BACHELOR OF TECHNOLOGY

IN

INFORMATION TECHNOLOGY- Admission 2004

THIRD SEMESTER

EN04 301B Engineering Mathematics Iii	
Module No : 1	
Module I: Linear Algebra (13 hours) Vector spaces –Linear dependence and independence, and their computation – Bases and dimension – Subspaces – Inner product spaces – Gram-Schmidt orthogonalisation process – Linear transformations – Elementary properties of Linear transformations – Matrix of a linear transformation. (Proofs of theorems are not required)	
Books :	
References :	
Module No : 2	
Module II: Fourier Integrals and Fourier transforms (13 hours) Fourier integral (proof not required) – Fourier sine and cosine integral representations – Fourier sine and cosine transforms – Properties of Fourier transforms – Singularity functions and their Fourier transforms.	
Books :	
References :	
Module No : 3	
Module III: Complex Analytic Functions (13 hours) Function of a complex variable – Derivative-Analytic function – Canchy-Riemen equations – Laplaces equation – conformal mapping – Exponential function – Trigonometric functions – Hyperbolic functions – Logarithm – Linear fractional transformations.	
Books :	
References :	
Module No : 4	
Module IV: Complex Integrals (13 hours) Line integral in the complex plane – Cauchy's integral theorem (Proof of existence of indefinite integral to be omitted) – Cauchy's integral	

formula – Derivatives of an analytic functions (Proof to be omitted) – Taylor series – Laurent series –Singularities and zeros – Residue integration method – Evaluation of real integrals.

Books :

References :

IT04 302 Data Structures And Algorithms

Module No : 1

Module - I: (12 hours) Review of data types – scalar types – primitive types –enumerated types –sub ranges structures types – character strings – arrays - records – sets - tiles – data abstractions - complexity of algorithms – time and space complexity of algorithms using "big oh" notation – recursion: recursive algorithms – analysis of recursive algorithms.

Books :

References :

Module No : 2

Module - II: (12 hours) Linear data structures – stacks – queues –lists – stack and queue implementation using array – linked list – linked list implementation using pointers.

Books :

References :

Module No : 3

Module - III: (12 hours) Non linear structures: graphs – trees – sets – graph and tree implementation using array linked list – set implementation using bit string, linked list.

Books :

References :

Module No : 4

Module – IV: (16 hours) Searching – sequential search –searching arrays and linked lists – binary search – searching arrays and binary search trees – hashing – introduction to simple hash functions – resolution of collisions - sorting: n2 sorts – bubble sort – intension sort - selection sort – NlogN sorts – quick sort – heap sort – merge sort – external sort – merge files

Books :

References :

IT 04 303 Discrete Computational Structures

Module No : 1

Module – I: (13 hours) Logic – logical connectives and Truth tables – Logical equivalence and laws of logic – logical implication and rules of inference – Quantifiers – Proofs of theorems using rules of universal specification and universal generalization.

Books :

References :

Module No : 2

Module – II: (13 hours) Relational Structures – Cartesian products –Relations – Relation matrices –Properties of relations – Composition of relations – Equivalence relations and partitions – functions – One-to-one, on to functions – Composition of functions and inverse functions – partial orders – Hasse diagrams

Books :

References :

Module No : 3

Module – III: (13 hours) Group theory – Definition and elementary properties – Cyclic groups – Homomorphism and Isomorphisms- Subgroups – Cosets and Lagrange's theorem – Elements of coding theory – Hamming metric - Generator matrices – Group codes – Hamming matrices.

Books :

References :

Module No : 4

Module – IV: (13 hours) Rings and Fields –Definitions and examples of rings, integral domains and fields – Elementary properties and substructures – Homomorphisms and Isomorphisms – The ring Zn – Polynomial rings – Irreducible polynomials and finite fields.

Books :

References :

IT 04 304 Basic Electronics Engineering

Module No : 1

Module – I: (15 hours) Electronic components – concepts of voltage and current sources – Energy bands in solids, metals insulators and semiconductors –Intrinsic and extrinsic semiconductors – PN junction theory – V-I characteristics - diode resistance – rectifiers – Performance analysis of rectifiers – Filters, Zener, varator and power diodes – LEDs. Transistors – Working and amplifying action – characteristics – Comparison between CE, CB and CC configurations – CE Amplifier, construction of transistors - Use of data sheet – Thermal runaway – UJT, introduction to FETs.

Books :

References :

Module No : 2

Module – II: (12 hours) Transistor biasting – Selection of operating point – Bias stabilization – Different biasting circuits – PNP biasting – Small signal amplifiers – single stage amplifier – Graphical Method – Equivalent circuit method – Amplifier analysis FET amplifier - Multistage amplifiers – Gain analysis – RC coupled amplifier – Frequency response – Two stage RC coupled amplifier – Distortation in amplifiers - Classification of amplifiers

Books :

References :

Module No : 3

Module – III: (13 hours) Power amplifiers – Single-ended power amplifier - harmonic distortation – Push-pull amplifier – Tuned voltage amplifier – Resonance- Single tuned voltage amplifier - Feedback in amplifiers – Types of feedback – Voltage gain with feedback – Negative feedback – Oscillators – Classification – LC oscillators – RC Oscillators – Crystal oscillators – Astable multivibrator

Books :

References :

Module No : 4

Module – IV: (12 hours) Operational amplifiers – Inverting and non- Inverting amplifiers – Adder – Voltage follower – Differential amplifier – Integrator and Differentiator – Zero-crossing detector – Precision diode - Peak detector – Logarithmic amplifier – Square and triangle wave generator – Analog computation –Active filters.

Books :

References :

IT04 305 Switching Theory & Logic Design

Module No : 1 :

Module – I: (14 hours) Number Systems and codes – Boolean algebra – Postulates and theorems – Constants, Variables and functions – Switching algebra – Electronic gates and Mechanical contacts Boolean functions and logical operations – Normal and canonical forms – self-dual functions – Logical operations – Karnaugh map – Prime cubes – Minimum sum of products and product of sums – Quine – McClusky algorithm

Books :

References :

Module No : 2

Module – II: (13 hours) Combinational Logic – Analysis and Design of combinational logic circuits – Universal property of the NAND and NOR gates – Adders –Parallel adders and look-ahead adders – Comparators – Decoders and encoders – Code conversion – Multiplexers and demultiplexers – Parity generators and checkers – ROMs PLAs

Books :

References :

Module No : 3

Module – III: (10 hours) Fault diagnosis and tolerance – Fault classes and models-Fault diagnosis and testing – Test generation –Fault table method – Path sensitizations method – Boolean difference method – Fault-tolerance techniques. Programmable logic arrays – PLA minimization – Essential prime cube theorem - PLA folding – Design for testability.

Books :

References :

Module No : 4

Module – IV: (15 hours) Counters and shift registers – SR, JK, D and T flip-flops – Excitations tables – Triggering of flip-flops – Flip-flop applications – Latches – Ripple counters – Synchronous counters – Up-down counters –Design of sequential circuits - Counter decoding – Counter applications – Shift registers and their applications – Clock mode sequential machine – State tables and diagrams.

Books :

References :

IT 04 306 Technical Argumentation

Module No : 1

Module – I: (13 hours) Introduction to argument – choice of topic – defining audience – defining terms – planning argument – avoiding logical fallacies – case study of classic arguments of Mahatma Gandhi, Martin Luther King Jr.

Books :

References :

Module No : 2

Module – II: (13 hours) Understanding forms of persuasion – Reading critically – Plagirism – documenting sources – guide to research – avoiding selective research – case study involving issue of surfing the web.

Books :

References :

Module No : 3

Module – III: (13 hours) Searching for magazine, journal, newspaper articles – using abstracting services, Internet, books, other library resources – case study involving culture and curriculam

Books :

References :

Module No : 4

Module – IV: (13 hours) Conducting interviews, surveys, compiling bibliography – organizing, writing and preparing researched paper – case study involving gun control and immigration – case study of select classic argument of Plato.

Books :

References :

IT 04 307(P) Programing Lab

Module No : 1

Set – I: (3 lab sessions) HCF (Euclid's algorithm) and LCM of given numbers – Find mean – median and mode of a given set of numbers – Conversion of numbers from binary to decimal, hexadecimal, octal and back – Evaluation of functions like ex, Sin x, cos x, etc. for a given numerical precision using Taylor's series – Testing whether a given number is prime. Set – II: (2 lab sessions) String manipulation programs: sub-string search, deletion – Lexicographic sorting of a given set of strings – Generation of all permutations of the letters of a given string using recursion. Set – III: (2 lab sessions) Matrix operations: Programs to find the product of two matrices – Inverse and determinant (using recursion) of given matrix – Solution to simultaneous linear equations using Jordan elimination. Set – IV: (2 lab sessions) Files: Text files – use of sequential files for storing records with provision for insertion – deletion, search, sort and update of a record. Implementation of random access files of records. Set – V: (2 lab sessions) Usage of program development & maintenance tools (for example. "make") - Examples of accessing operating system environment from within program, conditional assembly – Exercises involving standard I/O devices, argc, argv functions – Exercises demonstrating a few system calls. Note: Make utility May used extensively to do the programming for this set of experiments.

