AIM:
To give the exposure to the students on project management, importance of project management and project management tools.

OBJECTIVES:
- To study the basic concepts of project management.
- To acquire knowledge on various project management tools.
- To understand the concepts of project estimation and control.
- To learn application of information systems to project management.

UNIT I PROJECT MANAGEMENT & SYSTEMS AND PROCEDURES

UNIT II NETWORK SCHEDULING & PERT NETWORK

UNIT III PROJECT COST ESTIMATION
Process – classification–expert opinion, analogy, parametric estimate, cost engineering– example: Contingency amount ; Elements of budgets and Estimates – direct labour, direct non– labour, overhead, general and administrative expenses, profit and total billing; Project cost accounting and management information system – cost summaries, cost schedules and forecasts – case study.

UNIT IV PROJECT CONTROL
Cost accounting systems– project control process; Project control emphasis – scope change control, quality control, schedule control, time buffers; Performance Analysis – cost, schedule, work package analysis, performance indices updating time estimates, technical performance measurement; Performance Index monitoring – variance limits, controlling changes, contract administration, control problems, case study.

UNIT V PROJECT MANAGEMENT INFORMATION SYSTEMS (PMIS) & PROJECT EVALUATION
Functions – Computer based PMI Systems – Web–Based project management. Review meetings, reporting, terminating, termination responsibilities, closing the contract, project extensions, project summary evaluation.

REFERENCES :

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BoS Chairman
AIM:
To enhance the knowledge of advanced processing systems and their features.

OBJECTIVES:
- To understand the architecture of processors.
- To study about Pentium processors and data processing.
- To enhance the knowledge of ARM processors and its operating modes with different interfaces.

UNIT I MICROPROCESSOR ARCHITECTURE

UNIT II HIGH PERFORMANCE CISC ARCHITECTURE – PENTIUM

UNIT III PENTIUM PROCESSOR PROGRAMMING

UNIT IV HIGH PERFORMANCE RISC ARCHITECTURE – ARM

UNIT V ARM PROCESSOR PROGRAMMING AND BUS STANDARDS

REFERENCES:

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BoS Chairman
To enhance the knowledge to the students about the VHDL language for designing the digital integrated circuits.

OBJECTIVES:
- To introduce the fundamentals of VHDL.
- To learn about data types and basic modeling constructs.
- To study the concepts of subprograms, packages and files.
- To study about the signals, components and configurations in VHDL program.
- To implement the VHDL program for designing of programmable logic devices.

UNIT I VHDL FUNDAMENTALS
Fundamental concepts – Modeling digital system – Domain and levels of modeling – modeling languages – VHDL modeling concepts – Scalar Data types and operations – constants and Variable –Scalar Types – Type Classification – Attributes and scalar types – expression and operators – Sequential statements.

UNIT II DATA TYPES AND BASIC MODELING CONSTRUCTS

UNIT III SUBPROGRAMS, PACKAGES AND FILES

UNIT IV SIGNALS, COMPONENTS, CONFIGURATIONS

UNIT V DESIGN WITH PROGRAMMABLE LOGIC DEVICES
Realization of – Micro controller CPU – Memories – I/O devices – MAC – design, synthesis, simulation and testing.

REFERENCES:

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BoS Chairman
AIM:
To introduce the student to various image processing techniques.

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

UNIT I DIGITAL IMAGE FUNDAMENTALS
Elements of digital image processing systems, Vidicon and Digital Camera working principles, Elements of visual perception, brightness, contrast, hue, saturation, Mach Band effect, Image sampling, Quantization, Dither, Two dimensional mathematical preliminaries.

UNIT II IMAGE TRANSFORMS
1D DFT, 2D transforms – DFT, DCT, Discrete Sine, Walsh, Hadamard, Slant, Haar, KLT, SVD, Wavelet transform.

UNIT III IMAGE ENHANCEMENT AND RESTORATION

UNIT IV IMAGE SEGMENTATION AND RECOGNITION
Image segmentation – Edge detection, Edge linking and boundary detection, Region growing, Region splitting and Merging, Image Recognition – Patterns and pattern classes, Matching by minimum distance classifier, Matching by correlation, Neural networks – Backpropagation network and training, Neural network to recognize shapes.

