

ACADEMIC REGULATIONS COURSE STRUCTURE AND DETAILED SYLLABUS

U6

Information Technology

For
B.Tech Four Year Degree Course
(Applicable for the batch admitted in 2011-2012)
(MR11 Regulations)

(II & III year's syllabus only)



MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

(Approved by AICTE & Affiliated to JNTUH)
Maisammaguda, Dhulapally (Po) Via (Hakimpet), Secunderabad- 500 014.

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MALLA REDDY GROUP OF INSTITUTIONS



**ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS**

Information Technology



For
B.Tech Four Year Degree Course
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**MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)
B. TECH. INFORMATION TECHNOLOGY
I YEAR COURSE STRUCTURE**

| Code | Subject | L | T/P/D | C |
|--------------|---|-----------|-----------|-----------|
| EN1Y1101 | English | 2 | 1 | 4 |
| MA1Y1102 | Mathematics-I | 3 | 1 | 6 |
| MA1Y1103 | Mathematical Methods | 3 | 1 | 6 |
| PH1Y1104 | Engineering Physics | 2 | 1 | 4 |
| CH1Y1105 | Engineering Chemistry | 2 | 1 | 4 |
| CS1Y1106 | Computer Programming & Data Structures | 3 | -- | 6 |
| ME1Y1107 | Engineering Drawing | 2 | 3 | 4 |
| CS1Y1108 | Computer Programming Lab | -- | 3 | 4 |
| PCH1Y1109 | Engineering Physics & Engineering Chemistry Lab | -- | 3 | 4 |
| EN1Y1110 | English Language Communication Skills Lab | -- | 3 | 4 |
| MCS1Y1111 | Engineering Workshop/IT Workshop | -- | 3 | 4 |
| Total | | 17 | 20 | 50 |

**MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)
B. TECH. INFORMATION TECHNOLOGY**

II Year **I Semester**

COURSE STRUCTURE

| Code | Subject | L | T/P/D | C |
|--------------|--|-----------|-----------|-----------|
| MR11U601 | Data Communication Systems | 3 | 1 | 3 |
| MR11U501 | Mathematical Foundations of Computer Science | 3 | 1 | 3 |
| MR11U502 | Data Structures Through C++ | 4 | 1 | 4 |
| MR11U452 | Digital Logic Design & and Computer Organization | 4 | 1 | 4 |
| MR11U154 | Environmental Studies | 3 | 1 | 3 |
| MR11U244 | Basic Electrical and Electronics Engineering | 4 | - | 4 |
| MR11U503 | Data Structures Lab Through C++ | 0 | 3 | 2 |
| MR11U245 | Electrical and Electronics Lab | 0 | 3 | 2 |
| Total | | 21 | 11 | 25 |

**MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)**

B. TECH. INFORMATION TECHNOLOGY

II Year

II Semester

COURSE STRUCTURE

| Code | Subject | L | T/P/D | C |
|--------------|---|-----------|-----------|-----------|
| MR11U512 | Principles of Programming languages | 4 | 1 | 4 |
| MR11U505 | Data Base Management Systems | 4 | 1 | 4 |
| MR11U506 | Object Oriented Programming | 4 | - | 4 |
| MR11UB01 | Managerial Economics and Financial Analysis | 3 | 1 | 3 |
| MR11U509 | Design and Analysis of Algorithm | 3 | 1 | 3 |
| MR11U0M3 | Probability and Statistics | 3 | 1 | 3 |
| MR11U510 | Object Oriented Programming Lab | 0 | 3 | 2 |
| MR11U511 | Data Base Management Systems Lab | 0 | 3 | 2 |
| Total | | 21 | 11 | 25 |

**MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)**

B. TECH. INFORMATION TECHNOLOGY

III Year

I Semester

COURSE STRUCTURE

| Code | Subject | L | T/P/D | C |
|--------------|--|-----------|-----------|-----------|
| MR11U602 | Automata and Compiler Design | 4 | 1 | 4 |
| MR11U522 | Linux Programming | 3 | 1 | 3 |
| MR11U507 | Software Engineering | 3 | 1 | 3 |
| MR11U514 | Operating Systems | 4 | 1 | 4 |
| MR11U603 | Computer Networks | 4 | 1 | 4 |
| MR11UB02 | Management Science | 3 | - | 3 |
| MR11U0E1 | Advanced English Communication Skills Lab | 0 | 3 | 2 |
| MR11U604 | Operating Systems & Computer Networks Lab (Through Linux) | 0 | 3 | 2 |
| Total | | 21 | 11 | 25 |

**MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)**

B. TECH. INFORMATION TECHNOLOGY

III Year

II Semester

COURSE STRUCTURE

| Code | Subject | L | T/P/D | C |
|-----------------|--|-----------|-----------|-----------|
| MR11U605 | Web Technologies | 4 | 1 | 4 |
| MR11U0M5 | Operations Research (Open Elective) | 3 | 1 | 3 |
| MR11U606 | Intellectual Property Rights & Cyber Law (Open Elective) | 3 | 1 | 3 |
| MR11U513 | Computer Forensics (Open Elective) | 3 | 1 | 3 |
| MR11U519 | Network Security | 3 | 1 | 3 |
| MR11U525 | Computer Graphics | 4 | 1 | 4 |
| MR11U524 | Data Warehousing and Data Mining | 4 | - | 4 |
| MR11U450 | Embedded Systems | 3 | 1 | 3 |
| MR11U607 | Embedded Systems & Data Mining Lab | 0 | 3 | 2 |
| MR11U608 | Web Technologies Lab | 0 | 3 | 2 |
| Total | | 21 | 11 | 25 |

**MALLA REDDY ENGINEERING COLLEGE
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B. TECH. INFORMATION TECHNOLOGY

IV Year

I Semester

COURSE STRUCTURE

| Code | Subject | L | T/P/D | C |
|-----------------|---|-----------|-----------|-----------|
| MR11U518 | Software Testing Methodologies | 3 | 1 | 3 |
| MR11U517 | Object Oriented Analysis and Design | 4 | - | 4 |
| MR11U609 | Mobile Application Development | 3 | 1 | 3 |
| MR11U423 | VLSI Design | 4 | 1 | 4 |
| | ELECTIVE –I : | | | |
| MR11U610 | Wireless Networks And Mobile Computing | 3 | 1 | 3 |
| MR11U611 | Image Processing And Pattern Recognition | 3 | 1 | 3 |
| MR11U530 | Soft Computing | 3 | 1 | 3 |
| MR11U536 | Semantic Web And Social Network | 3 | 1 | 3 |
| | ELECTIVE – II : | | | |
| MR11U531 | Information Retrieval Systems | 4 | 1 | 4 |
| MR11U612 | Human Computer Interaction | 4 | 1 | 4 |
| MR11U613 | Multimedia and Rich Internet Applications | 4 | 1 | 4 |
| MR11U537 | Scripting Languages | 4 | 1 | 4 |
| MR11U533 | Casetools and Software Testing Lab | 0 | 3 | 2 |
| MR11U614 | Mobile Application Development Lab | 0 | 3 | 2 |
| Total | | 21 | 11 | 25 |

**MALLA REDDY ENGINEERING COLLEGE
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B. TECH. INFORMATION TECHNOLOGY

IV Year

II Semester

COURSE STRUCTURE

| Code | Subject | L | T/P/D | C |
|--------------|--------------------------------|----------|-----------|-----------|
| MR11U534 | Software Project Management | 3 | - | 3 |
| | ELECTIVE III: | | | |
| MR11U535 | Web Services | 3 | 1 | 3 |
| MR11U615 | E-Commerce | 3 | 1 | 3 |
| MR11U616 | Middle Ware Technologies | 3 | 1 | 3 |
| MR11U538 | Adhoc and Sensor Network | 3 | 1 | 3 |
| | ELECTIVE IV: | | | |
| MR11U617 | Design Patterns | 3 | 1 | 3 |
| MR11U618 | Distributed Systems | 3 | 1 | 3 |
| MR11U539 | Storage Area Networks | 3 | 1 | 3 |
| MR11U527 | Cloud Computing | 3 | 1 | 3 |
| MR11U619 | Industry Oriented Mini Project | 0 | 0 | 2 |
| MR11U620 | Seminar | 0 | 6 | 2 |
| MR11U621 | Project Work | 0 | 15 | 10 |
| MR11U622 | Comprehensive Viva | 0 | 0 | 2 |
| Total | | 9 | 23 | 25 |

Note: All End Examinations (Theory and Practical) are of three hours duration.
T – Theory P – Practical C – Credits

Data Communication Systems**Unit I:**

Introduction to Data Communications and Networking: Standards Organizations for Data Communications, Layered Network Architecture, Open Systems Interconnection, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Circuit Arrangements, Data communications Networks, Alternate Protocol Suites.

Signals, Noise, Modulation, and Demodulation:

Signal Analysis, Electrical Noise and Signal-to-Noise Ratio, Analog Modulation Systems, Information Capacity, Bits, Bit Rate, Baud, and M-ary Encoding, Digital Modulation.

Unit II:**Metallic Cable Transmission Media:**

Metallic Transmission Lines, Transverse Electromagnetic Waves, Characteristics of Electromagnetic Waves, Transmission Line Classifications, Metallic Transmission Line Types, Metallic Transmission Line Equivalent Circuit, Wave Propagation on Metallic Transmission Lines, Metallic Transmission Line Losses.

Optical Fiber Transmission Media:

Advantages of Optical Fiber Cables, Disadvantages of Optical Fiber Cables, Electromagnetic spectrum, Optical Fiber Communications System Block Diagram, Optical Fiber construction, The Physics of Light, Velocity of Propagation, Propagation of Light Through an Optical fiber Cable, Optical Fiber Modes and Classifications, Optical Fiber Comparison, Losses in Optical Fiber Cables, Light sources, Light Detectors, Lasers.

Unit III:**Digital Transmission:**

Pulse Modulation, Pulse code Modulation, Dynamic Range, Signal Voltage –to-Quantization Noise Voltage Ration, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed, Delta Modulation PCM and Differential PCM.

Multiplexing and T Carriers:

Time- Division Multiplexing, T1 Digital Carrier System, North American Digital Multiplexing Hierarchy, Digital Line Encoding, T Carrier systems, European Time- Division Multiplexing, Statistical Time – Division Multiplexing, Frame Synchronization, Frequency- Division Multiplexing, Wavelength- Division Multiplexing, Synchronous Optical Network

Unit IV:**Wireless Communications Systems:**

Electromagnetic Polarization, Rays and Wavefronts, Electromagnetic Radiation, Spherical Wavefront and the Inverse Square Law, wave Attenuation and Absorption, Optical Properties of Radio Waves, Terrestrial Propagation of Electromagnetic Waves, Skip Distance, Free-Space Path Loss, Microwave Communications Systems, Satellite Communications Systems.