Books :

References :

IT04 308(P) Digital Electronics Lab

Module No : 1	
Objective: This course gives hand on experience on digital electronics components and systems; which are fundamental building blocks of the Computer systems. Experiments are structured to cover extensively the characteristic and features of indispensable digital electronic circuits and systems 1.Verification of truth tables of AND, OR, NOT, NAND, NOR and XOR gates, use for gating digital signals 2.TTL characteristics 3.Verification of the postulates of Boolean algebra and DeMorgan's theorem using logic gates. 4.Half and full adders, half and full substractors. 5.Digital comparator, parity generator and checker, and code converter. 6.Characteristics and operations of RS, gated RS, D,T and JK master slave flipflops. 7.Multiplexer and demultiplexer using gates 8.Shift register, ring counter, and twisted ring counter. 9.Decade counter and variable modulo asynchronous counter 10.Astable multivibrator and Schmitt trigger using gates, astable and monostable multivibrator and frequency divider using 555	
Books :	
References :	

FOURTH SEMESTER

EN04 401 B Engineering Mathematics Iv		
Module No : 1		
Module I: Probability and Distributions (16 hours) Introduction –Probability distributions continuous random variables –Probability density functions – Mathematical expectation – The Expected value of arandom variable –Moments –Moment generating function- Special probability distributions –Binomial distribution-Geometric distributions-Hyper geometric distribution-Poisson distribution-Special probability densities-Uniform density –Gamma nad Chi-square distributions-Normal distribution.		
Books :		
References :		
Module No : 2		
Module II: Sampling Distributions & Estimation (10 hours) Population and samples-The sampling distribution of the mean- The sampling distribution of the variance Estimation-Introduction-Unbiased estimators-Efficiency-Consistency-Sufficiency-The method of maximum likehood-Interval estimations- the estimation of means-The estimation of Variances.		
Books :		
References :		
Module No : 3		

Module III: Testing Hypothesis (10 hours) Tests of hypothesis-Null hypotheses and tests of hypotheses and tests of hypotheses – Hypotheses concerning one mean-Hypotheses concerning two means – hypothesis concerning one variance - Hypotheses concerning two variances –chi-square test for goodness of fit.

Books :

References :

Module No : 4

Module IV:Jointly distributed random variables, Markov chains & Poisson process (16 hours) Joint distribution functions-Independent random variables-Covariance and variance of sums of random variables-Joint probability distribution of functions of random variables- Joint probability distribution of functions of random variables-Stochastic process-Conditional probability and conditional expectations. Markov chains-Champman Kolmogorov equations-Exponential distribution-Properties of exponential distribution-Counting process-Definition of Poisson process-Interval and waiting time distributions.

Books :

References :

EN04 402 Environmental Studies

Module No : 1

Module I: (12 hours) The Multi disciplinary nature of environmental studies Definition – scope and importance –need for public awareness. Natural Resources Renewable and non-renewable resources: Natural resources and associated problems – forest resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their defects on forests and tribal people. – Water resources: Use and over – utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. – Food resources: World food problems, changes caused by agriculture overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: Growing energy needs, renewable energy sources, use of alternate energy sources, case studies – Land resources: Land as a resource, land degradation, man induced land slides, soil crosion and desertification – Role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyle.

Books :

References :

Module No : 2

Module II: (14 hours) Ecosystems – Concept of an ecosystem –Structure of an ecosystems – Producers, consumers, and decomposers- Energy flow in the ecosystem- Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features. Structure and functions of the following ecosystem: - forest ecosystem – Grassland ecosystem- Desert ecosystem –Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and its conservation Introduction –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 wild life, man-wildlife conflicts – Endangered and endemic species of India –Conservation of Biodiversity: In-situ and Ex-situ conservation of biodiversity.

Books :

References :

Module No : 3

Module III: (11 hours) Environmental Pollution Definition – Causes, effects and control measures of: - Air pollution –Water pollution –Soil pollution- Machine pollution- Noise pollution- Thermal pollution –Nuclear hazards – Solid waste Management: Cause, 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 –Environmental Protection Act – air (Prevention and Control of Pollution) Act- Water (Prevention and control of Pollution) Act – wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation- Public Awareness.

Books :

References :

Module No : 4

Module IV: (10 hours) Social Issues and the Environment From unsustainable to sustainable development –Urban problems related to energy – Water conservation, rain water harvesting, watershed management- Resettlement and rehabilitation of people: its problems and concerns, case studies – environmental Ethics: Issues and possible solutions-Climate change, global, warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies – Wasteland reclamation – Consumerism and waste products. Human Population and the environment Population growth, variation among nations – Population explosion – family welfare programme – Environment and human health – Pollution hazards, sanitation and health – Human rights for clean environment-Value Education-HIV/AIDS-social concern-Women and Child Welfare-Role of information Technology in Environmental and human health-case studies.

Books :

References :

IT04 403 System Programming

Module No : 1

Module – I: (15 hours) Background – System software machine architecture –the simplified instructional computer – traditional machines –RISC machines –assemblers – bascic assembler functions- machine dependent and machine independent –assembler features-assembler designs - assembler design options – implementation examples- AIX Assembler.

Books :

References :

Module No : 2

Module – II: (13 hours) Loaders and linkers – basic loader functions – machine dependent and machine independent loader features- loader design options and implementation examples- macro processors- basic macro processor functions – machine-independent macro processor features – macro processor design options and implementations examples.

Books :

References :

Module No : 3

Module – III: (15 hours) Introduction to operating systems – basic principles – batch processing – multiprogramming- time sharing systems and real-time systems – parallel and distributed systems – computer system structure – computer system operation –I/O structure – structure –storage hierarchy – hardware protection – general system architecture – operating system structure –system components - OS services – system calls –system structure – virtual machines.

Books :

References :

Module No : 4	Module Name :

Module – IV: (9 hours) General overview of the UNIX operating system – history of UNIX – system structure – user perspective –services – hardware assumptions – unix Architecture – system concepts – kernel data structures – system administration process (concepts only)

Books :

References :

IT04 404 Micro Processor Based Design

Module No : 1

Module – I: (13 hours) Historical background of microprocessors – inside the PC – motherboard – graphic adapters and monitors – drive controllers – floppy and hard disk drives – streams and other drives - parallel interfaces and printers- serial interfaces and modems – network adapters and LANs – CMOS RAM and real clock – keyboard, mouse and other rodents – the power supply – operating system – BIOS and memory organization – 8086/8088 hardware specification: clock generator-bus buffering and latching-bus timing-ready and wait states- minimum and maximum modes-advanced processors- features of 80386,80486 and Pentium processors

Books :

References :

Module No : 2

Module – II: (14hours) Microprocessors architecture: real mode and protected mode memory addressing-memory paging-addressing modes-data addressing-program memory addressing-stack memory addressing-data movement instructions-arithmetic and logic instruction-program control instructions-programming the microprocessors: modular programming –using keyboard and display-data conversion- disk file- interrupt hooks

Books :

References :

Module No : 3

Module – III: (13 hours) Memory interface-memory devices- address decoding,8bit (8088),16bit(8086),32bit (80486) and 64 bit(Pentium) memory interfaces-dynamic RAM.I/O interface-port address decoding-PPI,8279 interface-8254 timer interface-16550 UART interface-ADC /DAC interface

Books :

References :

Module No : 4

Module – IV: (14 Hours) Interrupts –interrupt processing –hardware interrupts – expanding the interrupt – 8259A programmable interrupt controller –DMA: DMA operation – 8237 DMA controller –shared bus operation– disk memory systems – video displays – bus interface: ISA bus –EISA and VESA buses –PCI bus

Books :

References :

IT04 405 Programing Paradigms

Module No : 1

Module – I: (15 hours) Introduction: Role of programming languages – higher level languages – programming paradigms – language implementation on a machine – Language Syntax description –notations for expressions, abstract syntax trees, lexical syntax, context free grammars, variants of grammars– Language Semantic description – introduction to synthesized attributes, attributed grammar, natural semantics, denotational semantics. Imperative programming: Introduction – structured programming – Constructs for structured control flow – syntactic concerns – handling special cases in loops – Discussion based on C. Role of types –Basic types – compound types like arrays, records, union and variant records, sets – Pointers and dynamic allocation – types and error checking – Discussion based on C. Introduction to procedures – parameter passing methods – scope rules -, nested scopes- implementation- discussion based on C.

Books :

References :

Module No : 2

Module – II: (12 hours) Object oriented programming: Introduction – Grouping of data and

operations- Constructs for program structuring – Information hiding – Program design with modules – Modules and defined types – Illustration based on C++ on class declaration, dynamic allocation, templates, objects. Definition of object – Object oriented thinking – Inheritance – Derived classes and information hiding – Illustration based on C++.

Books :

References :

Module No : 3

Module – III: (12 hours) Functional programming: Introduction - Elements of functional programming – Types: values and operations – Function declaration – approaches to expression evaluation – Lexical scope – Type checking. Functional programming with lists-introduction to schemes- Structures of lists – List manipulation – Simplification of expression – storage allocation for lists.

Books :

References :

Module No : 4

Module – IV: (13 hours) Logic programming: Introduction – Computing with relations – Introduction to Prolog – Data structures – Programming techniques – controlling prolog – Cuts. Concurrent programming: Parallelism in hardware – Implicit Synchronization – Interleaving – Liveness properties – Safe access to shared data – Synchronized access to shared variables.

Books :

References :

IT04 406 Communication Systems

Module No : 1

Module – I: (14 hours) Noise in communication systems – Classification – SNR – CNR – Noise figure –Relationship between noise figures – Voice signal digitization – PAM – pTM – PWM – PCM – Delta modulation – PCM & DM voice signal comparison – TDM of PCM signals – CCITT – Digital radio – Block diagram – ASK – FSK –PSK – QAM – Digital demodulation – QAM demodulation.

Books :

References :

Module No : 2

Module – II: (12 hours) Line of sight microwave links – Analog line of sight microwave links – Digital line of sight microwave links – Communication satellite – Classification – Communication satellite systems – Orbits – Planetary mechanics – Launching – Stabilization –Subsystems and repeaters – Satellite Earth station – antenna subsystems - Transmitter – Receiver.