UNIT V IMAGE COMPRESSION
Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, Vector Quantization, Block Truncation Coding, Transform coding, JPEG standard, JPEG 2000, EZW, SPIHT, MPEG.

REFERENCES:
AIM:
To provide exposure to the students on various soft computing techniques and their applications in engineering

OBJECTIVES:
- To understand the neural networking concepts and different types of learning.
- To learn the concepts of fuzzy logic system.
- To understand the concepts of genetic algorithm.
- To learn the concepts of optimization techniques and MATLAB toolboxes.
- To build the applications using soft computing techniques.

UNIT I  NEURAL NETWORKS

UNIT II  FUZZY LOGIC

UNIT III  GENETIC ALGORITHM
Genetic algorithm: Basic concept, encoding, fitness function, Reproduction, Basic genetic programming concepts, differences between GA and Traditional optimization methods, Variants of GA, Introduction to Differential Evolution.

UNIT IV  EVOLUTIONARY COMPUTATION
Bio Inspired optimization Techniques: Particle Swarm optimization, Ant colony optimization, Bacteria foraging method.
MATLAB Environment for soft computing: Neural Network toolbox, Fuzzy logic toolbox, GA toolbox.

UNIT V  APPLICATIONS

L: 45, T: 0, Total 45

REFERENCES:

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BoS Chairman
AIM:
To expose the students to the concepts of various power quality problems and its analysis, measurement, monitoring and mitigation techniques.

OBJECTIVES:
- To impart knowledge on categories and characteristics of power system electromagnetic phenomena and various PQ terms.
- To know sources and effects of harmonics and its measurement and mitigation techniques.
- To learn different PQ monitoring techniques and PQ survey.
- To analyze signal processing applications to PQ and custom power devices for PQ enhancement.

UNIT I OVERVIEW OF POWER QUALITY

UNIT II WAVEFORM DISTORTION

UNIT III POWER QUALITY MONITORING

UNIT IV SIGNAL PROCESSING OF PQ DISTURBANCES

UNIT V POWER QUALITY IMPROVEMENT

REFERENCES:

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BoS Chairman
AIM: To know about ASIC design and programming concepts.

OBJECTIVES:
- To understand about CMOS design rules and library architecture.
- To study about programming ASICS clock & power inputs, Xilinx I/O blocks.
- Dealing about Altera Max 5000 and 7000, PLA tools and CFI design representation.
- To understand about programming in verilog & VHDL and their simulation.
- Implementation of ASIC design steps physically.

UNIT I  INTRODUCTION TO ASICs

UNIT II  PROGRAMMABLE ASICs

UNIT III  INTERCONNECTS AND DESIGN TOOLS

UNIT IV  LOGIC SYNTHESIS, SIMULATION AND TESTING

UNIT V  PHYSICAL DESIGN

REFERENCES:

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BoS Chairman
AIM:
To give the exposure to the students on computer networking, different layers and their associated protocols, and interworking concepts.

OBJECTIVES:
- To learn the basic concepts and basic layering of computer networks.
- To know the protocols of the associated layers and their use.
- To understand the concepts of internetworking and relevant protocols.

UNIT I INTRODUCTION

UNIT II PHYSICAL LAYER AND THE MEDIA

UNIT III DATA LINK LAYER

UNIT IV LANS AND WANS


UNIT V INTERNETWORKING

REFERENCES:

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BoS Chairman
AIM:
To understand Virtual Instrument systems concepts and study computer interface system.

OBJECTIVES:
- To understand the concept of virtual instruments and prerequisites for a computer leased instrument systems.
- To illustrate Lab VIEW environment and graphical programming concepts.
- To explore the different Data acquisition hardware and interfaces, configuration and features.

UNIT I  INTRODUCTION
General Functional description of a digital instrument – Block diagram of a Virtual Instrument – Physical quantities and Analog interfaces – Hardware and Software – User interfaces – Advantages of Virtual instruments over conventional instruments – Architecture of a Virtual instrument and its relation to the operating system.