Unit V:**Telephone Instruments and Signals:**

The Subscriber Loop, Standard Telephone Set, Basic Telephone Call Procedures, Call Progress Tones and Signals, Cordless Telephones, Caller ID, Electronic Telephones, Paging systems.

The Telephone Circuit:

The Local Subscriber Loop, Telephone Message- Channel Noise and Noise Weighting, Units of Powers Measurement, Transmission Parameters and Private-Line Circuits, Voice-Frequency Circuit Arrangements, Crosstalk.

Unit VI:**Cellular Telephone Systems:**

First- Generation Analog Cellular Telephone, Personal Communications system, Second-Generation Cellular Telephone Systems, N-AMPS, Digital Cellular Telephone, Interim Standard, North American Cellular and PCS Summary, Global system for Mobile Communications, Personal Communications Satellite System.

Unit VII:**Data Communications Codes, Error Control, and Data Formats:**

Data Communications Character Codes, Bar Codes, Error Control, Error Detection, Error Correction, Character Synchronization.

Data Communications Equipment:

Digital Service Unit and Channel Service Unit, Voice- Band Data Communication Modems, Bell Systems- Compatible Voice- Band Modems, Voice- Band Modern Block Diagram, Voice-Band Modem Classifications, Asynchronous Voice-Band Modems, Synchronous Voice-Band Modems, Modem Synchronization, ITU-T Voice- Band Modem Specifications, 56K Modems, Modem Control: The AT Command Set, Cable Modems, Probability of Error and Bit Error Rate.

Unit VIII:**Data –Link Protocols:**

Data –Link Protocol Functions, Character –and Bit- Oriented Protocols, Data Transmission Modes, Asynchronous Data – Link Protocols, Synchronous Data – Link Protocols, Synchronous Data – Link Control, High– Level Data – Link Control.

Text Books:

1. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

Reference Books:

1. Data Communications and Networking, Behrouz A Forouzan, Fourth Edition. TMH.
2. Computer Communications and Networking Technologies, Gallow, Second Edition Thomson
3. Computer Networking and Internet, Fred Halsll, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education

Mathematical foundations of computer science**UNIT-I**

Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, Universal Quantifiers.

UNIT-II

Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-III

Relations : Properties of binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties.

UNIT-IV

Algebraic structures: Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT-V

Elementary Combinatorics: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application.

UNIT-VI

Recurrence Relation: Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT-VII

Graph Theory: Representation of Graph, DFS, BFS, Spanning Trees, and planar Graphs

UNIT-VIII

Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

Text Books:

1. Elements of Discrete Mathematics-A Computer Oriented Approach-C L Liu,D P Mohapatra.Third Edition,Tata McGraw Hill.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker PHI.

Reference Books:

1. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education
2. Discrete Mathematics with Applications, Thomas Koshy, Elsevier
3. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
4. Discrete Mathematical structures Theory and application-Malik & Sen,Cengage.
5. Logic and Discrete Mathematics, Grass Man & Trembley, Pearson Education.

Data Structures Through C++**UNIT I:**

C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

UNIT II:

Function Over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT III:

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures- The list ADT, Stack ADT, Queue ADT, Arrays and Linked Implementation using template classes in C++.

Trees - Basic Terminology, Binary tree ADT, array and linked representations, traversals, threaded binary trees.

UNIT IV:

Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

UNIT V:

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, Heap Sort, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

UNIT VI:

Search Trees (**Part-I**):-

Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Operations – Insertion and Searching.

UNIT VII:

Search trees (part-II): B-Trees, Definition, B-Tree of order m, insertion, deletion and searching, Comparison of Search Trees. Graphs-Basic Terminology, representations of graphs, Graph search Methods-DFS, BFS.

UNIT VIII:

Text Processing: Pattern matching algorithms-Brute force, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, and Suffix tries.

Text Books:

1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley student edition, seventh edition, John Wiley and Sons.

Reference Books:

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Cengage learning.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
5. Data Structures using C++,D.S.Malik,Cengage Learning,India Edition
6. Data Structure with C++ Using STL,2nd Edition,W.H.Ford and W.R.Topp, Pearson/PHI
7. Mastering Algorithms with C, K.Loudon,O'Reilly,SPD Pvt Ltd
8. An Introduction to Data Structure & Algorithms, J.A.Storer, Springer
9. Advanced Data Structures & Algorithms in C++,V.V.Muniswamy,Jaico Publishing House.

2011-2012

Code: MR11U452

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

II Year B.Tech. IT – I Sem

L T/P/D C
4 1/ -/- 4**Digital Logic Design and Computer Organization****UNIT I:****Basic Structure of Computers:** Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, computer Generations.**Data Representation:** Binary Numbers, Fixed Point Representation. Floating- point Representation. Number base conversions, Octal and Hexadecimal Number, complements, Signed binary numbers, Binary codes.**UNIT II:****Digital logic circuits- I:**

Basic Logic Functions, Logic gates, Universal logic gates, Minimization of Logic expressions. Flip- flops.

UNIT III:**Digital logic circuits-II:**

Registers, Shift Registers, Binary counters, Decoders, multiplexers, Programmable logic devices.

UNIT IV:**Computer Arithmetic:** Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations. Hardware Implementation of arithmetic and logic operations, High performance arithmetic.**UNIT V:****Instruction Set & Addressing:** Memory Locations and Addresses, Machine addresses and sequencing. Various Addressing Modes, Instruction Formats, Basic Machine Instructions. IA-32 Pentium example.**UNIT VI:****Processor Organization:** Introduction to CPU, Register Transfers, Execution of Instructions, Multiple Bus Organization, Hardwired Control, Micro programmed Control.**UNIT VII:****Memory Organization:** Concept Of memory, RAM, ROM memories, memory hierarchy, cache memories, virtual memory, secondary storage, memory management requirements.**UNIT VIII****Input / Output Organization:** Introduction to I/O, Interrupts - Hardware, Enabling and disabling Interrupts, Device Control, Direct Memory access, buses, interface circuits, standard I/O interfaces.

Text Books:

- 1 Computer Organization- Carl Hamacher, Zvonko Vranesic, Safwat Zaky fifth edition, McGraw Hill.
- 2 Computer Architecture and Organization-An Integrated Approach, Miles Murdocca, Vincent Heuring Second Edition ,Wiley India.
- 3 Computer Systems Architecture- M. Moris Mano , IIIrd Edition Pearson.

Refernces Books:

- 1 Computer Organization and Architecture –William Stallings Sixth Edition, Pearson.
- 2 Computer- organization and Design-David A. Paterson and John L.Hennessy-Elsevier.
- 3 Fundamentals of Computer Organization and Design-Sivarama Dandamudi Springer Int. Edition.
- 4 Digital Design-Third Edition, M. Morris Mano, Pearson Education PHI.
- 5 Fundamentals of logic design, Roth 5th Edition Thomson

2011-2012

Code: MR11U154

MALLA REDDY ENGINEERING COLLEGE

(Autonomous)

II Year B.Tech. IT I-Sem

| L | T/P/D | C |
|---|-------|---|
| 3 | 1/- | 3 |

Environmental Studies**UNIT I:**

Ecosystems: Definition, Scope and importance of ecosystem, concept of ecosystem, classification of ecosystem, structure and structural components of an ecosystem, functions of an ecosystem. Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Homeostasis / Cybernetics, Food chain concentration, Biomagnification, ecosystems values, services and carrying capacity.

UNIT II:

Natural Resources: classification of resources – Living and Non-Living resources, Renewable and non-renewable resources. Water resources: Use and over utilization of surface and ground water, Floods, droughts. Dams: benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources- case studies. Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources- Case studies. Land resources: Land as a resource, land degradation, man induced landslides and land use / land cover mapping.

UNIT III:

Biodiversity and its conservation: Introduction - Definition: genetic, species and ecosystem diversity. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and intrinsic values. Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Conservation of biodiversity: In-situ and Ex-situ conservation. Food and fodder resources, Timber and non-timber forest products.

UNIT IV:

Environmental Pollution and Control: Classification of pollution and pollutants, causes, effects and control technologies. Air Pollution: Primary and secondary pollutants, Automobile and industrial Pollution. Ambient air quality standards. Water pollution : Point and non-Point sources of pollution, Major pollution of water and their sources, drinking water quality standards, Waste water treatment methods :effluent treatment plants (ETP), Sewage treatment plants (STP), common and combined effluent treatment plants(CETP). Soil pollution : Soil as sink for pollutants, Impact of modern agriculture on soil, degradation of soil. Marine pollution : Misuse of International water for dumping of hazardous waste, coastal pollution due to sewage and marine disposal of industrial effluents. Noise pollution : Sources, Industrial Noise – Occupational Health hazards, standards, Methods of control of Noise. Thermal pollution: Thermal Comforts, Heat Island effect, Radiation effects. Nuclear Pollution: Nuclear power plants, nuclear radiation, disasters and impacts, genetical disorders. **Solid waste:** types, Collection processing and disposal of industrial and municipal solid waste composition and characteristics of e-Waste and its management.

UNIT V:

Global Environmental problems and Global effects: Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and

desertification. International conventions/ Protocols: Earth summit, Kyoto protocol and Montreal Protocol.

UNIT VI:

Environmental impact assessment (EIA) and Environmental management plan: Definition of impact: classification of impacts, Positive and Negative, Reversible and irreversible, light, moderate and severe, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society. Prediction of impacts and impact assessment methodologies. Environmental Impact Statement(EIS). Environmental Management Plan(EMP): Technological Solutions, preventive methods, Control technologies, treatment technologies: green-belt-development, rain water harvesting, Remote sensing and GIS methods.

UNIT VII:

Environmental policy, legislation, rules and regulations: National Environmental Policy, Environmental Protection act, Legal aspects Air(Prevention and Control of pollution) Act-1981, Water(Prevention and Control of pollution) Act-1974, Water pollution Cess Act-1977, Forest Conservation Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules.

UNIT VIII:

Towards sustainable future: Concept of sustainable Development, Threats to Sustainability, Pollution and its explosion. Crazy Consumerism, Over-exploitation of resources. Strategies for Achieving Sustainable development, Environmental Education. Conservation of Resources, Urban Sprawl, Sustainable Cities and Sustainable Communities, Human health. Role of IT in Environment, Environment Ethics, Environmental Economics, Concept of Green Building, Clean Development Mechanism(CDM).

Text Book:

- 1 Environmental Studies, from crisis to cure by R. Rajagopalan, 2005.
- 2 Textbook of Environmental Science and Technology by M.Anji Reddy 2007.
- 3 Environmental Studies by Erach Bharucha 2005, University Grants Commission, University Press.