Books :
References :

Module No : 3

Module – III: (13 Hours) Fibre optic communications – nature of light – Optical Laws – Optical fibres – Optical sources – Photo detections – Optical communication system – System parameters – Analog optical fibre links – Digital optical fibre systems.

Books :
References :

Module No : 4

Module – IV: (13 hours) Satellite access – FDM access –TDM access – Satellite links – Satellite link analysis and design – Digital satellite link design – System measurements – Fourier series – The Z – transform – Modulator/demodulator sensitivity measurements – digital microwave link measurements and performance evaluation – high definition TV – System specifications.

Books :
References :

IT04 406 Communication Systems

Module No : 1

Module – I: (14 hours) Noise in communication systems – Classification – SNR – CNR – Noise figure –Relationship between noise figures – Voice signal digitization – PAM – pTM – PWM – PCM – Delta modulation – PCM & DM voice signal comparison – TDM of PCM signals – CCITT – Digital radio – Block diagram – ASK – FSK –PSK – QAM – Digital demodulation – QAM demodulation.

Books :
References :

Module No : 2

Module – II: (12 hours) Line of sight microwave links – Analog line of sight microwave links – Digital line of sight microwave links – Communication satellite – Classification – Communication satellite systems – Orbits – Planetary mechanics – Launching – Stabilization –Subsystems and repeaters – Satellite Earth station – antenna subsystems - Transmitter – Receiver.

Books :
References :

Module No : 3

Module – III: (13 Hours) Fibre optic communications – nature of light – Optical Laws – Optical fibres – Optical sources – Photo detections – Optical communication system – System parameters – Analog optical fibre links – Digital optical fibre systems.

Books :

References :

Module No : 4

Module – IV: (13 hours) Satellite access – FDM access –TDM access – Satellite links – Satellite link analysis and design – Digital satellite link design – System measurements – Fourier series – The Z – transform – Modulator/demodulator sensitivity measurements – digital microwave link measurements and performance evaluation – high definition TV – System specifications.

Books :

References :

IT04 407(P) Data Structure Lab

Module No : 1

1.Stack Queue: Implementation using arrays and linked lists 2.Searching methods: Binary search and hashing 3.Sorting: Recursive implementation of quick sort and merge sort 4.Binary Search Tree: Implementation with insertion, deletion, traversal 5.Infix expression evaluation: Using expressions tree. 6.Graphs search Algorithms: DFS & BFS on a connected directed graph. 7.Minimal Spanning Tree: Implementations of Kruskal's and Prim's Algorithms 8.Shortest path Algorithms: Dijkstra and Floyd Warshall algorithms 9.Disjoint set operations: Union and find using rank and path compression 10.Applications of Heap: Priority queue and heap sort

Books :

References :

IT04 408(P) Programing Environments Lab

Module No : 1

1.Familiarization with features of an editor (for example Vi, Emacs) 2.Shell programming, usage of tools like grep, awk etc… 3.Usage of Program development & maintenance tools (for example "make") 4.Usage of debugging tools (for example "gdb") 5.Familiarization with scripting languages (for example Perl, Tcl/Tk) 6.Usage of lexical processing tools (for example Lex) 7.Introduction to document formats (for example HTML, PDF). Scripting and generation of dynamic pages. Scripting languages and interaction 8.Introduction to the tools providing GUI based human computer interaction (for example Qt.). Automatic generation of code for interaction using visual programming (for example Qt Designer)

9.Introduction to tools for preparing documents (for example Word/Latex)
Books :
References :

FIFTH SEMESTER

IT04 501 Software Engineering
Module No : 1
Module – I: (11 hours) Introduction: Definition - History - Software life cycle - Software Engineering & other areas of computer science - Nature of a software product - Representative qualities - Quality requirements in different application areas - Idea of quality assurance. Software Engineering principles - Illustrative case studies.
Books :
References :
Module No : 2
Module – II: (14 hours) Design: Relation of software engineering principles to design - Design activity & its objectives - Modularization techniques - module structure and its representation, interface and information hiding, categories, specific techniques to accommodate change, stepwise refinement, top-down and bottom-up design - Handling anomalies. Concurrent software - methods to keep consistency - Real time software - Distributed software - issues in building modules, module integration - Object oriented design. Architecture: Standard - Components - Architecture for component integration - Architecture for distributed systems. Specification: The different contexts - Typical uses - Different styles - Verification of specification. Operational specification notations - Definition with example for DFD, UML, Finite state machines - Descriptive specification notations - Definition with example of E-R diagrams, logic specification, algebraic specification - Building & using specifications in practice.
Books :
References :
Module No : 3
Module – III: (15 hours) Verification: Goals and requirements of verification - Approaches to verification. Testing - Goals for testing - Theoretical foundations - Empirical testing principle - White box testing, black box testing - Top-down & bottom-up integration - Testing object oriented programs - Separate concerns in testing activity - Testing concurrent & real time systems. Analysis - Informal techniques - Basic concepts of correctness proof - Using correctness proof in practice - Symbolic execution - Basic concepts - Model checking. Verifying other software properties - Metrics for verifying qualities. Production Process: Software Process Model - Importance - Main activities in software production - feasibility study, specifying requirements, detailed design, testing, system testing, delivery & maintenance, other related activities. Process models - Waterfall model, Evolutionary

model, Transformational model, Spiral model - An assessment of process models - Dealing with Legacy software - Case study: A telephone switching system - Case study: Synchronize & stabilize process - Case Study: Open source approach. Configuration management - Software standards.

Books :

References :

Module No : 4

Module – IV: (12 hours) Management: Functions - Project planning - Software productivity - Productivity metrics - Factors affecting productivity - Cost estimation - Predictive models - COCOMO & COCOMO II - Project control - Work breakdown structures, Gantt charts, PERT charts - Dealing with deviations - Team organization - centralized, de-centralized, mixed - An assessment of team organizations - Risk management - Capability maturity model. Tools & Environments: Evolution - Dimensions for comparing tools - Representative tools - Tools for software testing - Static analyzers - GUI tools - Configuration management tools - Tracking tools - Reverse and re-engineering tools - Management tools - Tool integration - Evolution of tools. Future - Role of the software engineer - Ethics and social responsibility.

Books :

References :

IT04 502 Digital Data Communication

Module No : 1

Module – I: (13 hours) Data communication networks - standards - ISO reference model - internal architecture - protocol implementation issues - transmission media - attenuation and distortion - limited bandwidth - signal types -propagation delay - public carrier circuits - modulation - multiplexing - physical layer interfacing standards

Books :

References :

Module No : 2

Module – II: (14 hours) Data transmission basics - transmission modes - asynchronous and synchronous transmission - bit - character and frame synchronization - coding - error detection methods - parity - block sum check - cyclic redundancy check - data compression - Huffman coding - dynamic Huffman coding - facsimile compression - transmission control circuits - communication control devices

Books :

References :

Module No : 3

Module – III: (12 hours) Protocol basics - error control - stop-and-wait & sliding window protocol - link utilization - selective repeat and go-back-N - link management

Books :

References :

Module No : 4

Module – IV: (13 hours) Data link control protocols - character-oriented protocols - half-duplex protocols - duplex protocols - bit- oriented protocols - high level data link control (HDLC) - LAPB - LAPD - logical link control - protocol operation

Books :

References :

IT04 503 Operating Systems

Module No : 1

Module – I: (12 hours) Review of operating system strategies - resources - processes - threads - objects - operating system organization - design factors - functions and implementation considerations - devices - characteristics - controllers - drivers - device management - approaches - buffering - device drivers - typical scenarios such as serial communications - storage devices etc

Books :

References :

Module No : 2

Module – II: (12 hours) Process management - system view - process address space - process and resource abstraction - process hierarchy - scheduling mechanisms - various strategies - synchronization - interacting & coordinating processes - semaphores - deadlock - prevention - avoidance - detection and recovery

Books :

References :

Module No : 3

Module – III: (12 hours) Memory management - issues - memory allocation - dynamic relocation - various management strategies - virtual memory - paging - issues and algorithms - segmentation - typical implementations of paging & segmentation systems
Module – IV: (16 hours)

Books :

References :

Module No : 4

Module – IV: (16 hours) File management - files - implementations - storage abstractions - memory mapped files - directories and their implementation - protection and security - policy and mechanism - authentication - authorization - case study of unix kernel and microsoft windows NT (concepts only)

Books :

References :

IT04 504 Information Theory And Coding

Module No : 1

Module – I: (14 hours) Information theory - information and entropy - properties of entropy of a binary memory less source - extension of a discrete memory less source - source coding theorem - Shannon-Fano coding - Huffman coding - Lempel Ziv coding - discrete memory less source - binary symmetric channel - mutual information - properties - channel capacity - channel coding theorem - information capacity theorem

Books :

References :

Module No : 2

Module – II: (14 hours) Coding - linear block codes - generator matrices - parity check matrices - encoder - syndrome and error detection - minimum distance - error correction and error detection capabilities - cyclic codes - coding and decoding

Books :

References :

Module No : 3

Module – III: (14 hours) Introduction to algebra - groups - fields - binary field arithmetic - construction of galois field - basic properties - computations - vector spaces - matrices - BCH codes - description - decoding - reed solomon codes

Books :

References :

Module No : 4

Module – IV: (10 hours) Coding - convolutional codes - encoder - generator matrix - transform domain representation - state diagram - distance properties - maximum likelihood decoding - Viterbi decoding - sequential decoding - interleaved convolutional codes

Books :

References :