UNIT II  SOFTWARE OVERVIEW

UNIT III  PROGRAMMING STRUCTURE
FOR loops, WHILE loop, CASE structure, formula node, Sequence structures – Arrays and Clusters – Array operations – Bundle – Bundle/Unbundle by name, graphs and charts – String and file I/O – High level and Low level file I/O’s – Attribute modes Local and Global variables.

UNIT IV  HARDWARE ASPECTS
Installing hardware, installing drivers – Configuring the hardware – Addressing the hardware in Lab VIEW – Digital and Analog I/O function – Data Acquisition – Buffered I/O – Real time Data Acquisition.

UNIT V  LABVIEW APPLICATIONS

L: 45, T: 0, Total 45

REFERENCES:

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BoS Chairman
AIM:
To give the exposure to the students on nano electronics, nano computing and their architectures.

OBJECTIVES:
- To learn the basic concepts of nano computing.
- To acquire knowledge on biochemical and quantum-mechanical computers.
- To understand the concepts of parallel architectures and nano electronics.
- To learn about information processing systems.

UNIT I INTRODUCTION

UNIT II BIOCHEMICAL AND QUANTUM-MECHANICAL COMPUTERS

UNIT III PARALLEL ARCHITECTURES FOR NANOSYSTEMS

UNIT IV SOFT COMPUTING AND NANOELECTRONICS

UNIT V NANOSYSTEMS AS INFORMATION PROCESSING MACHINES

L: 45, T: 0, Total 45

REFERENCE:

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BoS Chairman
AIM:
To enhance knowledge in VLSI design and signal processing.

OBJECTIVES:
- To introduce DSP systems, filters & processing.
- To emphasise on retiming, parallel filters.
- To exposure on convolution methods & HR filters.
- To discussion about Bit-level arithmetic architectures, Lyon’s bit serial multipliers.
- To get an idea about sub expression elimination, wave pipelining.

UNIT I  INTRODUCTION TO DSP SYSTEMS, PIPELINING AND PARALLEL PROCESSING OF FIR FILTERS
Introduction to DSP systems – Typical DSP algorithms, Data flow and Dependence graphs – critical path, Loop bound, iteration bound, Longest path matrix algorithm, Pipelining and Parallel processing of FIR filters, Pipelining and Parallel processing for low power.

UNIT II  RETIMING, ALGORITHMIC STRENGTH REDUCTION

UNIT III  FAST CONVOLUTION, PIPELINING AND PARALLEL PROCESSING OF IIR FILTERS

UNIT IV  SCALING, ROUND–OFF NOISE, BIT–LEVEL ARITHMETIC ARCHITECTURES

UNIT V  NUMERICAL STRENGTH REDUCTION, SYNCHRONOUS, WAVE AND ASYNCHRONOUS PIPELINING

REFERENCES:

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BoS Chairman
AIM:
To enhance the knowledge of the students on computer network switching architecture and performance improvement.

OBJECTIVES:
- To learn LAN switching technologies.
- To understand the different switching architectures.
- To know the concepts of IP switching.

UNIT I  LAN SWITCHING TECHNOLOGY  9

UNIT II  ATM SWITCHING ARCHITECTURE  9

UNIT III  QUEUES IN ATM SWITCHES  9

UNIT IV  PACKET SWITCHING ARCHITECTURES  9
Architectures of Internet Switches and Routers – Bufferless and buffered Crossbar switches, Multi–stage switching, Optical Packet switching; Switching fabric on a chip; Internally buffered Crossbars.

UNIT V  IP SWITCHING  9
Addressing model, IP Switching types – flow driven and topology driven solutions, IP over ATM address and next hop resolution, multicasting, IPv6 over ATM.

REFERENCES:

L: 45, T: 0, Total 45

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BoS Chairman
AIM:
To gain knowledge about MEMS design and circuit system issues and their operations.

OBJECTIVES:
- To introduce Microsystems and micro actuators.
- To dealing about material properties and configuration.
- To have an adequate knowledge about basic theory in electronics, electromagnetic actuators.
- To learn about circuit design interfaces and modelling of systems.
- To introduce about system design basics and relative case studies.