Reference Books:

1. Environmental Sciences: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P.Ela. 2008 PHI Learning Pvt. Ltd.

2011-2012

Code: MR11U244

MALLA REDDY ENGINEERING COLLEGE

(Autonomous)

II Year B.Tech. IT I-Sem

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Basic Electrical and Electronics Engineering

UNIT – I

Introduction to Electrical Engineering: Electric field; electric current, potential and potential difference, electromotive force, electric power, ohm's law, basic circuit components, electromagnetism related laws, Magnetic field due to electric current flow, force on a current carrying conductor placed in a magnetic field, Faradays laws of electromagnetic induction. Types of induced EMF's, Kirchoff's laws, Simple problems.

UNIT-II

Network Analysis : Basic definitions, types of elements , types of sources, resistive networks, inductive networks, capacitive networks, series parallel circuits, star delta and delta star transformation , Network theorems- Superposition , Thevenins's, Nortons & Maximum power transfer theorems and simple problems.

UNIT-III

Magnetic Circuits: Basic definitions, analogy between electric and magnetic circuits.

Transformers: Principles of operation, Constructional Details, EMF equation, simple problems.

UNIT-IV

Direct current machines: Principle of operation of dc machines, armature windings, e.m.f equation in a dc machine, Torque production in a dc machine, Operation of a dc machine as a generator, operation of a dc machine as a motor.

A.C Machines: Three phase induction motor, principle of operation, slip and rotor frequency, torque (simple Problems). Synchronous Machines: Principle of operation, EMF equation (Simple problems on EMF).

UNIT-V

Junction Diode Characteristics: Open- circuited p-n junction, The p-n junction Energy band diagram of PN diode, PN diode as a rectifier (forward bias and reverse bias), The current components in p-n diode, Law of junction, Diode equation, Volt-ampere characteristics of p-n diode, Temperature dependence of VI characteristic, Transition and Diffusion capacitances, Step graded junction, Breakdown Mechanisms in Semi Conductor (Avalanche and Zener breakdown) Diodes, Zener diode characteristics, Characteristics of Tunnel Diode with the help of energy band diagrams, Varactor Diode, LED, LCD.

UNIT- VI

Transistor and FET Characteristics: Junction transistor, Transistor current components, Transistor as an amplifier, Transistor alpha, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations, Relation between Alpha and Beta, typical transistor junction voltage values, JFET characteristics (Qualitative and Quantitative discussion), Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Symbols of MOSFET, Comparison of Transistors, Introduction to SCR and UJT.

UNIT- VII

Amplifiers : Small signal low frequency transistor amplifier circuits: h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters. Comparison of transistor configurations in terms of A_i , R_i , A_v , R_o . Feedback amplifiers concepts : Feedback Amplifier types; block diagram approach, simple relations (qualitative treatment).

UNIT-VIII

Oscillators: Condition for oscillations. RC-phase shift oscillators with Transistor and FET, Hartley and Colpitts oscillators, Wein bridge oscillator, RC, BJT & FET oscillators. Fundamentals of feedback amplifiers and types - RC, Colpitts, Hartley oscillators, stability of oscillators.

Text Books:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.
3. Electronic Devices and Circuits – J.Millman, C.C.Halkias, and Satyabratha Jit Tata McGraw Hill, 2nd Ed.,2007.
4. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,9th Edition, 2006.

Reference Books:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin Pearson.
4. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th edition, 2004.
5. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn., 1998.
6. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988.
7. Electronic Devices and Circuits – Dr. K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.

2011-2012

Code: MR11U503

MALLA REDDY ENGINEERING COLLEGE

(Autonomous)

II Year B.Tech. IT I-Sem

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Data Structures Lab through C++

Objectives:

- To make the student learn an object oriented way of solving problems.
- To make the student write ADTS for all data structures.

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space
- C++ compiler and STL Recommended

Week1- C++ programs to implement the following using an array.

- a) Stack ADT b) Queue ADT

Week2- Write C++ programs to implement the following using a singly linked list.

- a) Stack ADT b) Queue ADT

Week3- Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

Week 4- Write a C++ program to perform the following operations:

- a) Insert an element into a binary search tree.
b) Delete an element from a binary search tree.
c) Search for a key element in a binary search tree.

Week5- Write C++ programs that use recursive functions to traverse the given binary tree in

- a) Preorder b) inorder and c) postorder.

Week6- Write C++ programs that use non-recursive functions to traverse the given binary tree in

- a) Preorder b) inorder and c) postorder.

Week7- Write C++ programs for the implementation of bfs and dfs for a given graph.

Week8- Write C++ programs for implementing the following sorting methods:

- a) Merge sort b) Heap sort

Week9- Write a C++ program to perform the following operations

- a) Insertion into a B-tree b) Deletion from a B-tree

Week10- Write a C++ program to perform the following operations

- a) Insertion into an AVL-tree b) Deletion from an AVL-tree

Week11 :

Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

Week12 :

Write a C++ program for implementing Knuth-Morris- Pratt pattern matching algorithm.

(Note: Use Class Templates In the above Programs)

Text Books:

1. Data Structures A Pseudocode Approach with C++, Indian edition, R.F. Gilberg and B.A. Forouzan, Cengage Learning.
2. Programming Principles and Practice using C++, B. Stroustrup, Addison-Wesley (Pearson education).
3. Data Structure and STL, W.J. Collins, McGraw Hill, International edition.
4. Data Structures and algorithms with OODesign patterns in C++, B.R. Priss, John Wiley & Sons
5. The Art, Philosophy and Science of OOP with C++, Risk Miller, SPD
6. C++ for Programmers, P.J. Deitel and H.M. Dietel, PHI/Pearson.

Basic Electrical and Electronics Lab

PART - A

1. Verification of Superposition and Reciprocity theorems.
2. Verification of maximum power transfer theorem. Verification on DC, with Resistive load.
3. Experimental determination of Thevenin's Theorem.
4. Magnetization characteristics of D.C. Shunt generator.
5. Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
6. Brake test on DC shunt motor. Determination of performance Characteristics.
7. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors).
8. Brake test on 3-phase Induction motor (performance characteristics).

PART - B

1. PN Junction Diode Characteristics (Forward bias, Reverse bias)
2. Zener Diode Characteristics
3. Transistor CE Characteristics (Input and Output)
4. Rectifier without Filters (Full wave & half wave)
5. Rectifier with Filters (Full wave & half wave)

Principles of Programming Languages

UNIT I:

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments.

UNIT II:

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

UNIT III:

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT IV:

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT-V:

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT VI:

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

UNIT VII:

Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java.

Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT VIII:

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Scripting Languages: Pragmatics, Key Concepts, Case study: Python – Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction, Separate Compilation, Module Library.

Text Books:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
2. Programming Language Design Concepts, D.A. Watt, Wiley dreamtech, rp-2007.

Reference Books:

1. Programming languages, 2nd Edition, A.B.Tucker, R.E.Noonan, TMH.
2. Programming Languages, K.C.Louden, 2nd Edition, Thomson, 2003.
3. LISP, Patric Henry Winston and Paul Horn, Pearson Education.
4. Programming in PROLOG , W.F.Clocks in & C.S.Mellish, 5th Edition, Springer.
5. Programming Python, M.Lutz, 3rd Edition, O'relly, SPD, rp-2007.
6. Core Python Programming, Chun, II Edition, Pearson Education, 2007.
7. Guide to Programming with Python, Michael Dawson, Thomson, 2008.

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MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech. IT II-Sem

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Data Base Management Systems

UNIT I:

Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor

UNIT II:

History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT III:

Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.
Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT IV:

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT V:

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT VI:

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation-Based Protocols – Multiple Granularity.

UNIT VII:

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

UNIT VIII:

Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Text Books:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. Data base System Concepts, Silberschatz, Korth, McGraw hill, V edition.

Reference Books:

1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education
4. Oracle for Professionals, The X Team, S.Shah and V.Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M.L.Gillenson, Wiley Student Edition

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II Year B.Tech. IT II-Sem

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Object Oriented Programming

UNIT I

Object oriented thinking: Need for oop paradigm, A way of viewing world – Agents, responsibility, messages, methods, classes and instances, class hierarchies(Inheritance), method binding, overriding and exceptions, summary of OOP concepts, coping with complexity, abstraction mechanism.

UNIT II

Java Basics: History of Java, Java Buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, exploring String class.

UNIT III

Inheritance: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, Polymorphism, method overriding, abstract classes, the object class.

UNIT IV

Packages and Interfaces: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Exploring java.io

UNIT V

Exception Handling: Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws, finally, built in exceptions, creating own exception sub classes. String Handling, Exploring java.util.

UNIT VI

Multithreading: Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads; inter thread communication, thread groups, daemon threads. Enumerations, autoboxing, annotations, generics.

UNIT VII

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels- scroll pane, dialogs, menu bar, graphics, layout managerlayout manager types- border, grid, flow, card and grid bag.

UNIT VIII

Applets: Concepts of Applets, difference between applets and applications, life cycle of an applet, types of applets, creating applets. Passing parameters to applets.

Swing: Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons- The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables

Text Books:

1. Java; the complete reference, 7th edition, Herbert Schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

References Books:

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John Wiley & Sons.
2. An Introduction to OOP, third edition, T. Budd, Pearson Education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, Pearson Education.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, eighth Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, eighth Edition, Pearson Education.
7. Object Oriented Programming through Java, R.Buyya, S.T.Selvi, X.Chu, THM.
8. Java and Object Orientation, an Introduction, John Hunt, Second Edition Springer.
9. Maurach's Beginning Java2 JDK5, SPD.
10. Programming and Problem Solving with Java, JM Slack, BS Publications.

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MALLA REDDY ENGINEERING COLLEGE

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II Year B.Tech. IT II-Sem

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Managerial Economics And Financial Analysis

Unit I Introduction to Managerial Economics:

Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Unit II Elasticity of Demand:

Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

Unit III Theory of Production and Cost Analysis:

Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts, Opportunity cost, fixed vs. Variable costs, explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems)- Managerial Significance and limitations of BEA.

Unit IV Introduction to Markets & Pricing Policies:

Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.

Objectives and Policies of Pricing- Methods of Pricing: Cost Plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two-Part Pricing, Block Pricing, Bundling Pricing, Peak Load Pricing, Cross Subsidization.

Unit V Business & New Economic Environment:

Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

Unit VI Capital and Capital Budgeting:

Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.

Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

Unit VII Introduction to Financial Accounting:

Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Unit VIII Financial Analysis through ratios:

Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Profit Ratio, P/E Ratio and EPS).

Text Books:

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.