IT04 505 Graph Theory & Combinatorics

Module No : 1

Module – I: (13 hours) Introduction to graphs - definitions - subgraphs - paths and cycles - matrix representation of graphs - euler tours - chinese postman problem - planar graphs - Euler's formula - platonic bodies - applications of Kuratowski's theorem - hamiltonian graphs - graph colouring and chromatic polynomials - map colouring

Books :

References :

Module No : 2

Module – II: (14 hours) Trees - definitions and properties - rooted trees - trees and sorting - weighted trees and prefix codes - biconnected components and articulation points - Kruskal's and Prim's algorithms for minimal spanning trees - Dijkstra's shortest path algorithm - bellman-ford algorithm - all-pairs shortest paths - Floyed-Warshall algorithm - the max-flow min-cut theorem - maximum bipartite matching

Books :

References :

Module No : 3

Module – III: (11 hours) Fundamental principles of counting - permutations and combinations - binomial theorem - combinations with repetition - combinatorial numbers - principle of inclusion and exclusion - derangements - arrangements with forbidden positions

Books :

References :

Module No : 4

Module – IV: (14 hours) Generating functions - partitions of integers - the exponential generating function - the summation operator - recurrence relations - first order and second order - nonhomogeneous recurrence relations - method of generating functions Text book

Books :

References :

IT04 506 Data Modeling & Design

Module No : 1

Module – I: (10 hours) Overview of object oriented systems - objects - attributes - encapsulation - class hierarchy - polymorphism - inheritance - messages - history of object orientation

Books :

References :

Module No : 2

Module – II: (14 hours) UML - classes - attributes - and operations - class diagrams - generalizations and association constructs - composition and aggregation - collaboration diagrams - sequence diagrams - asynchronous messages and concurrent execution - state diagrams - nested states - concurrent states and synchronization - transient states - architecture and interface diagrams packages - deployment diagrams for hardware artifacts and software constructs - window-layout and window- navigation diagrams

Books :

References :

Module No : 3

Module – III: (14 hours) Encapsulation structure - connascence - domains of object classes - encumbrance - class cohesion - state spaces and behaviour of classes and subclasses - class invariants - preconditions and post conditions - class versus type - principle of type conformance - principle of closed behaviour - case studies

Books :

References :

Module No : 4

Module – IV: (14 hours) Abuses of inheritance - danger of polymorphism - mix-in classes - rings of operations - class cohesion and support of states and behaviour - components and objects - design of a component - lightweight and heavy weight components - advantages and disadvantages of using components - case studies

Books :

References :

IT04 507(P) Programmig Paradigms Lab

Module No : 1

This laboratory is intended to supplement the theory on paradigms of programming. This additionally serves as introduction to various programming languages representative of each paradigm. It is assumed that students will take extra hours to learn on their own the languages of their choice. The syllabus is prepared in a free format so that an institute offering this course can suitably adapt this with type of platforms / facilities available with them. The thrust is in teaching the paradigms; not the platforms. However, adequate knowledge about platform is a need for successful experimentation. It is hoped that students get enough information in selecting a particular paradigm suitable to the problem in hand. Lab -1 : (object-oriented programming in - Java /C+ +) - Programs to bring out concepts of classes and objects - for example the abstract data type binary tree Lab – 2 : (object oriented

programming) Programs to demonstrate inheritance and class hierarchy - for example define a base class "shape" and derived classes for rectangle, square, ellipse, circle with proper class hierarchy Lab – 3 : (object oriented programming) - Programs to demonstrate polymorphism, virtual functions - for example define base class for vectors and use inheritance to define complex and real vector with standard operations Lab – 4 : (functional programming - in Lisp / scheme / Haskell) - Program to demonstrate functional specification for a solution - for example implementation of quick sort Lab – 5 : (functional programming) - Program to demonstrate implementation of conventional data structures - for example implementation of binary search tree with insertion, deletion, and search operations Lab -6 : (functional programming) - Program to demonstrate use of available data structures in functional programming languages - for example implementation of set with membership, union, and intersection operations Lab – 7 : (logic programming - in prolog / VisiCalc) - Program to demonstrate ready implementation of propositional logic statements - for example implementation of logic program to find the gcd of two given integers Lab – 8 : (logic programming) - Program to demonstrate language specific features - for example implement a logic program to check whether a given NFA accepts the given string Lab – 9 : (concurrent programming - Java / Ada) Demonstration of concurrency support - for example program to find the least common ancestor of two given nodes in a binary tree may be implemented. Lab – 10 : (concurrent programming) - Demonstration of synchronized concurrency - for example program for the readers and writers problem may be implemented.

Books :

References :

IT04 508(P) Hardware Lab

Module No : 1

Objective: This course is to understand the relevance and characteristics of hardware and operating system components of a digital computer system through various laboratory experiments. It also gives the students the ability to interface devices to computer systems through various interfacing techniques. Lab – 1 : Identification of components/cards and PC assembling from components Lab – 2 : Assembly language program for implementing arithmetic operations Lab - 3,4 : Implementation of a file manager using DOS/BIOS interrupts Lab – 5 : TSR (Terminate and Stay Resident) Programming Lab – 6 : ADC interface Lab - 7 : Stepper Motor interface using DAC Lab - 8,9 : Parallel Interface: Printer and HEX keyboard. Lab – 10 : Serial Interface: PC to PC serial interface using MODEM.

Books :

References :

SIXTH SEMESTER

IT04 601 Embedded Systems

Module No : 1

Module – I: (10 hours) Introduction: Definition - Classification - Processors in the system - Other h/w units. Software components - Typical applications - Embedded systems on a chip(SoC) and use of VLSI circuits.

Books :

References :

Module No : 2

Module – II: (12 hours) Hardware organization: Structured units of a processor - Processor selection factors. Common memory devices - Memory selection - Memory map - Internal devices & I/O devices map - Direct memory access - Interfacing the above. Types of I/O devices - Serial devices - Parallel port devices - Sophisticated features - Timer and Counting devices - Advanced serial bus & I/O - High speed Buses - Common types - Advanced Buses.

Books :

References :

Module No : 3   :

Module – III: (15 hours) Programming: Compiling, cross-compiling - Optimized use of memory - Use of DFG for program analysis - Control Data Flow graph - Use of finite state machines model - Use of Petrinet models - Use of Petri table for Real time programming - Issues in multiprocessor systems. Real time programming issues during software development process - Distinction between functions, ISR and tasks - Problems of sharing data in RTOS - Interprocess communication in RTOS. Device drivers - Parallel port driver - Driver for internal programmable timing devices - Interrupt servicing mechanism - Context and periods for context switching - Deadline and Interrupt latency.

Books :

References :

Module No : 4

Module – IV: (15 hours) Real Time Operating Systems: Typical OS structure - RTOS structure - The context of its use - Schedule management for multiple tasks - Scheduling in real time - Interrupt routines in RTOS environment - RTOS task scheduling models - List of basic actions in pre-emptive scheduler and expected time taken - Strategy for synchronization - Discussion using Linux - OS securities issues - Mobile OS. Case study of RTOS using MUCOS. Case study for RTOS based programming - Coding for Automatic Chocolate vending machine using MUCOS.

Books :

References :

IT04 602 Data Base Management Systems

Module No : 1

Module – I: (12 hours) Introduction: characteristics of database approach - advantages of using DBMS - database concept and architecture - data models - schemes - instances - data independence - database languages and interfaces - database modeling using entity - relationship (ER) - entity sets attributes and keys - relationships - type role and structural constraints - weak entity types - enhanced entity-relationship (EER) and object modeling - sub classes - super classes and inheritance - specialization and generalization - modeling of union types

Books :

References :

Module No : 2

Module – II: (10 hours) File organization and storage: secondary storage devices - RAID technology - operations in files - heap files and sorted files - hashing techniques - types of single level ordered index, multi-level indexes - B - trees and B + trees - indexes on multiple keys - other types of indexes

Books :

References :

Module No : 3   design

Module – III: (14 hours) Database design: functional dependencies - normal forms - general definition of second and third normal forms - Boyce-Codd normal form - multi valued dependencies and fourth normal form - join dependencies and fifth normal form - inclusion dependencies - practical database design tuning - database design process relational model concepts - relational algebra operations - queries in SQL - insert - delete and update statements in SQL views in SQL

Books :

References :

Module No : 4

Module – IV: (16 hours) Transaction processing: desirable properties of transactions, schedules and recoverability - serializability of schedules concurrency control - locking techniques - time stamp ordering multi version concurrency control - granularity of data items - database recovery techniques based on deferred up data and immediate updating - shadow pages - ARIES recovery algorithm - database security and authorization - security issue access control based on granting/revoking of privileges introduction to statistical database security

Books :

References :

IT04 603 Computer Networks

Module No : 1

Module – I: (13 hours) Local Area Networks – Project 802 - Ethernet – Token Bus – Token ring - FDDI, Wireless LANs, Wireless media, Transmission schemes, Medium access control, Switching – circuit switching – packet switching (Data gram & Virtual circuit) – Message switching, Connection oriented & Connectionless services.

Books :

References :

Module No : 2

Module – II: (14 hours) ISDN – services - history – subscriber access - ISDN layers, Broadband ISDN, X.25 – layers – PLP packets – Information packet – Control Packet, Frame relay – layers – operation – implementation, ATM – design goals – topology – protocol architecture, SONET/SDH - layers – frames – multiplexing STS frames.

Books :

References :

Module No : 3

Module – III: (13 hours) Networking devices – Bridges – Routers – Gateways, Routing algorithms – distance vector – link state, Transport layer – duties – connection – OSI transport protocol, Upper OSI layers – session layer – presentation layer – application layer.