UNIT I   INTRODUCTION TO MEMS
MEMS and Microsystems, Miniaturization, Typical products, Micro sensors, Micro actuation, MEMS with micro actuators, Microaccelerometers 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
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.

UNIT IV  CIRCUIT AND SYSTEM ISSUES
Electronic Interfaces, Feedback systems, Noise, Circuit and system issues, Case studies – Capacitive accelerometer, Peizo electric pressure sensor, Modelling 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.

L: 45, T: 0, Total 45

REFERENCES:

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BoS Chairman
AIM:
To gain knowledge about wavelet transform, CWT, DWT and their applications.

OBJECTIVES:
- To introduce vector spaces and their properties.
- To have an adequate knowledge in Fourier analysis.
- To learn continuous wavelet transform, discrete wavelet transform and their applications.

UNIT I  INTRODUCTION

UNIT II  FOURIER ANALYSIS

UNIT III  CONTINUOUS WAVELET TRANSFORM
Wavelet transform – properties – concept of scale and its relation with frequency – Continuous Wavelet Transform (CWT) – scaling function and wavelet functions: Daubechies, Haar, Coiflet, Mexican hat, Sine, Gaussian, Bi–orthogonal – Tilling of time scale plane for CWT.

UNIT IV  DISCRETE WAVELET TRANSFORM

UNIT V  CASE STUDIES
Sub–band coding of images – Image compression – Image denoising – Detection of sag, tilt, swells and surge in power signal – Fractal signal analysis

L: 45, T: 0, Total 45

REFERENCES:

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BoS Chairman
AIM:
To learn about power dissipation, optimization & estimation in low power VLSI design techniques.

OBJECTIVES:
- To learn source of power consumption and basic principle of low power design.
- To deal about circuit techniques for reducing power consumption.
- To emphasis on layout design, advanced techniques, and special techniques.
- To analysis of power estimation and power analysis techniques.
- To exposure on software design for low power.

UNIT I  POWER DISSIPATION IN CMOS
Hierarchy of limits of power – Sources of power consumption – Physics of power dissipation in CMOS FET devices – Basic principle of low power design.

UNIT II  POWER OPTIMIZATION
Logical level power optimization – Circuit level low power design – Circuit techniques for reducing power consumption in adders and multipliers.

UNIT III  DESIGN OF LOW POWER CMOS CIRCUITS
Computer Arithmetic techniques for low power systems – Reducing power consumption in memories – Low power clock, Interconnect and layout design – Advanced techniques – Special techniques.

UNIT IV  POWER ESTIMATION
Power estimation techniques – Logic level power estimation – Simulation power analysis – Probabilistic power analysis.

UNIT V  SYNTHESIS AND SOFTWARE DESIGN FOR LOW POWER
Synthesis for low power –Behavioral level transforms– Software design for low power.

REFERENCES:

L: 45, T: 0, Total 45

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BoS Chairman
AIM:
To give the exposure to the students on the concepts of interworking, multimedia and relevant protocols, and applications.

OBJECTIVES:
- To study the basic concepts of multimedia networking.
- To learn about multicast and transport protocol.
- To understand the concepts of multimedia servers.
- To know the applications of multimedia and interworking.

UNIT I MULTIMEDIA NETWORKING
Digital sound, video and graphics, basic multimedia networking, multimedia characteristics, evolution of Internet services model, network requirements for audio/video transform, multimedia coding and compression for text, image, audio and video.

UNIT II BROAD BAND NETWORK TECHNOLOGY
Broadband services, ATM and IP, IPV6, High speed switching, resource reservation, Buffer management, traffic shaping, caching, scheduling and policing, throughput, delay and jitter performance.

UNIT III MULTICAST AND TRANSPORT PROTOCOL
Multicast over share media network, multicast routing and addressing, scaping multicast and NBMA networks, Reliable transport protocols, TCP adaptation algorithm, RTP, RTCP.

