Testing and Debugging. Code reviews
- System Development Methodologies – Software development Models
- User interface Design – introduction – The process – Elements of UI design & reports.

Unit III:

- RDBMS- data processing – the database technology – data models
- ER modeling concept –notations – Extended ER features
- Logical database design - normalization
- SQL – DDL statements – DML statements – DCL statements
- Writing Simple queries – SQL Tuning techniques – Embedded SQL - OLTP

Unit IV:

- Objected oriented concepts – object oriented programming
- UML Class Diagrams– relationship – Inheritance – Abstract classes – polymorphism
- Object Oriented Design methodology - Common Base class
- Alice Tool – Application of OOC using Alice tool.
Unit V:

- Client server computing - Internetworking – Computer Networks –

Components of web application - browsers and Web Servers

UNIT – I

INTRODUCTION TO BUSINESS INTELLIGENCE


UNIT - II BASICS OF DATA INTEGRATION (Extraction Transformation Loading)


UNIT - III INTRODUCTION TO MULTIDIMENSIONAL DATA MODELING

Introduction to Data and Dimensional Modeling – Multi Dimensional Data Model – ER modeling Vs Multi Dimensional Model – Concepts of Dimensions - facts - cubes- attributes- hierarchies- star and snowflake schema – Introduction to Business Metrics and KPIs – Creating Cubes using SSAS.

UNIT - IV BASICS OF ENTERPRISE REPORTING

Introduction to Enterprise Reporting - Concepts of dashboards - balanced scorecards – Introduction to SSRS Architecture– Enterprise Reporting using SSRS reporting service

UNIT - V BI ROAD AHEAD

BI and Mobility – BI and cloud computing – BI for ERP systems - Benefits of BI in ERP-NorthWind_Traders Data- Data Analyses through Excel-Kettle Tool – Conversion of data using Kettle Tool.

TOTAL : 45

TEXT BOOKS
1. RN Prasad, Seema Acharya, "Fundamentals Of Business Analytics" Wiley India,2011

REFERENCE BOOKS


UNIT I - REVIEW OF DIGITAL INSTRUMENTATION 6
Representation of analog signals in the digital domain – Review of quantization in amplitude and time axes, sample and hold, sampling theorem, ADC and DAC.

UNIT II FUNDAMENTALS OF VIRTUAL INSTRUMENTATION 10

UNIT III CLUSTER OF INSTRUMENTS IN VI SYSTEM 10

UNIT IV APHICAL PROGRAMMING ENVIRONMENT IN VI 10
Concepts of graphical programming – Lab-view software – Concept of VIs and sub VI - Display types – Digital – Analog – Chart – Oscilloscopic types – Loops – Case and sequence structures - Types of data – Arrays – Formulae nodes –Local and global variables – String and file I/O.

UNIT V ANALYSIS TOOLS AND SIMPLE APPLICATIONS IN VI 9

TOTAL HOURS: 45

TEXT BOOKS:

REFERENCE BOOKS:
Unit 1: RL78 Microcontroller Architecture
New generation embedded systems: low power operations, high performance, battery operated embedded systems; Introduction to RL78 microcontrollers; Architecture of RL78 microcontrollers, General purpose registers; Memory space; Flash mirror facility; Boot clusters; Special function registers; Pipeline execution.

Unit 2: RL78 Clock circuitry, Voltage detection and Operating modes.
RL78 clock circuitry and operating modes; Clock management; Operating modes- Standby operating modes; HALT mode; Sub-HALT mode; STOP mode; SNOOZE mode; Reset management; Power-on-reset; Voltage detection circuit; Applying voltage detection circuits.

Unit 3: Instruction set and Fail-safe features of RL78.
Instruction set; Addressing modes; Types of instructions; Types of interrupts; Interrupt sources and configurations, Interrupt priority; Interrupt servicing; Key interrupt functions; Introduction to fail-safe standard IEC60730; Usage of CRC in memory; Detection of abnormal CPU operations.

Unit 4: RL78 peripherals: I/O ports, serial communication functions.
RL78 peripheral functions; I/O Ports; Port architecture; Port operations; Port controlling registers; Serial ports of RL78, Functions of 3-wire serial I/O; Functions of UART channels; Functions of simplified IIC channels; Functions of LIN communications.

Unit 5: Timer array units, Analog to Digital converters, Software development tools of RL78.
Timer array units; PWM output generation; One-shot pulse outputs; Multiple PWM outputs; Interval timers; Real time counters; Watchdog timers; Analog to digital converter overview; A/D conversion operations; A/D conversion modes; Flash memory configurations; Flash memory programming; Software development environment for RL78 microcontrollers.

Reference Books:
1. Embedded systems using Renesas RL78 Microcontrollers – by Alexander Dean and James Conrad.
2. Smart Book on Renesas RL78 Microcontrollers – by M.Balaji.
3. Renesas Knowledge base on RL78 microcontrollers: www.renasas rulz.com