Books :

References :

Module No : 4

Module – IV: (14 hours) Overview of TCP/IP, Network layer – IP – ARP – RARP – ICMP – IGMP, Transport layer – UDP – TCP, Application layer – DNS - TELNET – FTP – Electronic Mail – SNMP – HTTP, World Wide Web – URL – browser architecture – WWW documents.

Books :

References :

IT04 604 Computer Architecture

Module No : 1

Module – I: (15 hours) Fundamentals: task of a computer designer - trends in technology usage and cost - performance measurement - quantitative principles of computer design - instruction set architectures - classification - addressing and operations - encoding an instruction set - role of compilers - case study: the DLX architecture - pipelining - pipeline for DLX - pipeline hazards - data and control hazards - implementation difficulties -

pipelining with multicycle operations

Books :

References :

Module No : 2

Module – II: (12 hours) Instruction level parallelism: concepts and challenges - dynamic scheduling - dynamic hardware prediction - multiple issue of instructions - compiler and hardware support for ILP - vector processing - vector architecture - vector length and stride - compiler vectorization - enhancing vector performance

Books :

References :

Module No : 3

Module – III: (13 hours) Memory hierarchy design - reducing cache misses and miss penalty, reducing hit time - main memory - virtual memory and its protection - case study - protection in the intel pentium - crosscutting issues - I/O systems - performance measures - reliability and availability - designing an I/O system - case study - unix file system performance

Books :

References :

Module No : 4

Module – IV: (12 hours) Interconnection networks - simple networks - connecting more than two computers - practical issues - multiprocessors - introduction - application domains - centralised-shared memory and distributed-shared memory architectures - synchronization - models of memory consistency

Books :

References :

<div align="center">

IT04 605 Human Computer Interaction

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Module No : 1

Module – I: (14 hours) Foundations: Introduction to model human processor - Input-output channel - Human memory - Thinking - Emotion - Difference between individuals - Psychology and the design of interactive systems. Typical Computer - Text entry devices - Positioning, pointing and drawing - Display devices - Devices for virtual reality & 3D interaction - Physical controls, sensors & special devices - Printing & scanning - Memory - Processing & networks. Introduction to interaction - Model - Frameworks & HCI - Ergonomics - Interactive styles - Elements of WIMP interface - Interaction & its context - Experience and engagement - Paradigms for interaction.

Books :

References :

Module No : 2

Module – II: (15 hours) Design Process: Introduction to interaction design - Process of design - User focus - Scenarios - Navigational design - Screen design & layout - Prototyping. HCI software process - Usability engineerinModule – II: (15 hours) Design Process: Introduction to interaction design - Process of design - User focus - Scenarios - Navigational design - Screen design & layout - Prototyping. HCI software process - Usability engineering - Software prototyping & techniques - Principles to support usability - Standards - Golden rules sample - Rule learning from HCI patterns - Implementation - Elements of windowing systems - Programming - Using toolkits - User interface management systems. Evaluation - Expert analysis - Evaluate through user participation - Choosing an evaluation method. Universal design principles - Multi-modal interaction - Design for diversity - Approaches to user support - Adaptive help systems. g - Software prototyping & techniques - Principles to support usability - Standards - Golden rules sample - Rule learning from HCI patterns - Implementation - Elements of windowing systems - Programming - Using toolkits - User interface management systems. Evaluation - Expert analysis - Evaluate through user participation - Choosing an evaluation method. Universal design principles - Multi-modal interaction - Design for diversity - Approaches to user support - Adaptive help systems.

Books :

References :

Module No : 3

Module – III: (12 hours) Models & theories: Cognitive models - Linguistic model - Physical & device model - Socio-organizational issues - Communication and collaboration model - Uses of task analysis. Dialog notation & design - Diagrammatic notation - Textual dialog notation - Dialog analysis and design.

Books :

References :

Module No : 4

Module – IV: (11 hours) GroupWare systems - Computer mediated communication - Meeting & discussion support systems - Shared applications and artifacts - Framework for GroupWare. Ubiquitous computing & realities - Ubiquitous computing applications research - Virtual and augmented reality - Information and data visualization.

Books :

References :

IT04 606 Information Retrieval

Module No : 1	Introduction

Module - I: (10 hours) Introduction: Information versus Data Retrieval, IR: Past, present, and future. Basic concepts: The retrieval process, logical view of documents. Modeling: A

Taxonomy of IR models, ad-hoc retrieval and filtering. Classic IR models: Set theoretic, algebraic, probabilistic IR models, models for browsing.

Books :

References :

Module No : 2

Module – II: (12 hours) Retrieval evaluation: Performance evaluation of IR: Recall and Precision, other measures, Reference Collections, such as TREC, CACM, and ISI data sets. Query Languages: keyword based queries, single word queries, context queries, Boolean Queries, Query protocols, query operations.

Books :

References :

Module No : 3

Module – III: (12 hours) Text and Multimedia Languages and properties, Metadata, Text formats, Markup languages, Multimedia data formats, Text Operations. Indexing and searching: Inverted files, Suffix trees, Suffix arrays, signature files, sequential searching, Pattern matching.

Books :

References :

Module No : 4

Module – IV: (16 hours) Multimedia IR: Spatial access methods, Generic multimedia Indexing approach, Distance functions, feature extraction, Image features and distance functions. Searching the Web: Characterizing and measuring the Web. Search Engines: Centralized and Distributed architectures, user Interfaces, Ranking, Crawling the Web, Web directories, Dynamic search and Software Agents.

Books :

References :

IT04 607(P) Systems Lab

Module No : 1

Objective: This course is useful to understand the operating system (OS) structures and the implementation aspects of various OS functions and schedulers. The data base problems are incorporated to familiarize problems connected with Data Base designs. Operating systems 1.Implementation of dining philosophers problem by multiprogramming using threads, semaphores and shared memory 2.Implement ls/dir command of Unix/Dos to display contents of a given floppy disk 3.Program to generate disk usage status report for a given Unix/Dos formatted floppy disk giving details like free space availability etc 4.Implement banker's algorithm 5.Inter-process communication using mailboxes and pipes Database

management systems 1.Conversion of a given relational scheme to 3NF and BCNF 2.Implementation of B tree and B+ tree 3.Implement a database stored in an RDBMS accessible through a web browser 4.Program to convert SQL subset into relational algebra (tools like YACC may be used.) 5.Implement optimistic concurrency control algorithm

Books :

References :

IT04 608(P) Mini Project

Module No : 1

Objectives The mini project is aimed at improving the professional competency by touching the areas which otherwise is not covered in theory classes or laboratories – There is a greater realization of importance of the application of ideas to build a solution in complementing the learning process – Result of this exercise may be a completely deployable product with documentation made by following practice in Software Engineering – It is recommended to have connection between mini project and final year project – A report is to be submitted and students will be evaluated in groups and individually. Type of project Students may be given an introduction to problems related to industry and level of current research. They may be given idea about the state of technology in India and abroad and about typical killer applications to understand the implications of a product(computing solution). Then each student is assigned to a project. Two approaches are possible 1.To ask the students to select their work from already prepared list of works (prepared by a competitive person and revised from time to time) 2.To ask the students to select a relevant work which is approved by an approving authority. 3. In any case, the work selected may include the use of as many as possible from the following list. OS platforms: Relevant to the current state, with support for networked environment, for distributed computing, for development of multi-platform applications. For example latest GNU Linux with supporting packages. Internet technologies : XML, Scripting languages like Perl / Python, Middleware(Component) technologies, Architectural concepts like RMI / CORBA Front end / GUI: Code development (XWINDOWS in GNU Linux) or development based on tools(Qt designer, Jbuilder etc…) RDBMS/Back end: Relevant to current state, with database connectivity to different platforms. For example MySQL or PostgreSQL Languages: Qt, Glade or any similar 4GLs, scripting languages and C & C++ in GNU Linux (under GNU gcc) Universal n/w applications development platforms: JAVA, GNU .NET or any similar platform Unix internals : Device drivers, RPC, Threads, Socket programming Embedded systems: RTOS, Embedded hardware with software for an application, Code optimization, security etc… The project may be related to one of the following application areas: Financial / Manufacturing / Multimedia / Instructional design / DBMS / Networking or communication software development / Internet-intranet applications / TCP-IP programming / Protocol study / Operating systems / Distributed systems Projects like development of payroll, inventory, library system or any similar system and use of old packages like dbase III plus should not be entertained. Development based on "Office suite" is also not recommended; for example, use of Visual Basic front end and MS-Access backend for development should not be entertained. Format of report A format may be designed and enforced at each institution - formats must be available in all current OS platforms and students must be asked to use a specific document preparation

systems recommended by each institution - they may be asked to provide the report in electronic form also - this electronic form, made available in CD, will contain the entire project document besides multi-media illustration material prepared using any presentation software. Guidelines for conduct and evaluation: A committee may be constituted for conduct and co-ordination of mini project related activities. The committee is responsible for developing schedules for various activities and keeping them. The functioning of a committee is over only after the final evaluation of the project. Project may be allotted to a student or groups of size at the most four. Each student may be asked to select a guide and then finalize a topic following the guidelines given above. After finalizing the topic, students should submit a Project proposal to the guide. The project work can start only after the approval of the report by guide. The institution has to offer infrastructure recommended by guide till the completion of the project work. In case of non-approval, the suggestions for reformulating the project will be communicated to the students. The revised proposal may be submitted again to guide in a different time slot. Sufficient number of chances may be given; the guide may device a time schedule to accommodate this revision process looking into the available time frame for the project. The project may be an in-house project or an external project. In any case, the student is associated with a guide. The guide must be competent in terms of academic qualifications and experience in the selected area. A list of guides available for a term may be published by the committee mentioned above. The project proposal should be prepared in consultation with guide. It states clearly the project objective and the environment of the proposed project to be undertaken. The following details may be included in it: 1.Title of the project 2.Objective of the project 3.Project category. 4.Information pertaining to analysis and design 5.Tools / Platforms, Hardware and software requirement specification. Students are supposed to go through initial software engineering activities related to the selected problem and may convince the guide about the genuineness of attempt. The proposal need be formed only after this. The proposal may be at the most ten pages in size. The committee mentioned above should do an assessment of the project work at the end of the semester. The students, with the approval of guide, must submit a project report on the work done. Besides, they will make a presentation followed by demonstration before the committee for the evaluation purpose. The assessment is made individually and in groups. The pattern for awarding marks will be as follows: 1.Attendance : 5 marks 2.Work in design and way of presentation evaluated by committee : 30 marks 3.Report and individual assessment by guide : 15 marks Total = 50 marks For external projects, the attendance may be evaluated based on proof for attendance provided by a competent authority of the external agency. In addition, the technical report may contain a certificate from competent authority of the external agency as proof for originality of work done by the student at their premise.