Reference Books:

1. Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Scitech, 2009.
2. V.Rajasekarn & R.Lalitha, Financial Accounting, Pearson Education, New Delhi, 2010.
3. Suma Damodaran, Managerial Economics, Oxford University Press, 2009.
4. Domnick Salvatore: Managerial Economics in a Global Economy, 4th Edition, Cengage, 2009.
5. Subhash Sharma & M P Vittal, Financial Accounting for management, Text and cases, Machmillan 2008.
6. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2008.
7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2009.
8. Dwivedi: Managerial Economics, 6th Ed., Vikas, 2009.
9. M.Kasi Reddy, S.Saraswathi: Managerial Economics & Financial Accounting, PHI, 2007.
10. Erich A.Helfert: Techniques of Financial Analysis, Jaico 2007.

Prerequisites: Nil

Objective: To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making.

Codes/Tables: Present Value Tables need to be permitted into the examinations Hall.

Question Paper Pattern: 5 Questions to be answered out of 8 questions.

Out of eight questions 4 questions will be theory questions and 4 questions should be problems.

Each question should not have more than 3 bits.

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MALLA REDDY ENGINEERING COLLEGE

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II Year B.Tech. IT II-Sem

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Design and Analysis of Algorithms**UNIT I:**

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis - Space complexity, Time complexity, Asymptotic Notation - Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

UNIT II:

Disjoint Sets - disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT III:

Divide and conquer: General method, applications - Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT IV:

Greedy method: General method, applications - Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT V:

Dynamic Programming: General method, applications - Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT VI:

Backtracking: General method, applications - n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT VII:

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem - LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT VIII:

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP-Complete classes, Cook's theorem.

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Design and Analysis of algorithms - Parag Himanshu Dave, Himanshu Bhalchandra Dave Publisher: Pearson.
3. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John Wiley and sons.

Reference Books:

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, PHI Pvt. Ltd./ Pearson Education
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S. Tseng, R.C. Chang and T. Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
5. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Education.

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MALLA REDDY ENGINEERING COLLEGE

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II Year B.Tech. IT II-Sem

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Probability and Statistics**UNIT-I: Probability:**

Sample space and events – Probability – The axioms of probability – Addition, Multiplication theorems - Conditional probability – Baye's theorem. and problems.

UNIT-II: Random variables:

Discrete and continuous – Distribution – Distribution function., expectation and covariance
Distribution - Binomial, Negative Binomial, Poisson, Uniform, Normal, exponential, geometric, Beta and Gamma distributions – related properties and computation of Mean and variance, Central limit theorem (without proof).

UNIT-III: Sampling distribution: [large sampe tests]

Definition of Population and sample - Sampling distributions of mean (known and unknown) proportions, sums and differences.

Estimation: Point estimation – interval estimation - Bayesian estimation.

UNIT-IV: Test of Hypothesis:[sample tests]

Means and proportions – Hypothesis concerning one and two means – Type I and Type II errors. One tail, two-tail tests calculation of P-Value .Tests of significance – Student's t-test, F-test, Z test., χ^2 goodness of fit .

UNIT-V: Curve fitting:

The method of least squares –Straight line, parabola, goodness of fit, power curve, exponential curve. Inferences based on the least squares estimations –

UNIT- VI: Correlation and Regression:

Coefficient of correlation –Regression Coefficient – the lines of regression – the rank correlation Curvilinear regression, multiple regressions for three variables– correlation for bivariate distributions.

UNIT-VII: Queuing Theory:

Introduction to queueing problem, poisson process, Arrival and departure distributions- Pure Birth and Death Process M/M/1 Model and Simple Problems.

UNIT-VIII: Stochastic Process:

Introduction to stochastic process- Markov process classification of states – Examples of Markov Chains, Stochastic matrix, limiting probabilities.

TEXT BOOKS:

1. Probability and statistics for engineers (Erwin Miller And John E. Freund), R A Johnson And C.B.Gupta.. 7th edition, Pearson Education / PHI.
2. Introduction to Probability and Statistics, 12th edition, W.Mendenhall, R.J.Beaver and B.M.Beaver, Thomson. (Indian edition).
3. Mathematical statistics by VK Kapoor & Guptha

4. OR by Manmohan & VK Kapoor & Guptha
5. Probability & Statistics by E Rukmangadachari, Pearson Edition

REFERENCE BOOKS:

1. Text book of Probability and Statistics Dr.Shahnaz Bathul, V.G.S.Publishers 2003.
2. Probability and Statistics in Engineering, 4th Edition, William W.Hines, Douglas C.Montgomery, David M.Goldman, Connie M.Borror, Wiley Student Edition.
3. Probability, Statistics and Queuing Theory, 2nd Edition, Trivedi, John Wiley and Sons
4. Introduction to Probability and Statistics, J.S.Milton, Jesse C.Arnold, 4th edition, TMH.
5. Probability, Statistics and Random Processes, Dr.K.Murugesan, P.Guruswamy, Anuradha Agencies, Deepthi Publications.

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MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech. IT II-Sem

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Object Oriented Programming Lab

Objectives:

- To make the student learn an object oriented way of solving problems.
- To teach the student to write programs in Java to solve the problems

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64MB RAM and 100 MB free disk space
- JDK Kit Recommended

Week1:

- a) Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.
- b) The Fibonacci sequence is defined by the following rule: The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

Week 2:

- a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.
- b) Write a Java program to multiply two given matrices.
- c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

Week 3:

- a) Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
- b) Write a Java program for sorting a given list of names in ascending order.
- c) Write a Java program to make frequency count of words in a given text.

Week 4:

- a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
- b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
- c) Write a Java program that displays the number of characters, lines and words in a text file.

Week 5:

- a) Write a Java program that:
 - i) Implements stack ADT.
 - ii) Converts infix expression into Postfix form
 - iii) Evaluates the postfix expression

Week 6:

- a) Develop an applet that displays a simple message.

- b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.

Week 7:

Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

Week 8:

- a) Write a Java program for handling mouse and key events.

Week 9:

- a) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.
 b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

Week 10:

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

Week 11:

- a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.
 b) Write a Java program that allows the user to draw lines, rectangles and ovals.

Week 12:

- a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides ().Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides () that shows the number of sides in the given geometrical figures.
 b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Jtable component.

Text Books:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Programming with Java,M.P.Bhave and S.A.Patekar,Pearson Education
3. Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited.
4. Introduction to programming with Java, J.Dean&R.Dean McGraw Hill education
5. Java Programming DS Malik,Cengage Learning,India Edition
6. Object Oriented Programming through Java,P.Radha Krishna, University Press
7. Essentials of Java Programming,Muthu.C,TMH
8. Advanced Programming in Java2, K.Somasundaram, Jaico
9. The Art, Philosophy and Science of OOP with java,R.Miller,R.Kasparian,SPD

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MALLA REDDY ENGINEERING COLLEGE

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II Year B.Tech. IT II-Sem

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Data Base Management Systems Lab

Objective: This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named “Roadway Travels” whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database “Roadway travel”. Students are expected to use “Mysql” database.

Roadway Travels

"Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad. The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations

Reservations & Cancellation:

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One passenger/ person can book many tickets (to his/her family). Cancellations are also directly handed at the booking office.

In the process of Computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets and Reservation and cancellation details. You should also develop query’s using SQL to retrieve the data from the database.

The above process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships
2. E-R Model
3. Relational Model
4. Normalization
5. Creating the database
6. Querying.

Students are supposed to work on these steps week wise and finally create a complete “Database system” to Roadway Travels. Examples are given at every experiment for guidance to students.

Experiment 1: E-R Model

Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example:

Entities:

2. BUS
3. Ticket
4. Passenger

Relationships:

1. Reservation
2. Cancellation

PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO (Bus Entity)

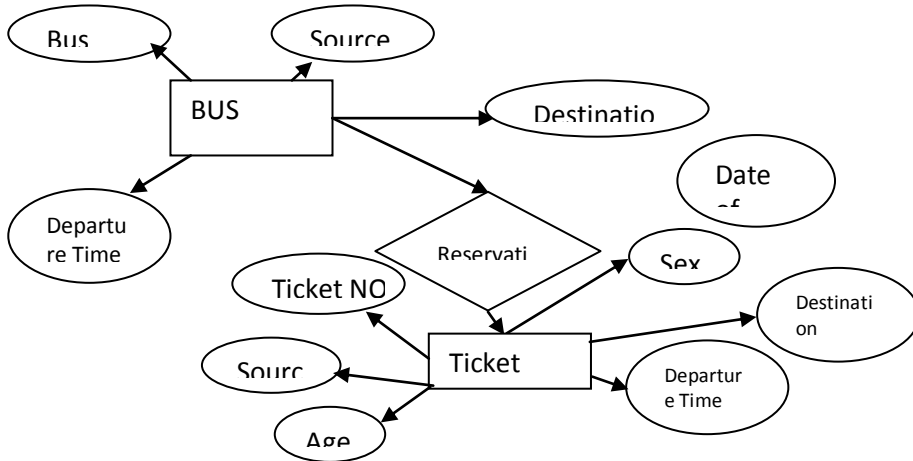
Apart from the above mentioned entities you can identify more. The above mentioned are few.

Note: The student is required to submit a document by writing the Entities and Keys to the lab teacher.

Experiment 2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.

Example: E-r diagram for bus



Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

Experiment 3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example: The passenger tables look as below. This is an example. You can add more attributes based on your E-R model. This is not a normalized table.

Passenger

| Name | Age | Sex | Address | Ticket ID | Passport ID |
|------|-----|-----|---------|-----------|-------------|
| | | | | | |
| | | | | | |

Note: The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

Experiment 4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute. Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.

Passenger

| Name | Age | Sex | Address | <u>Passport ID</u> |
|------|-----|-----|---------|--------------------|
| | | | | |
| | | | | |

| Passport ID | Ticket Id |
|-------------|-----------|
| | |
| | |

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

Experiment 5: Installation of Mysql and practicing DDL commands

Installation of MySQL. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases If not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

```
CREATE TABLE Passenger (
    Passport_id    INTEGER PRIMARY KEY,
    Name    VARCHAR (50) Not NULL,
    Age    Integer Not NULL,
```

Sex Char,
Address VARCHAR (50) Not NULL);
Similarly create all other tables.

Note: Detailed creation of tables is given at the end.