UNIT IV MEDIA – ON – DEMAND
Storage and media servers, voice and video over IP, MPEG over ATM/IP, indexing synchronization of requests, recording and remote control.

UNIT V APPLICATIONS
MIME, Peer-to-peer computing, shared application, video conferencing, centralized and distributed conference control, distributed virtual reality, light weight session philosophy.

REFERENCES:

L: 45, T: 0, Total 45

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BoS Chairman
AIM:
To give the exposure to the students on algorithm design techniques and basic problem types.

OBJECTIVES:
- To learn the fundamentals of algorithm design concepts.
- To understand the basics of different algorithm design techniques.
- To know the concepts of different sorting and searching techniques and their complexities.
- To study the graph algorithms and advanced concepts in algorithm designing.

UNIT I INTRODUCTION

UNIT II DIVIDE AND CONQUER METHOD AND GREEDY METHOD

UNIT III DYNAMIC PROGRAMMING

UNIT IV BACKTRACKING AND BRANCH AND BOUND

UNIT V NP–HARD AND NP–COMPLETE PROBLEMS

REFERENCES:

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BoS Chairman
AIM:
To study the context of planning and development, that the significance of research lies in its quality.

OBJECTIVES:
- To enable researchers, in developing the most appropriate methodology for their research studies.
- To make the researchers familiar with the art of using different research methods and techniques.
- To study the different methods of data collection, measurement and scaling techniques.
- To understand the several parametric tests of hypotheses.
- To study the analysis of data and the art of writing research reports.

UNIT I  INTRODUCTION AND DATA COLLECTION
Research methodology – definition, mathematical tools for analysis, Types of research, exploratory research, conclusive research, modelling research, algorithmic research, Research process – steps.
Data collection methods – Primary data – observation method, personal interview, telephonic interview, mail survey, questionnaire design – Secondary data – internal sources of data, external sources of data.

UNIT II  SCALES AND SAMPLING
Scales – measurement, Types of scale – Thurstone’s Case V scale model, Osgood’s Semantic Differential scale, Likert scale, Q– sort scale. Sampling methods– Probability sampling methods – simple random sampling with replacement, simple random sampling without replacement, stratified sampling, cluster sampling. Non–probability sampling method – convenience sampling, judgment sampling, quota sampling.

UNIT III  HYPOTHESES TESTING–I (PARAMETRIC TESTS)
Hypotheses testing – Testing of hypotheses concerning means (one mean and difference between two means – one tailed and two tailed tests), concerning variance – one tailed Chi–square test.

UNIT IV  HYPOTHESES TESTING–II (NONPARAMETRIC TESTS)

UNIT V  DATA ANALYSIS AND REPORT PREPARATION
Introduction to Discriminant analysis, Factor analysis, cluster analysis, multidimensional scaling, conjoint analysis. Report writing – Types of report, guidelines to review report, typing instructions, oral presentation.
L: 45, T: 0, Total 45

REFERENCES:

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BoS Chairman
AIM:
The aim of this course is to build up a familiarity with the perceptually-salient aspects of the audio signal, and how they can be extracted and manipulated through signal processing.

OBJECTIVES:
- To provide comprehension on the foundations of speech processing.
- To obtain a thorough understanding of the statistical pattern recognition technology at the core of contemporary speech and audio processing systems.
- To deepen student's familiarity with the acoustics and auditory perception.
- To obtain an understanding of the speech & audio recognition systems and speech features.
- To provide basics for the designing of voice coders in different applications.

UNIT I  INTRODUCTION

UNIT II  PATTERN CLASSIFICATION

UNIT III  ACOUSTICS AND AUDITORY PERCEPTION

UNIT IV  SPEECH FEATURES AND AUTOMATIC SPEECH RECOGNITION
Speech Features: Auditory system as a filter bank, cepstrum as a spectrum analyzer, linear prediction – Automation speech recognition: Feature extraction for ASR, linguistic categories for speech recognition, speech recognition and understanding.

UNIT V  SYNTHESIS AND CODING
Parametric source – filter synthesis, concatenative methods – Pitch detection – Vocoder – low, medium and high rate Vocoder

REFERENCES:

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BoS Chairman