Books :

References :

SEVENTH SEMESTER

IT04 701 Industrial Management & Economics
Module No : 1

Module – I: (13 Hours) 1. Introductory Background – Nature and scope of Economics, Science, Engineering and Technology, their relationship with economic development. 2. Basic Economic Concepts – Wants and utility, Demand and supply, Elasticity of demand and supply, concept of cost and revenue, concept of equilibrium and margin, wealth and capital. 3. Money and Banking – Functions of money – Functions of banks – Commercial and Central Banks, Monetary policy of the Reserve Bank of India.

Books :

References :

Module No : 2

Module – II: (13 Hours) 4. Industrialization and Economic Planning in India – Need for industrialization, Development of Indian Industry since independence, Role of public sector in India, Industrial Policy of the Government of India, A brief study of Five Year Plans of India. 5. Agriculture – Role of Agriculture in Indian Economy – Problems of Indian Agriculture – Green Revolution in Indian Features and effects. 6. Foreign exchange and International Trade – Determination of rate of exchange – Balance of payments and Trade – India's Foreign Trade Policy – A short note on International Monetary Fund (I.M.F.).

Books :

References :

Module No : 3

PART B: PRINCIPLES OF MANAGEMENT Objective An elementary level exposure of management principles relevant for industrial sector. Module – III: (13 hours) Need for management – principles of management – management functions – span of control – delegation – directing – leadership and motivation (basic concepts only) Theories of scientific management (an overview only expected) - Fredric Taylor's theory – Frank Gilbreth's theory – Henry Foyal's theory – present concepts of management. Financial management – objectives and functions – time value of money (numerical examples included) – basics of financial accounting (problem solving not required) – profit and loss account – balance sheet (only introduction) – sources of industrial finance– shares – debentures – public deposits – bank loans – financial institutions.

Books :

References :

Module No : 4

Module – IV: (13 hours) Marketing management –concept of market and marketing – marketing mix – market research – advertising and sales promotion, Scope and objective of Human Resource Management – manpower recruitment analysis– recruitment and training – job analysis – job evaluation – wages and incentives. Decision making – Introduction and definition – techniques of decision making – decision making process – under certainty - uncertainty and risk (problems not included), Network analysis – CPM and PERT (analysis of simple networks).

Books :

References :

S

IT04 702 Cryptoraphy & Network Security

Module No : 1	**Module Name :**

Module – I: (14 hours) Congruence equations : properties - complete and reduced residue systems - Fermat's theorem - Euler function. Indeterminate equations - linear and second degree diophantine equations - congruences in one unknown - congruences of higher degree with prime and composite modulo - Wilson's theorem - quadratic residues.Introduction to cryptography - attacks - services and mechanisms - security attacks – security services –Conventional encryption - classical techniques - model - steganography – classical encryption techniques Modern techniques - DES - cryptanalysis - block cipher principles and design - Algorithms - triple DES - IDEA - blowfish Confidentiality - placement of encryption function - traffic confidentiality - key distribution - random number generation.

Books :

References :

Module No : 2	**Module Name :**

Module - II: (14 hours) Public key encryption - RSA algorithm - key management and exchange. RSA Design and implementation- Chinese Remainder theorem, Garner's formula, RSA Model definition, Digital signatures and public Exponents, Public Key, RSA Key generating functions, Pitfalls in using RSA ,RSA encryption function, Signature functions. Key NegotiationProtocol- Key setting, Authentication convention, Views of the protocol, Attacker's view, Key compromise, complexity and optimization. Implementation issues- Large integer issues, checking DH computations and RSA encryption, faster multiplication, Elliptic curve cryptography - message authentication - requirements - functions and codes - hash functions - security of hash functions and MACs algorithms - MD5 message digest algorithm , Secure Hash (SHA-1) algorithm

Books :

References :

Module No : 3	**Module Name :**

Module - III: (14 hours) Digital signature algorithm – DSA Decription -DSA prime generation-Security of DSA-GOST Digital Signature Algorithm-ONG-Schnorr-Shamir, ESIGN, - Identification schemes- Feige- Fiat-Shamir and its simplified form ,enhancements – Guillou-Quisquater schemes, - Schnorr schemes – Key-exchange Algorithms, Diffie-Hellman scheme and modifications- Encrypted Key exchange(EKE),- Conference Key Distribution and secret Broadcasting – Multiple-Key Public-Key cryptography, Secret-Sharing Algorithms, Subliminal Channel ,Undeniable Digital Signatures-Computing with encrypted data, Fair Coin Flips- Fair and Failsafe Cryptosystems ,Blind Signatures- Probabilistic Encryption- Quantum Cryptography

Books :

References :

Module No : 4	Module Name :

Module- IV: (10 hours) Kerberos- Model, working principle, key servers, Sesame-Common Cryptographic Architecture(CCA),ISO Authentication framework, Privacy-Enhanced Mail(PEM), Pretty Good Privacy(PGP), Public-Key Cryptography Standards(PKCS). IP Security - Architecture, Authentication Header, Encapsulating security payload, Combining security associations ,Key-management,- ISAKMP- Internet Protocol security WEB Security-Socket layer and Transport layer security, Secure Electronic transaction , password selection strategies ,Intrusion detection.

Books :

References :

IT04 703 Distributed Systems

Module No : 1

Module – I: (10 hours) Operating system fundamentals - distributed system concepts and architectures - major design issues - distributed computing environments (DCE)

Books :

References :

Module No : 2

Module – II: (13 hours) Concurrent processes and programming - threads and processes - client server model - time services language mechanisms for synchronization - concurrent programming languages

Books :

References :

Module No : 3

Module – III: (13 hours) Interprocess communication and coordination - message passing communication - request/reply communication - transaction communication - name and directory services - distributed mutual exclusion - leader election

Books :

References :

Module No : 4

Module – IV: (16 hours) Distributed process scheduling - static process scheduling, dynamic load sharing and balancing - distributed process implementation - real-time scheduling - concepts of distributed file systems - distributed shared memory - distributed computer security

Books :

References :

IT04 704 Computer Graphics &Multimedia Systems

Module No : 1

Module – I: (14 hours) Introduction to computer graphics - basic raster graphics algorithms for drawing 2D primitives - scan converting lines - circles - generating characters - geometrical transformations - 2D transformations - homogeneous coordinates and matrix representation of transformations - window-to-viewport transformation - input devices and interactive techniques - interaction hardware - basic interaction tasks - 3D graphics - viewing in 3D - projections - basics of solid modeling - 3D transformation

Books :

References :

Module No : 2

Module – II: (12 hours) Introduction to multimedia - media and data streams - properties of a multimedia system - data stream characteristics - information units - multimedia hardware - platforms - memory and storage devices - input and output devices - communication devices - multimedia software - multimedia software tools - multimedia authoring tools

Books :

References :

Module No : 3

Module – III: (13 hours) Multimedia building blocks - audio - basic sound concepts - music - speech - MIDI versus digital audio - audio file formats - sound for the web - images and graphics - basic concepts - computer image processing - video and animation - basic concepts - animation techniques - animation for the web - multimedia building blocks - audio - basic sound concepts - music - speech - MIDI versus digital audio - audio file formats - sound for the web - images and graphics - basic concepts - computer image processing - video and animation - basic concepts - animation techniques - animation for the web

Books :

References :

Module No : 4

Module – IV: (13 hours) Data compression - storage space and coding requirements - classification of coding/compression techniques - basic compression techniques like JPEG, H.261, MPEG and DVI - multimedia database systems - characteristics of multimedia database management system - data analysis - data structure - operations on data - integration in a database model

Books :

References :

IT04 705B Advanced Topics In Database Systems

Module No : 1

Module – I: (11 hours) Overview of relational database concept - object oriented database - overview of object oriented concepts - object definition language - object query languages - object database conceptional design - overview of CORBA standard for distributed objects

Books :

References :

Module No : 2

Module – II: (13 hours) Distributed database concepts - data fragmentation replication and allocation - types of distributed database system - query process - concurrency control for distributed database - overview of client - server architecture and its relationship to distributed database

Books :

References :

Module No : 3

Module – III: (13 hours) Deductive database - introduction to deduction database prolog/datalog notation - interpretation of rules - basic inference mechanism for logic programs - datalog programs and their evaluation - deduction database systems - data Warehousing and data mining - database on World Wide Web - multimedia database - mobile database - geographic information system - digital libraries

Books :

References :

Module No : 4

Module – IV: (15 hours) Oracle and Microsoft access - basic structure of the oracle system m database structures and its manipulation in oracle - storage organization programming oracle applications - oracle tools - an overview of Microsoft access features and functionality of access - distributed databases in oracle