Experiment 6: Practicing DML commands

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for the records remain

Inserting values into Bus table:

Insert into Bus values (1234,'hyderabad', 'tirupathi');
Insert into Bus values (2345,'hyderabad', 'Banglore');
Insert into Bus values (23, 'hyderabad', 'Kolkata');
Insert into Bus values (45, 'Tirupathi', 'Bangalore');
Insert into Bus values (34, 'hyderabad', 'Chennai');

Inserting values into Bus table:

Insert into Passenger values (1, 45,'ramesh', 45,'M', 'abc123');
Insert into Passenger values (2, 78,'geetha', 36,'F', 'abc124');
Insert into Passenger values (45, 90, 'ram', 30, 'M', 'abc12');
Insert into Passenger values (67, 89, 'ravi', 50, 'M', 'abc14');
Insert into Passenger values (56, 22, 'seetha', 32, 'F', 'abc55');

Few more Examples of DML commands:

Select * from Bus; (selects all the attributes and display)
UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

Experiment 7: Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with 'A' and ends with 'H'.
5. Find the names of passengers whose age is between 30 and 45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names

Experiment 8 and Experiment 9: Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

1. Write a Query to display the Information present in the Passenger and cancellation tables.
Hint: Use UNION Operator.
2. Display the number of days in a week on which the 9W01 bus is available.
3. Find number of tickets booked for each PNR_no using GROUP BY CLAUSE.
Hint: Use GROUP BY on PNR_No.
4. Find the distinct PNR numbers that are present.

5. Find the number of tickets booked in each class where the number of seats is greater than 1.
Hint: Use GROUP BY, WHERE and HAVING CLAUSES.
6. Find the total number of cancelled seats.

Experiment 10: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Eg: CREATE TRIGGER updcheck BEFORE UPDATE ON passenger
FOR EACH ROW
BEGIN
IF NEW.TicketNO > 60 THEN
SET New.Ticket no = Ticket no;
ELSE
SET New.Ticketno = 0;
END IF;
END;

Experiment 11: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: CREATE PROCEDURE myProc()
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;
End;

Experiment 12: Cursors

In this week you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done

```
CREATE PROCEDURE myProc(in_customer_id INT)
BEGIN
DECLARE v_id INT;
DECLARE v_name VARCHAR(30);
DECLARE c1 CURSOR FOR SELECT stdId, stdFirstname FROM students WHERE
stdId=in_customer_id;
OPEN c1;
FETCH c1 into v_id, v_name;
Close c1;
END;
```

Tables

BUS

Bus No: Varchar: PK(Public key)
Source : Varchar
Destination : Varchar

Passenger

PPNO: Varchar(15) : PK
 Name: Varchar(15)
 Age : int (4)
 Sex:Char(10) : Male / Female
 Address: VarChar(20)

Passenger_Tickets

PPNO: Varchar(15): PK
 Ticker_No: Numeric(9)

Reservation

PNR_No: Numeric(9) : FK
 Journey_date : datetime(8)
 No_of_seats : int (8)
 Address : Varchar (50)
 Contact_No: Numeric (9) --> Should not be less than 9 and Should not accept any other character other than Integer
 Status: Char (2) : Yes / No

Cancellation

PNR_No: Numeric(9) : FK
 Journey_date : datetime(8)
 No_of_seats : int (8)
 Address : Varchar (50)
 Contact_No: Numeric (9) --> Should not be less than 9 and Should not accept any other character other than Integer
 Status: Char (2) : Yes / No

Ticket

Ticket_No: Numeric (9): PK
 Journey_date : datetime(8)
 Age : int (4)
 Sex:Char(10) : Male / Female
 Source : Varchar
 Destination : Varchar
 Dep_time : Varchar

Reference Books:

1. Introduction to SQL, Rick F.Vander Lans, Pearson education.
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova, Pearson education.
3. Oracle PL/SQL Programming,Steven Feuerstein,SPD.
4. SQL & PL/SQL for Oracle 10g,Black Book, Dr.P.S.Deshpande, Dream Tech.
5. Oracle Database 11g PL/SQL Programming, M.Mc Laughlin, TMH.
6. SQL Fundamentals, J.J.Patrick, Pearson Education.

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Automata and Compiler Design

UNIT-I

Formal Language and Regular Expressions: Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools.

UNIT-II

Context Free grammars and parsing : Context free grammars, derivation, parse trees, ambiguity LL(K)grammars and LL(1) parsing

UNIT-III

Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

UNIT-IV

Semantics: Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

UNIT-V

Context Sensitive features – Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNIT-VI

Run time storage: Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

UNIT-VII

Code optimization: Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

UNIT-VIII

Code generation: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

Text Books:

1. Introduction to Theory of computation.Sipser,2nd Edition,Thomson.
2. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

Reference Books:

1. Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Cengage learning.

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Linux Programming

UNIT - I

Linux Utilities - File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed - scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

UNIT – II

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT – III

Files: File Concept, File System Structure, Inodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, Kernel support for files, System calls, file descriptors, low level file access- File structured related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.

UNIT – IV

Process – Process concept, Kernel support for process, process attributes, process control – process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, Kill, raise, alarm, pause, abort, sleep functions.

UNIT – V

Interprocess Communication: Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC- message queues, semaphores and shared memory.

Message Queues- Kernel support for messages, Unix system V APIs for messages, client/server example.

UNIT – VI

Semaphores- Kernel support for semaphores, Unix System V APIs for semaphores.

Shared Memory- Kernel support for shared memory, Unix system V APIs for shared memory, semaphore and shared memory example.

UNIT – VII

Multithreaded Programming: Differences between threads and processes, Thread structure and uses, Threads and Light weight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, Thread Synchronization with Semaphores and with Mutexes, Example programs.

UNIT – VIII

Sockets: Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example- client/server programs.

Textbooks:

1. Unix System Programming using C++, T.Chan, PHI.(UNIT III TO UNIT VIII)
2. UNIX Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
3. Beginning Linux Programming, 4th Edition, N. Matthew, R.Stones, Wrox, Wiley India Edition.

Reference Books:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens,pearson education.
3. Unix Network Programming, W.R.Stevens,PHI.
4. UNIX for programmers and users, 3rd Edition, Graham Glass, King Ables,pearson education
5. UNIX and Shell programming, B.A.FOROUZAN and R.F.Gilberg, Cengage Learning.
6. UNIX the Text book, 2nd ediion, S.M.Sarwar, R.Koretsky, S.A.Sarwar, Pearson Education.
7. Unix Internals,U.Vahalia,Pearson Education.
8. Unix shell Programming,S.G.Kochan and P.Wood,3rd edition,Pearson Education.

Software Engineering

UNIT I:

Introduction to Software Engineering : The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNIT II:

Process models: The waterfall model, Incremental process models, Evolutionary process models, Specialized process models, The Unified process.

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT III:

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT IV:

Design Engineering: Design process and Design quality, Design concepts, the design model, pattern based software design.

Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design, assessing alternative architectural designs, mapping data flow into a software architecture.

UNIT V:

Modeling Component-level design: Designing class-based components, Conducting component-level design, Object constraint language, designing conventional components.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT VI:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT VII:

Metrics for Process and Products: Software Measurement, Metrics for software quality.

Risk management: Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

UNIT VIII:

Quality Management : Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

Text Books:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition, 2005.
2. Software Engineering- Ian Sommerville, 7th edition, Pearson education, 2004.

References Books:

1. Software Engineering- A Precise Approach, Pankaj Jalote, Wiley India, 2010
2. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005
3. Software Engineering1: Abstraction and Modelling, Diner Bjorner, Springer International Edition, 2006
4. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International Edition, 2006
5. Software Engineering Foundations, Yingxu Wang, Auerbach Publication, 2008
6. Software Engineering Principles and practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
7. Software Engineering3: Domains, Requirements and Software Design, Diner Bjorner, Springer International edition.
8. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley & Sons.
9. Software Engineering: A Primer, Waman S Jawadkar, The McGraw-Hill Companies.
10. Introduction to Software Engineering, R.J. Leach, CRC Press.

Operating Systems

UNIT I:

Operating Systems Overview: operating systems functions ,Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating systems structures - operating system services and systems calls, system Programs, operating system structure, operating systems generation.

UNIT II:

Process Management – Process concepts, threads, scheduling-criteria, algorithms, their evaluation. Thread scheduling, case studies UNIX, Linux, Windows

UNIT III:

Concurrency: Process synchronization, the critical- section problem, Peterson’s Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Linux, and Windows

UNIT IV:

Memory Management : Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement, algorithms, Allocation of Frames, Thrashing case studies UNIX, Linux, Windows.

UNIT V:

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

UNIT VI:

File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

File System implementation- File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows

UNIT VII:

Mass-storage structure: overview of Mass-storage structure, Disk structure, disk attachment disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

I/O systems- Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests Hardware operation, STREAMS, performance.

UNIT VIII:

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection,

Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, fire walling to protect systems and networks, computer –security classifications, case studies UNIX, Linux, Windows.

Text Books:

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, John Wiley.
2. Operating systems- A Concept based Approach-D.M.Dhamdhere, 2nd Edition, TMH

References Books:

1. Operating Systems’ – Internal and Design Principles Stallings, Sixth Edition–2009, Pearson education/Pearson education
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition PHI.
3. Principles of Operating Systems, B.L.Stuart,Cengage learning, India Edition.
4. Operating Systems,A.S.Godbole,2nd Edition, TMH.
5. An Introduction to Operating Systems, P.C.P.Bhatt, PHI.
6. Operating Systems, G.Nutt, N.Chaki and S.Neogy,3rd Edition, Pearson Edition.
7. Operating Systems, R.Elmasri, A.G.Carrick and D.Levine, Mc Graw Hill.
8. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.

Computer Networks

UNIT –I

Introduction to networks, internet, protocols and standards, the OSI model, layers in OSI model, TCP/IP suite, Addressing, Analog and digital signals

UNIT-II

Physical Layer: Digital Transmission, multiplexing, transmission media, circuit switched networks, Datagram networks, virtual circuit networks, switch and telephone network.

UNIT-III

Data link layer: Introduction, Block coding, cyclic codes, checksum, framing, flow and error control, Noiseless channels, noisy channels, HDLC, point to point protocols.

UNIT-IV

Medium Access sub layer: Random access, controlled access, channelization, IEEE standards, Ethernet, Fast Ethernet, Giga-Bit Ethernet, wireless LANs.

UNIT-V

Connecting LANs, backbone networks and virtual LANs, Wireless WANs, SONET, frame relay and ATM.

UNIT –VI

Network Layer: logical addressing, internetworking, tunneling, address mapping, ICMP, IGMP, forwarding, uni-cast routing protocols, multicast routing protocols.

UNIT –VII

Transport Layer: Process to process delivery, UDP and TCP protocols, SCTP, data traffic, congestion, congestion control, QoS, integrated services, differentiated services, QoS in switched networks.

UNIT –VIII

Application Layer –Domain name space, DNS in internet, electronic Mail, FTP, WWW, HTTP, SNMP, multi-media, network security.

Text Books:

1. Data Communications and Networking – BehrouzA. Forouzan. Fourth Edition TMH, 2006.
2. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education.