Books : Elmasri & Navathe, Fundamentals of Database Systems, Addison Wesley

References : 1.Ramakrishnan R. & Gehrke J., Database Management Systems, McGraw Hill 2.O'neil P. & O'neil E., Database Principles, Programming, And Performance, Harcourt Asia (Morgan Kaufman) 3.Silberschatz, Korth H.F. & Sudarshan S., Database System Concepts, Tata McGraw Hill 4.Theory T.J., Database Modelling And Design, Harcourt Asia (Morgan Kaufman)

IT04 706(P) Network Lab

Module No : 1

Objective: This practical course includes experiments in computer networking using basic network components and systems there by allowing the students to gain an intuitive feel for network protocols. This course is very much significant both from research perspective and from application perspective. Lab - 1 : Implementation of PC to PC file transfer using serial port and MODEM. Lab - 2, 3 : Software simulation of IEEE 802.3, 802.4 and 802.5 protocols. Lab - 4, 5 : Software simulation of medium access control protocols – 1) Go back N 2) Selective repeat and 3) Sliding window. Lab – 6 : Implementation of a subset of simple mail transfer protocol using UDP Lab - 7, 8 : Implementation of a subset of file transfer protocol using TCP/IP Lab – 9 : Implementation of "finger" utility using remote procedure call (RPC) Lab – 10 : Generation and processing of HTML forms using CGI. Reference books 1.Richard S.W., Unix Network Programming, PHI 2.Comer D.E., Internetworking With TCP/IP, Vol.1, 2 & 3, PHI 3.Campione et. al M., The Java Tutorial Continued, Addison Wesley

Books :

References :

IT04 707(P) Seminar

Module No : 1

Objective Each student is expected to present a seminar on a topic of current relevance in Information Technology - they are expected to refer papers from standard journals like ACM, IEEE, JPDC, IEE, or RFCs (from www.ietf.org) etc - at least three cross references must be used - the seminar report must not be the reproduction of the original paper. Conduct and evaluation An evaluation committee must be formed to determine the schedule of activities and subsequently conduct evaluation. The members of the committee must be competent in academic qualification and experience. Students are supposed to select a topic in consultation with any of the members of committee. The committee may publish guidelines to complete this process easily. After this, an abstract may be submitted along with title of the seminar. A formal approval of the committee is necessary for the seminar presentation. In case of non-approval, the suggestions for reformulating it will be communicated to the students. The revised proposal may be submitted again to the committee in a different time slot. Sufficient number of chances may be given; the committee may device a time schedule to accommodate this revision process looking into the available time frame for seminar. A seminar report need to be submitted in a format insisted by the institution well in advance to the presentation. Marks may be awarded according to the following pattern:

Books :

References :

IT04 708(P) Project Work

Module No : 1

Guidelines for Project Formulation Objectives The project is aimed at improving the professional competency by touching the areas which otherwise is not covered in theory classes or laboratory classes – There is a greater realization of importance of the application of ideas to build a solution in complementing the learning process. The work practice here will help student develop ability to apply theoretical and practical tools/techniques to solve real life problems related to industry and current research. It is recommended to have connection between mini project and final year project. However, there is clear distinction in terms of time frame for project and mini project and hence problems must be selected carefully. Problems related to mini project domain should never be allowed here. Type of project Students may be given an introduction to problems related to industry and level of current research. They may be given idea about the state of technology in India and abroad and what an employer expect from them. They may be given idea about the venues for higher studies in India and abroad and what such institution expects from them. They may be given idea about opportunities of making use of technology and what capacities an entrepreneur should have for successfully running an enterprise. Then each student is assigned to a project. Two approaches are possible 1.To ask the students to select their work from already prepared list of works (prepared by a competitive person and revised from time to time) 2.To ask the students to select a relevant work which is approved by an approving authority In any case, the work selected may include the use of as many as possible from the following list. OS platforms: Relevant to the current state, with support for networked environment, for distributed computing, for development of multi-platform applications. For example latest GNU Linux with supporting packages. Internet technologies : XML, Scripting languages like Perl / Python, Middleware(Component) technologies, Architectural concepts like RMI / CORBA Front end / GUI: Code development (XWINDOWS in GNU Linux) or development based on tools(Qt designer, Jbuilder etc…) RDBMS/Back end: Relevant to current state, with database connectivity to different platforms. For example MySQL or PostgreSQL Languages: Qt, Glade or any similar 4GLs, scripting languages and C & C++ in GNU Linux (under GNU gcc) Universal n/w applications development platforms: JAVA, GNU .NET or any similar platform Unix internals : Device drivers, RPC, Threads, Socket programming Embedded systems : RTOS, Embedded hardware with software for an application, Code optimization, security etc… The project may be related to one of the following application areas: Financial / Manufacturing / Multimedia / Instructional design / DBMS / Networking or communication software development / Internet-intranet applications / TCP-IP programming / Protocol study / Operating systems / Distributed systems Projects should not be developed using the packages like Dbase III plus, Foxpro, Visual Foxpro and MS-Access. Projects should not be developed using the combination of Visual Basic as the front end and MS-Access as the back end. Students can also develop applications using tools / languages / software not listed above, if they are part of latest technologies. Existing open source projects may also be used, but the contribution of the group to the project should be clearly demarcated, distinguished and visible. Project work should compulsorily involve hardware and/or software development work; developing installation instructions, developing configuring instructions for LAN / WAN etc… are examples for works not involving any such development and hence are strictly not allowed. Format of report A format may be designed and enforced at each institution – Formats must be available in all current OS platforms and students must be asked to use a specific document preparation systems recommended by each institution – An interim report is to be submitted. Besides they may be asked to do a multi-media presentation using any presentation software; the formats and tools may again be standardized by each institution. Guidelines for conduct and evaluation: A committee may be constituted for conduct and co-ordination of project related activities. The

committee is responsible for developing schedules for various activities and keeping them. The functioning of a committee is over only after the final evaluation of the project. Project may be allotted to a student or groups of size at the most four. Each student may be asked to finalize a topic following the guidelines given above. After finalizing the topic and selection of guide, students should submit a Project proposal with approval of the guide. The project work can start only after the approval of the committee constituted. The institution has to offer infrastructure recommended by this committee till the completion of the project work. In case of non-approval, the suggestions for reformulating the project will be communicated to the students. The revised proposal may be submitted again to the committee in a different time slot. Sufficient number of chances may be given; the committee may device a time schedule to accommodate this revision process looking into the available time frame for the project. The project may be an in-house project or an external project. In any case, the student is associated with a guide. The guide must be competent in terms of academic qualifications and experience in the selected area. A list of guides available for a term may be published by the committee mentioned above. The project proposal should be prepared in consultation with guide. It states clearly the project objective and the environment of the proposed project to be undertaken. The following details may be included in it: 1.Title of the project 2.Objective of the project 3.Project category. 4.Information pertaining to analysis and design 5.Tools / Platforms, Hardware and software requirement specification. Students are supposed to go through initial software engineering activities related to the selected problem and may convince the guide about the genuineness of attempt. The proposal need be formed and forwarded for approval only after this. The proposal may be at the most ten pages in size. An assessment of the project work should be done at the end of the semester by the committee mentioned above. An interim report of at the most 20 pages on the work done must be submitted by the students with the approval of guide. Besides, they will make a presentation before the committee for the evaluation purpose. The assessment is made individually and in groups. The pattern for awarding marks will be as follows:

Books :

References :

EIGHTH SEMESTER

IT04 801 Management Information Systems	
Module No : 1	
Module – I: (12 hours) Information systems - functions of management - levels of management - framework for information systems - systems approach - systems concepts - systems and their environment - effects of system approach in information systems design - using systems approach in problem solving - strategic uses of information technology	
Books :	
References :	

Module No : 2

Module – II: (10 hours) An overview of computer hardware and software components - file and database management systems - introduction to network components - topologies and types - remote access - the reasons for managers to implement networks - distributed systems - the internet and office communications

Books :

References :

Module No : 3

Module – III: (14 hours) Application of information systems to functional - tactical and strategic areas of management, decision support systems and expert systems

Books :

References :

Module No : 4

Module – IV: (16 hours) Information systems planning - critical success factor - business system planning - ends/means analysis - organizing the information systems plan - systems analysis and design - alternative application development approaches - organization of data processing - security and ethical issues of information systems

Books :

References :

IT04 802 Mobile Communication Systems

Module No : 1

Module – I: (12 hours) Introduction - applications - history of wireless communications - reference model wireless transmission - frequencies for radio transmission - signals - antennas - signal propagation - multiplexing - modulation - spread sprectrum - cellular systems - medium access control - specialized MAC - SDMA - FDMA - TDMA - aloha - CSMA - collision avoidance - polling - CDMA - comparison of S/T/F/CDMA

Books :

References :

Module No : 2

Module – II: (12 hours) Telecommunication systems - GSM - mobile services - system architecture - radio interface - protocols - localization and calling - handover - security - new data services - DECT - TETRA - UMTS and IMT-2000 - satellite systems - history - applications - basics - rooting - localization - handover - examples - broadcast systems - overview - cyclic repetition of data - digital audio broadcasting - digital video broadcasting

Books :

References :

Module No : 3	
Module – III: (12 hours) Wireless LAN - infrared Vs radio transmissions - infrastructure and adhoc networks - IEEE 802.11 - HIPERLAN - bluetooth - wireless ATM - motivation for WATM working group - WATM services - reference model - functions - radio access layer - handover - location management - addressing - mobile quality of service - access point control protocol	
Books :	
References :	