References Books:

1. An Engineering Approach to Computer Networks-S.Keshav,2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W.A.Shay, Cengage Learning.
3. Computer and Communication Networks Nader F. Mir, Pearson Education.
4. Computer Networking: A Top-Down Approach Featuring the internet, James F.Kurose, K.W.Ross, 3rd Edition, Pearson Education.
5. Data and Computer Communications, G.S.Hura and M.Singhal, CRC Press, Taylor and Francis Group.
6. Data communications and computer Networks, P.C.Gupta, PHI.

Management Science

UNIT – I: Introduction to Management: Entrepreneurship and organization- nature, importance and Functions of Management, Taylor’s Scientific Management Theory, Fayol’s Principles of Management, Maslow’s Theory of Human Needs, Douglas McGregor’s Theory X and Theory Y, Herzberg’s Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

UNIT – II: Designing Organisational Structures : Departmentation and Decentralisation, Types of organisation structures.Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organisation, Cellular Organisation, team structure, boundaryless organization, inverted pyramid structure, lean and flat organization structure and their merits, demerits and suitability.

UNIT – III: Operations Management : Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement- Statistical Quality Control: \bar{X} chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling, Deming’s contribution to quality.

UNIT – IV: A) Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records-Supply chain management.

B) Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution

UNIT – V: Human Resources Management (HRM) : Evolution of HRM, Concepts of HRM, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

UNIT – VI: Project Management (PERT/CPM) : Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (Simple problems)

UNIT – VII: Strategic Management : Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives.

UNIT – VIII: Contemporary Management Practices : Basic concepts of Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Value chain Analysis, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering 5S Model, Deming’s PDCA, Kaizen, Poka – Yoke, Muda, Bench Marking, Balanced Score Card.

Text Books:

1. Aryasri : *Management Science*, TMH , New Delhi, 2009.

References Books:

1. Stoner, Freeman, Gilbert, *Management*, 6th Ed, Pearson Education, New Delhi, 2004.
2. Kotler Philip & Keller Kevin Lane: *Marketing Mangement* 12/e, PHI, 2005
3. Koontz & Weihrich: *Essentials of Management*, 6/e, TMH, 2005
4. Thomas N.Duening & John M.Ivancevich *Management — Principles and Guidelines*, Biztantra,2003.
5. Kanishka Bedi, *Production and Operations Management*, Oxford University Press, 2004.
6. Memoria & S.V.Gauker, *Personnel Management*, Himalaya, 25/e, 2005
7. Schermerhorn, Capling, Poole & Wiesner: *Management*, Wiley, 2002.
8. Parnell: *Strategic Management*, Biztantra,2003.
9. L.S.Srinath: *PERT/CPM*,Affiliated East-West Press, 2005.
10. William J.Stevenson & ceyhun Ozgur :*Introduction to Management Science*,TMH,2007.

Pre-requisites: Managerial Economics

Objective: To familiarize with the process of management and to provide basic insight into select contemporary management practices.

Codes/Table: Normal Distribution Function Table need to be permitted into the examination Hall.

Question Paper Pattern: 5 Questions to be answered out of 8 questions. The question paper should contain at least 2 practical problems, one each from units – III & IV.

Each question should not have more than 3 bits.

Unit VIII will have only short questions, not essay questions.

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Advanced English Communication Skills Lab**1. Introduction**

The introduction of the English language lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to hone further their listening, reading, speaking and writing skills in English both for their professional and interpersonal communication in the globalised context. It is also essential for them to understand how effective communication is connected with the personality of a person and thus understand the role of soft skills.

The proposed course should be an integrated theory and lab course to enable students to use good English and perform the following:

- Gather ideas and information, to organize ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research/technical reports.
- Write essays.
- Make oral presentation.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. Objectives:

This lab focuses on using computer-aided multimedia instructions for language development to meet the following targets:

- To improve the students “fluency in English, through a well developed vocabulary and then to listen to English spoken at normal conventional speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

3. Syllabus;

The following course content is prescribed for the advanced communication Skills Lab:

Unit I

Vocabulary building-synonyms and antonyms, word roots, one word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.

Unit II

Reading skills –types of reading–reading for facts, guessing meaning from context, strategies of reading- scanning, skimming, inferring meaning, critical reading.

Unit III

Technical Report Writing-types of formats and styles, subject matter organization, clarity, coherence and style, planning, data –collection, tools analysis.

Unit IV

Resume' writing-structure and presentation, planning defining the career objective, projecting ones strengths and skills set, summary, formats and styles, cover letter-writing.

Unit V

Writing and composition skills

Warm up activities- (expansion, condensation and paragraph building) , sequencing the ideas, three "C"s in writing, complete, comprehensive, and clear, Statement Of Purpose writing, e-correspondence.

Unit VI

Group Discussions

Warm up activities –(brain storming, ideation) dynamics of group discussions, interventions, summarizing, modulation of voice, body language, relevance, fluency and coherence.

Unit VII

Presentation Skills—

Warm up activities- (writing abstracts, synopsis etc.) types of presentations, graphical representation, making power point presentations, audio—video – Assessment.

Unit VIII

Interview Skills- concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.

note: unit VI and VIII are for internal examination.

4. Minimum Requirement:

The English language lab shall have two parts:

1. **The computer aided language lab** for 60 students with 60 systems, one master console, LAN Facility and English language software for self-study by learner's
2. **The communication skills lab** with movable chairs and audio-visual aids with a P.A system. a TV., a digital stereo-audio video system and camcorder etc

System Requirements (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with following specifications:

- a) P-IV Processor
- b) Speed-2.8 GHZ
- c) Ram-512mb
- d) Hard Disk-80-Gb
- e) Head phones of high quality

5.suggested software:

The software consisting of the prescribed topics above should be procured and used.

Suggested software:

- Clarity pronunciation power-Part II
 - Oxford Advanced learner's compass, 7th Edition.
 - DELTA's key to the Next Generation TOFEL Test: Advanced Skills Practice. Lingua TOFEL CBT Insider, by Dreamtech
 - TOFEL &GRE (KAPLAN,AARCO&BARRONS,USA,Cracking GRE by CLIFFS)
 - The following software from train2success.com
- Preparing for being interviewed,

- Positive thinking,
- Interviewing Skills, Telephone Skills,
- Time management,
- Team building,
- Decision making,

English In Mind, Herbert Puchat and Jeff Stranks with Meredith Levy, Cambridge.

6. Books Recommended

Prescribed lab manual cum record

1. Advanced Communication Skills Laboratory Manual : Sudha Rani. D. Pearson Publications, New Delhi,2011.

References:

1. **Effective Technical Communication:** M.Asharf Rizvi. Tata McGraw-Hill Publishing Company ltd.
2. **A course On English Communication** By Madhavi Apte, Prentice-Hall Of India,2007
3. **Communication Skills** By Leene Sen, Prentice-Hall Of India,2005.
4. **Academic Writing-A Practical Guide for Students** By Stephen Bailey, Rontledge Flamer, London &Newyork, 2004.
5. **English Language Communication:** A reader Cum Lab Manual Dr. A Rama Krishna Rao , Dr. G.Natanam & Prof SA Sankaranarayana, Anuradha Publications, Chennai.
6. **Body Language-Youre Success Mantra** By Dr. Shalini Verma, S.Chand,2006.
7. **Delta's Key To The Next Generation TOFEL Test:** Advanced Skills Practice: New Age International (P) Ltd, Publishers, Newdelhi.
8. **Books On TOFEL/GRE/GMAT/CAT** By Barron's/Cup
9. **IELTS Series With CDS** By Cambridge University Press.
10. **Technical Report Writhing Today** By Daneial G. Riordan & Steven E. Paule, Biztantra Publishers,2005
11. **Basic Communication Skill For Technology** Byandra J. Rutherford, 2nd Edition ,Pearson Education,2007
12. **Communication Skills For Engineers** By Sunitha Mishara & C. Muralikrishna, Pearson Education,2007
13. **Objective English** By Edgar Thorpe & Shopwick Thorpe, 2nd Edition, Pearson Education,2007.
14. **Cambridge Preparation For The TOFEL Test** By Jolene Gear & Robert Gear, 4th Edition
15. Technical Communication by Meennakhi Raman & Sangeeta Sharma, Oxford University Press.

Distribution and weight of marks:

Advanced English communication skills lab Practical:

1. The practical's examinations for the English language laboratory practice shall be conducted as per the university norms prescribed for the core engineering practical sessions.
2. For the English language lab sessions there shall be a continuous evolution during the year for 25 session marks and 50 end examination marks. Of the 25 marks, 15 marks shall be awarded for day-to day work and 10 marks to be awarded by conducting internal lab test(s).the end examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

Operating Systems& Computer Networks Lab
(Through Linux)**Objective:**

- To Understand the functionalities of various layers of OSI model
- To understand the operating System functionalities **System/ Software Requirement**
- Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space

Computer Networks Lab:**Part - A**

1. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.
3. Implement Dijkstra's algorithm to compute the Shortest path thru a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm
5. Take an example subnet of hosts . Obtain broadcast tree for it.
6. Take a 64 bit playing text and encrypt the same using DES algorithm .
7. Write a program to break the above DES coding
8. Using RSA algorithm Encrypt a text data and Decrypt the same .

Part -B**Operating Systems Lab:**

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU Etc.
8. Simulate Paging Technique of memory management.

Problems on Linux Programming:

- Note: Use Bash for Shell scripts.
1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
 2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
 3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a C program that makes a copy of a file using standard I/O and system calls.
11. Implement in C the following Unix commands using System calls
a) cat b) mv
12. Write a C program to list directory files in a directory.
13. Write a C program to emulate the Unix ls -l command.
14. Write a C program to list for every file in a directory, its inode number and file name.
15. Write a C program that redirects standard output to a file.Ex: ls > f1.
16. Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.
17. Write a C program to create a Zombie process.
18. Write a C program that illustrates how an orphan is created.
19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls -l | sort
20. Write C programs that illustrate communication between two unrelated processes using named pipe.
21. Write a C program in which a parent writes a message to a pipe and the child reads the message.
22. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
23. Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (22)) and displays them.
24. Write C programs to transfer a large amount of data between processes, using
a) a pipe b)a FIFO c)a message queue.

Reference Books:

1. Advanced Unix Programming, N.B.Venkateswarulu, BS Publications.
2. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education, 2005.
4. Unix Shells by Example, 4th Edition, Elllie Quigley, Pearson Education.
5. Sed and Awk, O.Dougherty&A.Robbins,2nd edition,SPD.

Web Technologies

UNIT-I:

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;

UNIT-II:

Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

UNIT-III:

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT-IV:

Java Beans: Introduction to Java Beans, Advantages of Java Beans, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's.

UNIT-V:

Web Servers and Servlets: Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT-VI:

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat.

UNIT-VII:

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations.

UNIT VIII:

Database Access: Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework..