Module No : 4	
Module – IV: (16 hours) Mobile network layer - mobile IP - packet delivery - registration - tunneling and encapsulation - optimizations - reverse tunneling - dynamic host configuration protocol - adhoc networks - routing - algorithms - metrics - mobile transport layer - TCP - indirect TCP - snooping TCP - mobile TCP - retransmission - recovery - transaction oriented TACP - support for mobility - file systems - WWW - WAP - architecture - datagram protocol - transport security - transaction protocol - session protocol - application - environment - WML - WML script - wireless telephony application - example stacks with WAP	
Books :	
References :	

IT04 803 Internet Technologies

Module No : 1	
Module – I: (14 hours) Network Applications-Client-Server Interaction-Socket Interface-Connection Oriented Service-Simple Client and Server example-Domain Name System-Electronic Mail - Representation and Transfer-VoIP-File Transfer and Remote File Access-RPC and Middleware-Initialization	
Books :	
References :	

Module No : 2	
Module – II: (12 hours) Multimedia networking-applications-streaming stored audio and video – internet telephony – RTP – scheduling and policing mechanisms – integrated services – RSVP – differentiated services – network management – the internet network management framework – network security – integrity, Access control attacks & control measures	
Books :	
References :	

Module No : 3	:
Module – III: (13 hours) E-commerce-Difference between E-commerce and E-Business, Unique features, types – Portals – E-distributor. Emerging E-commerce areas. Technology infrastructure – Internet and web features (case study not required). Building an E-commerce website- choosing server software- choosing hardware- E-commerce site tools. Security needs in E-commerce environment.	
Books :	
References :	

Module No : 4

Module – IV: (13 hours) E-commerce payment systems – credit cards, E-commerce transactions – digital payments in B2C arena - B2B payment systems, B2B E-commerce and Supply Chain Management – Evolution – Procurement process & Supply Chain Management – Trends in Supply Chain Management and collaborative commerce, Net Marketers – characteristics, types, e-distributors, e-procurement.

Books :

References :

IT04 804A Industrial Psychology

Module No : 1

Module – I: (13 hours) Introduction - psychology as a science - areas of applications - study of individual - individual differences - study of behavior - stimulus - response behavior - heredity and environment - human mind - cognition - character - thinking - attention - memory- emotion - traits - attitude - personality

Books :

References :

Module No : 2

Module – II: (13 hours) Organizational behavior - definition - development - fundamental concept - nature of people - nature of organization - an organizational behavior system - models - autocratic model - hybrid model - understanding a social - system social culture - managing communication - downward, upward and other forms of communication

Books :

References :

Module No : 3

Module – III: (13 hours) Motivation - motivation driver - human needs - behavior modification - goal setting - expectancy model - comparison models - interpreting motivational models - leadership - path goal model - style - contingency approach

Books :

References :

Module No : 4

Module – IV: (13 hours) Special topics in industrial psychology - managing group in organization - group and inter group dynamics -managing change and organizational development - nature planned change - resistance - characteristic of OD - OD process

Books :

References : Reference books 1.Davis K. & Newstrom J.W., "Human Behavior At Work", McGraw Hill International 2.Schermerhorn J.R. Jr., Hunt J.G. & Osborn R.N., "Managing Organizational Behavior", John Willy 3.Luthans, "Organizational Behavior", McGraw Hill

International 4.Morgan C.T., King R.A., Rweisz J. & Schoples J., "Introduction to Psychology", McGraw Hill 5.Blum M.L. & Naylor J.C., "Industrial Psychology", CBS Publisher, Horper & Row

IT04 805D Entre Preneurship

Module No : 1

Module – I: (20 hours) Entrepreneurial perspectives - understanding of entrepreneurship process - entrepreneurial decision process - entrepreneurship and economic development - characteristics of entrepreneur - entrepreneurial competencies - managerial functions for enterprise

Books :

References :

Module No : 2

Module – II: (10 hours) Process of business opportunity identification and evaluation - industrial policy - environment - market survey and market assessment - project report preparation - study of feasibility and viability of a project - assessment of risk in the industry

Books :

References :

Module No : 3

Module – III: (12 hours) Process and strategies for starting a venture - stages of small business growth - entrepreneurship in international environment - entrepreneurship - achievement motivation - time management creativity and innovation structure of the enterprise - planning, implementation and growth

Books :

References :

Module No : 4

Module – IV: (10 hours) Technology acquisition for small units - formalities to be completed for setting up a small scale unit - forms of organizations for small scale units - financing of project and working capital - venture capital and other equity assistance available - break even analysis and economic ratios technology transfer and business incubation

Books :

References : Reference books 1.Koontz H. & Weihrich H., Essentials of Management, McGraw Hill International 2.Hirich R.D. & Peters Irwin M.P., Entrepreneurship, McGraw Hill 3.Rao T.V. & Deshpande M.V., Prayag Metha, Nadakarni M.S., Developing Entrepreneurship A Hand Book, Learning Systems 4.Kurado D. & Hodgelts R.M.,

Entrepreneurship A Contemporary Approach, The Dryden Press 5.Dr Patel V.G., Seven Business Crisis, Tata McGraw Hill 6.Jeffry A Timmons, New Venture Creation - Entrepreneurship for 21st Century, McGraw Hill International 7.Patel J.B., Noid S.S., A Manual On Business Opportunity Identification, Selections, EDII 8.Rao C.R., Finance for Small Scale Industries 9.Pandey G.W., A Complete Guide to Successful Entrepreneurship, Vikas Publishing

IT04 806(P) Graphics And Multimedia Lab

Module No : 1

Lab 1 : Basic raster drawing algorithms implementations (lines, circle, ellipse, polygons etc.) Lab 2 : mplementation of algorithms for 2D/3D object generation, transformations Lab 3 : Generate a 3D object, say a cube, and try to implement the following using any standard graphic library set (for example OpenGL library) on a selected OS 1. Viewing transformations 2. Modeling transformations 3. Projection transformations 4. Drawing a scene (2D picture of 3D space or a shot by camera) involving object Lab 4 : Generate a 3D object, say a sphere, based on surfaces or polygonal faces or wireframe approach and render it defining a material, light source and lighting model properties using any standard graphic library set (for example OpenGL library) on a selected OS Lab 5 : Model a scene containing several 3D objects, say table top having several objects - each object may be modelled as given in above experiment - also render the scene with hidden surfaces in mind - rendering considering a light source may also be practiced - this again is using standard graphic library set on a selected OS Lab 6 : Use source code of any freely available sound recording, encoding / decoding software - encoding / decoding portions may be removed before actual experimentation - study any three audio formats to learn about (a) file size (b) popularity (c) quality of audio reproduced. Do the following in a chosen OS 1. Record sound for 10 secs 2. Convert from one format to other 3. Playback both the formats and analyze the results Lab 7 : Study any 5 popular still image formats (JPEG, BMP included) - do the following in a chosen OS 1. Take a snap of face of a person using digital camera or a webcam 2. Use any photo editing tools (say, Adobe Photoshop) to get desired size, desired resolution photo(both color and black and white may be generated). Paint touching may also be practiced 3. Create the image of a decorated greeting card or an identity card using image creation tools and insert the photo and print it. Verify for color matching and size of the image Lab8 : Use a MPEG decoder source code freely available from internet and do the following in a chosen OS 1. Play MPEG video 2. Modify the source code so that play can be done frame by frame Lab 9 : Use any web animation authoring tool, say macromedia flash, on a chosen OS to create simple animations Lab 10 : Learn to use server and client software for streaming media - pick any freely available software on a chosen OS - create a web page with multimedia content and providing interaction in some form to a user

Books :

References :

IT04 807(P) Project Work	
Module No : 1	**Module Name :**
Guidelines for completion of project The project work started in seventh semester is to be continued here. In the rare special case of a student joining in eighth semester(due to year out or shortage of attendance), the design part mentioned in 708(P) Project has to be repeated following the guidelines there. However, the duration of the project need to be limited to a semester. Format of report A format may be designed and enforced at each institution - formats must be available in all current OS platforms and students must be asked to use a specific document preparation systems recommended by each institution - they may be asked to provide the report in electronic form also - this electronic form, made available in CD, will contain the entire project document besides multi-media illustration material prepared using any presentation software - Each student has to submit a technical report about work done and a detailed report of work done; these may also be provide in the CD. Guidelines for conduct and evaluation: The committee constituted in the seventh semester will continue with the remaining activities. The committee is responsible for developing schedules for various activities remaining and keeping them. The functioning of a committee is over only after the final evaluation of the project. The committee mentioned above should do an assessment of the project work at the end of the eighth semester. The project must be submitted in a technical paper format with a maximum of eight pages in single line spacing of 12 point Times New Roman Font. A detailed report may be submitted to the guide for his assessment. Besides, they will make a presentation and demonstration of work done by them before the committee mentioned above for their assessment. The assessment is thus done in individual and in groups. The pattern for awarding marks will be as follows: 1.Attendance: 10 marks 2.Technical report, work done and presentation evaluated by committee : 60 marks 3.Work record and individual assessment by guide : 30 marks Total = 100 marks For external projects, evaluation of attendance may be done on the basis of proof of attendance provided by a competent authority of the external agency. In addition, the technical report may contain a certificate from competent authority of the external agency as proof for originality of work done by the student at their premise.	
Books :	
References :	

IT04 808(P) Viva Voce	
Module No : 1	**Module Name :**
Each student is required to appear for the viva-voce examination on the project work and seminar, and also on the various subjects prescribed for the course - the project and seminar reports are to be produced for the viva-vice examination - the examiners will ask questions from subjects studied for the B.Tech course, mini project, project and seminar reports of the student . There is only University examination for Viva-voce. University will appoint examiners to conduct this. The mark distribution should be as follows:	
Books :	
References :	