Text Books:

1. Programming world wide web-Sebesta,Pearson
2. Java The complete Reference 7th Edition Herbert Schildt. TMH
3. Core Servlets and Java Server Pages Volume 1: Core Technologies By Marty Hall and Larry Brown Pearson(UNITs 5,6,7,8)

Reference Books:

1. Web Programming building internet Applications,Chris Bates 2nd Edition,WILEY DreamTech.
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
3. Jakarta Struts Cookbook, Bill Siggelkow, S P D O'Reilly for chap 8.
4. Murach's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to web Design and Programming –Wang-Thomson
6. Web Applications Technologies Concepts-Knuckles,John Wiley
7. Programming world wide web-Sebesta,Pearson
8. Web Warrior Guide to Web Programming-Bai/Ekedaw-Thomas
9. Beginning Web Programming-Jon Duckett WROX.
10. Java Server Pages, Pekowsky, Pearson.

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Operations Research
(Open Elective)

UNIT- I: Introduction to operations research:

Basic Definitions of OR, scope, objectives, phases, models and limitations of linear programming problem formulation of LPP, dual LPP, Graphical Method of solving LPP.

UNIT- II: Solutions of LPP:

Simplex method, artificial variables, two-phase method, Big-M method, , degeneracy and unbounded solutions.

UNIT- III: Transportation problem:

Formulation, solution, unbalanced transportation problem. Finding basic feasible solutions- northwest corner rule, least cost method, and Vogel's approximation method. Optimality test: The stepping stone method and MODI method.

Assignment model: Formulation, Row-column minima method, Hungarian method for optimal solution. Solving unbalanced assignment problem. Traveling salesman Problem .

UNIT – IV: Sequencing models:

Solution of Sequencing Problem- Processing n jobs through 2 Machines- Processing n jobs through 3 Machines- Processing 2 jobs through m Machines- Processing n jobs through m Machines. Jhonson's algorithm and problems

UNIT- V: Dynamic Programming:

Characteristics of dynamic programming. Bellman's principle of optimality Dynamic programming approach for Priority Management employment smoothening, capital budgeting, stage .coach / Shortest path, cargo loading and reliability problems

UNIT – VI: Game Theory:

Competitive games rectangular game , saddle point, minimax (maxmin) method of Optimal strategies,value of the game.Solution of games with saddle points, dominance principle.Rectangle games without saddle point-mixed strategy for 2x2 games, solving game theory problem by L.P.P.

UNIT-VII: Replacement Models:

Replacement of Items that deteriorate whose maintenance costs increase with time without change in the money value. Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

Unit – VIII: Inventory Models:

Inventory models, ABC(all better control)analysis , Inventory costs. Models with deterministic demand- model (a) demand rate uniform and infinite,model (b) demand rate non-uniform and production rate infinite ,model (c) demand rate uniform and production rate finite,

TEXT BOOKS:

1. P. Sankara Iyer, "Operations Research", Tata McGraw – Hill, 2008.
2. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, "Operations Research", Pearson Education, 2005.
3. J.K. Sharma Operations research.

REFERENCE BOOKS:

1. S D Sharma., "Operations Research Theory & Applications, 3e", Mc.Millan India Ltd, 2007.
2. P. K. Gupta and D. S. Hira, "Operations Research", S.Chand & co., 2007.
3. N.V.S. Raju, "Operations Research", HI-TECH, 2002
4. Panneerselvam, "Operations Research", PHI-2e, 2006, rp2008.
5. Operations Research, Ravindran, Phillips,Solberg, 2nd edition,Wiley India.
6. F. S. Hillier, G.j. Lieberman, "Introduction to Operations Research – 8ed", Tata McGraw-Hill,2005,rp2007.
7. Billy E. Gillett, "Introduction to Operations Research- A Computer-Oriented Algorithmic Approach", Tata McGraw-Hill, 1979, rp2004
8. THAHA operations research

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Intellectual Property -Rights & Cyber Law
 (Open Elective)

UNIT – I: Introduction to Intellectual Property, Law of Trademarks, Trademark selection & searching: IP Law –Types of IP –Agencies for IP Registration –International Treaties . Purpose and Function of Trademarks – Types of marks - Acquisition of Trademark Rights – Categories of marks – trade names and Business names – protectable matter. Selection and evaluation of a mark – Trademark search.

UNIT – II

Trademark registration process, post –registration Procedures, trademark maintenance, Transfer of Rights to marks: preparing and Filing the application – docketing Critical Dates – Examination process - post – examination Procedure-Registration. Affidavit of Continued Use-Affidavit of incontestability-renewal of Registrations- Docketing Requirements- Loss of Trademark Rights – Trademark use and compliance policies-Trademark policing and maintenance-use of Marks Owned by Third Parties – Transfer of Ownership or Right in Trademarks.

UNIT - III

Inter partes Proceedings, Infringement, Dilution, New Developments in Trademarks Law: Inter Partes Proceedings – Infringement of Trademarks- Dilution of Trademarks-Related Trademark claims. protecting a Domain Name –Other Cyberspace Trademark issues.

UNIT – IV

Law of copyright, Subject Matter of Copy right, Right Afforded by copyright Law: Foundations of copyright law-Originality of material – Fixation of Material – Exclusion from copyright protection –compilations, collections, and Derivative works. Right of Reproduction – Right to prepare derivative works. Rights of Distribution – Rights to Perform the work publicly-Right to Display the Work publicly- limitations on exclusive Rights.

UNIT – V

Copyright Ownership, Transfers, Duration, Registration, and searching: Copyright Ownership issues-joint works-Ownership in Derivative works-works made for hire – Transfers of Copyright-Termination of Transfers of Copy right –Duration of copyright. copyright registration application - Deposit Materials - Application Process and Registration of Copyright-Searching Copyright Office Records and Deposit Materials-copyright Notice.

UNIT – VI

Copyright Infringement, New Developments in Copyright Law, semiconductor Chip protection Act: Elements of Infringement-contributory Infringement and vicarious Infringement-Defenses to Infringement- Infringement Actions-Remedies for Infringement. Copyright protection for Computer Programs-copyright protection for Automated Databases-copyright in the Electronic Age-The Digital Millennium Copyright Act-Recent Development in Copyright Law-Terms of the Trade-Vessel Hull Protection-Semiconductor Chip Protection.

UNIT – VII

Law of patents, patent searches, Ownership, Transfer: patentability-Design patents-Double patenting-patent searching-patent application process-prosecuting the application, post – issuance Actions, term and Maintenance of patents. Ownership Rights-sole and joint Inventors-Disputes over Inventorship-inventions made by employees and independent contractors-Assignment of patent Rights-Licensing of patent Rights-Invention Developers and promoters.

UNIT – VIII

Patent Infringement, new developments and International patent law: Direct Infringement-inducement to Infringe – Contributory Infringement –First scale Doctrine-Claims Interpretation –defenses to Infringement-remedies for Infringement-Resolving an Infringement dispute-patent Infringement Litigation. New Developments in patent Law - International patent protection – paris Convention – patent cooperation Treaty- agreement on Trade Related Aspects of Intellectual property Rights-patent Law Treaty.

Text Book:

1. Intellectual Property Rights by Deborah E. Bouchoux, Cengage Learning.

Reference Books:

1. Managing Intellectual Property – The Strategic Imperative, Second Edition by Vinod V. Sople, PHI Learning Private Limited.
2. Intellectual Property - Copyrights, Trademarks, and Patents by Richard Stim, Cengage Learning.

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Computer Forensics
(Open Elective)

UNIT-I

Computer Forensics Fundamentals: What is computer Forensics?, Use of computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists.

Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement- Computer Forensic Technology- Types of Business Computer Forensic Technology.

UNIT-II

Computer Forensics Evidence and Capture: Data recovery Defined- Data Back-up and Recovery- The Role of Back-up in Data Recovery- The Data Recovery Solution.

Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options – Obstacles – Types of Evidence – The Rules of Evidence – Volatile Evidence – General Procedure – Collection and Archiving – Methods of Collection – Artifacts – Collection Steps – Controlling Contamination: The Chain of Custody.

UNIT-III

Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps – Legal Aspects of Collecting and Preserving Computer Forensic Evidence.

Computer Image Verification and Authentication: Special needs of Evidential Authentication – Practical Consideration – Practical Implementation.

UNIT – IV

Computer Forensic analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data – hiding techniques, performing remote acquisitions.

Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics; using network tools, examining the honeynet project.

UNIT – V

Processing Crime and Incident Scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case.

UNIT – VI

Current Computer Forensic tools: evaluating computer forensic tool needs, computer forensic software tools, computer forensic hardware tools, validating and testing forensics software.

UNIT – VII

E – Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

UNIT – VIII

Working with Windows and DOS Systems: understanding file systems, exploring Microsoft File Structures, Examining NTFS disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS startup tasks, virtual machines.

Text Books:

1. Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
2. Computer Forensics and Investigations by Nelson, Phillips Einfinger, Steuart, CENGAGE Learning

Reference Books:

1. Real Digital Forensics by Keith J. Jones, Richard Bejtlich, Curtis W. Rose, Addison – Wesley Pearson Education
2. Forensic Compiling. A Tractitioneris Guide by Tony Sammes and Brain Jenkinson, Springer International edition.
3. Computer Evidence Collection & Presentation by Christopher L.T.Brown, Firewall Media.
4. Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media.
5. Software Forensics Collecting Evidence from the scene of a Digital Crime by Robert M.Slade, TMH 2005
6. Windows Forensics by Chad Steel, Wiley India Edition.

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Network Security

UNIT-I:

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT-II:

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC,

UNIT-III:

Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

UNIT-IV:

Email privacy: Pretty Good Privacy (PGP) and S/MIME,.

UNIT-V:

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT-VI:

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET)

UNIT-VII:

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.
Intruders, Viruses and related threats

UNIT-VIII:

Firewall Design principles, Trusted Systems, Intrusion Detection Systems

Text Books:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeh, wiley Dreamtech.

Reference Books:

1. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Centage Learning.
5. Cryptography and network Security, B.A.Forouzan, D.Mukhopadhyay, 2nd edition, TMH.
6. Introduction to Cryptography, Buchmann, Springer.
7. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
8. Information Systems Security, Godbole, Wiley Student Edition.
9. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH.

Computer Graphics**UNIT I:**

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices (p.nos 22-90 of text book-1).

UNIT II:

Output primitives : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms (p.nos 103-123,137- 145,147-150,164-171 of text book-1, p.nos. 72-99 of text book-2).

UNIT III:

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. (p.nos 204-227 of text book-1).

UNIT IV:

2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm(p.nos 237-249,257-261 of text book -1, p.nos. 111-126 of text book-2).

UNIT V:

3-D object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods. (p.nos 324-331,340-342, 347-364, 516-531, 542-546 of text book-1, p.nos 473-529,721-739 of text book-2).

UNIT VI:

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping (p.nos 427-443, 452-481 of text book -1).

UNIT VII:

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods(p.nos 489-505 of text book -1, Chapter 15 of of text book-2).

UNIT VIII:

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications. (p.nos 604-616 of text book -1, chapter 21 of text book-2).

Text Books:

1. “Computer Graphics C version”, Donald Hearn and M.Pauline Baker, Pearson Education.
2. “Computer Graphics Principles & practice”, second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

References:

1. “Computer Graphics Second edition”, Zhigand xiang, Roy Plastock, Schaum’s outlines, Tata Mc- Graw hill edition.
2. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
3. “Principles of Interactive Computer Graphics”, Neuman and Sproul, TMH.
4. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
5. Computer Graphics, Steven Harrington, TMH
6. “Computer Graphics”, F.S.Hill, S.M.Kelley,PHI.
7. Computer Graphics , P.Shirley, Steve Marschner & Others, Cengage Learning.
8. Computer Graphics & Animation, M.C.Trivedi, Jaico Publishing House.
9. An Intergraded Introduction to Computer Graphics and Geometric Modelling, R.Goldman, CRC Press, Taylor & Francis Group.
10. Computer Graphics, Rajesh K. Maurya, Wiley India.

Data Warehousing and Data Mining

UNIT - I

Introduction : Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse system, Major issues in Data Mining.

Data Preprocessing: Needs for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT - II

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of Data cube and OLAP Technology, Attribute-Oriented Induction.

UNIT - III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT - IV

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule Based Classification, Classification by Back propagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods.

UNIT - V

Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Clustering High Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.

UNIT - VI

Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data. Graph Mining, Social Network Analysis and Multirelational Data Mining.

UNIT - VII

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

UNIT - VIII

Applications and Trends in Data Mining: Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining and Social Impacts of Data Mining.

Text Books:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2nd Edition, 2006.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

References Books:

1. Data Mining Techniques – ARUN K PUJARI, 2nd edition, Universities Press.
2. Data Warehousing in the Real World – Sam Anahory & Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining, K.P.Soman, S. Diwakar, V. Ajay, PHI, 2008.
4. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley Student Edition.
5. The Data Warehouse Life cycle Tool kit – Ralph Kimball Wiley Student Edition.
6. Building the Data Warehouse by William H Inmon, John Wiley & Sons Inc, 2005.
7. Data Mining Introductory and advanced topics – Margaret H Dunham, Pearson Education.
8. Data Mining, V.Pudi And P. Radha Krishna, Oxford University Press.
9. Data Mining: Methods and Techniques, A.B.M Shawkat Ali and S.A. Wasimi, Cengage Learning.
10. Data Warehouse 2.0, The Architecture for the next generation of Data Warehousing, W.H. Inmon, D. Strauss, G. Neushloss, Elsevier, Distributed by SPD.

Embedded Systems**Unit - I**

Embedded Computing: Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. (**Chapter I from Text Book 1, Wolf**).

Unit - II

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input / Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input / Output, Interrupts. (**Chapter 3 from Text Book 2, Ayala**).

Unit - III

Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions. (**Chapters 4, 5 and 6 from Text Book 2, Ayala**).

Unit - IV

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts. (**Chapter 7 and 8 from Text Book 2, Ayala**)

Unit - V

Applications: Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. (**Chapter 10 and 11 from Text Book 2, Ayala**).

Unit - VI

Introduction to Real – Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. (**Chapter 6 and 7 from Text Book 3, Simon**).

Unit - VII

Basic Design Using a Real-Time Operating System : Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

Unit - VIII

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. (**Chapter 8 from Text Book 1, Wolf**).

Text Books:

1. Computers and Components, Wayne Wolf, Elsevier.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.

Reference Books:

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

III Year B.Tech. IT II-Sem

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Embedded Systems and Data Mining Lab

Embedded Systems Lab:

(Using 89c51 SDK (Software Development Kit))

EXP 1. Write a program to

- a) Read inputs from switches from 89c51 SDK
- b) And blink the LED's in different patterns in 89c51 SDK .

EXP 2. Write a Program for serial Communication between Microcontrollers to PC vice versa

- For Microcontroller to PC communication the data should be transferred from microcontroller to PC Terminal window.
- For PC to microcontroller communication the data should be transferred from PC terminal window to Microcontroller LCD display.

EXP 3. Write a Program for Encryption and Decryption.

- Use 4x3 keyboard interface (for enter data)
- Use LCD interface (display data)
- Use serial Communication (display data at PC terminal window)

EXP 4. Develop necessary interfacing circuit to read data from a temperature sensor and process using 89c51 SDK, the data has to be displayed on a PC Terminal window.**EXP 5.** Sort RTOS on to 89c51 Microcontroller and verify.

- Run 2 to 3 tasks simultaneously on 89c51 SDK
- Use LCD interface ,LED interface, Serial communication.

EXP 6. Write a program to read input from switches display the switch number in seven segment display and Develop necessary interfacing circuit to process display . (example : if we press switch 1 it should display 1 on the seven segment display)**EXP 7.** Write a program to read input from switches and turn on bulb which can works With 230 V AC using relay interface , develop necessary interfacing circuit for 89c52SDK. (example : if we press switch 1 it should turn on bulb 1 vice versa)**EXP 8.** Write a program to display Real time Clock on SEVEN SEGMENT DISPLAY and Develop necessary interfacing circuit to process TIME display .**EXP 9.** Write a program to implement calculator which can execute basic operations such as addition , subtraction, multiplication and division and develop necessary interfacing circuit for process the operations with 89c52 SDK.

- Use Keyboard Interface (for read input from user)
- Use 2-line LCD Interface (for display the input and display the output)

REFERENCES:

- 1) KVKKF Prasad : Embedded /Real-Time Systems , Dreamtech,Press.
- 2) The 8051 micro controller & Embedded Systems using assembly and C By Kenneth J.Ayala Dhananjay V.Gadre

Data Mining Lab: Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the bank's profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- foreign_worker. There are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

Subtasks : (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment ? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly ? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy ?
5. Is testing on the training set as you did above a good idea ? Why or Why not ?
6. One approach for solving the problem encountered in the previous question is using cross-validation ? Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease ? Why ? (10 marks)

7. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)
9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?
11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?
12. (Extra Credit): How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules. PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR.

Task Resources: Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
 - Introduction to Weka (html version) (download ppt version)
 - Download Weka
 - Weka Tutorial
 - ARFF format
 - Using Weka from command line

Objective :

To create a fully functional website with mvc architecture. To Develop an online Book store using we can sell books (Ex amazon .com).

Hardware and Software required:

1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must be also be installed

Week-1:

Design the following static web pages required for an online book store web site.

1) **HOME PAGE:**

The static home page must contain three **frames**.

Top frame: Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame: At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link “**IT**” the catalogue for **IT** Books should be displayed in the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

| | | | | |
|---------------------------|-----------------------------|--------------|-----------|------|
| Logo | Web Site Name | | | |
| Home | Login | Registration | Catalogue | Cart |
| IT ECE EEE CIVIL | Description of the Web Site | | | |

Fig 1.1

2) LOGIN PAGE:

This page looks like below:


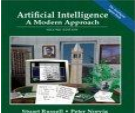


| | | | | |
|---------------------------|------------------------------|---------------------------------------|--------------------------------------|------|
| Logo | Web Site Name | | | |
| Home | Login | Registration | Catalogue | Cart |
| IT ECE EEE CIVIL | Login : <input type="text"/> | | <input type="text"/> | |
| | | Password: <input type="text"/> | | |
| | | <input type="button" value="Submit"/> | <input type="button" value="Reset"/> | |

3) CATALOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.

The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

| | | | | |
|-------|---|--|------------------|--|
| Logo | Web Site Name | | | |
| Home | Login | Registration | Catalogue | Cart |
| IT |  | Book : XML Bible Author : Winston Publication : Wiely | \$ 40.5 | <input type="button" value="Add to cart"/> |
| ECE | | | | |
| EEE |  | Book : AI Author : S.Russel Publication : Princeton hall | \$ 63 | <input type="button" value="Add to cart"/> |
| CIVIL |  | Book : Java 2 Author : Watson Publication : BPB publications | \$ 35.5 | <input type="button" value="Add to cart"/> |
| |  | Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication | \$ 50 | <input type="button" value="Add to cart"/> |

Note: Week 2 contains the remaining pages and their description.

Week-2:

4) CART PAGE:

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

| | | | | |
|-----------------------|------------------|--------------|-----------------|----------------|
| Logo | Web Site Name | | | |
| Home | Login | Registration | Catalogue | Cart |
| IT | Book name | Price | Quantity | Amount |
| ECE | Java 2 | \$35.5 | 2 | \$70 |
| EEE | XML bible | \$40.5 | 1 | \$40.5 |
| CIVIL | | | | |
| Total amount - | | | | \$130.5 |

5) REGISTRATION PAGE:

Create a "registration form" with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

WEEK 3:

VALIDATION:

Write *JavaScript* to validate the following fields of the above registration page.

1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

Week-4:

Design a web page using **CSS (Cascading Style Sheets)** which includes the following:

- 1) Use different font, styles:

In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles.

For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-decoration:underline}
</style>

</HEAD>

<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}

For example:

<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink {cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
<b class="headline">This is headline style bold</b>
</BODY>

</HTML>
```

2) Set a background image for both the page and single elements on the page.

You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif);.gif};
```

3) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat

Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

4) Define styles for links as

```
A:link
A:visited
A:active
A:hover
```

Example:

```
<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline; color: red;}
</style>
```

5) Work with layers:

For example:

LAYER 1 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-
```

LAYER 2 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
```

```
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-
```

```
index:4">LAYER2</div>
```

```
index:4">LAYER 2</div>
```

6) Add a customized cursor:

```
Selector {cursor:value}
```

For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink {cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

Week-5:

Write an XML file which will display the Book information which includes the following:

- 1) Title of the book
- 2) Author Name
- 3) ISBN number
- 4) Publisher name
- 5) Edition
- 6) Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.

Hint: You can use some xml editors like XML-spy

Week-6:

VISUAL BEANS:

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the “property window “.

Week-7:

- 1) Install TOMCAT web server and APACHE.

While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

- 2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.

Access the pages by using the urls :

<http://localhost:4040/rama/books.html> (for tomcat)

<http://localhost:8080/books.html> (for Apache)

Week-8:

User Authentication :

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display “ You are not an authenticated user “.

Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Week-9:

Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

Week-10:

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

Week-11:

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount)) of each category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

Week-12:

HTTP is a stateless protocol. Session is required to maintain the state.

The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate()).

Modify your catalogue and cart JSP pages to achieve the above mentioned functionality using sessions.