UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: UNIX & Shell Programming
Course Code: MCA301
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

Batch process system programs, their components, operating characteristics, user services and limitations, implementation techniques for parallel, distributed and concurrent processing, interrupt handling, addressing techniques, file system design and management, system accounting, and other user-related services, traffic control, interprocess communication, remote procedure calls, design of system modules, and interfaces, system updating, documentation, and operation.

Objectives:

This course introduces basic understanding of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment. To make student learn fundamentals of shell scripting and shell programming. Emphases are on making student familiar with UNIX environment and issues related to it.

Learning Outcomes:

Knowledge:

1. Be familiar with basic UNIX OS concepts such as: process, program, process groups, signals, running programs, process control, address space, user and kernel modes, system calls, and context switching.
2. Master in file I/O (i.e. open, close, read, write, seek)
3. Be familiar with using sockets to implement client-server environment.
4. Be familiar with using thread execution models (e.g. Posix threads).
5. Be familiar to handle signals and exceptions within a process and to control processes.
6. Be familiar with different approaches of concurrent programming.
7. Be familiar with different batch processing systems.
8. Be familiar with remote execution techniques.

Application:

1. Master in using the C/C++ programming language, its constructs and grammar, to create system software.
2. Master in the usage of makefiles, linking, object files, loading, symbol resolution, shared and static libraries, debugging, and execution of system programs.

Course Contents:

Unit 1: The UNIX Operating System, File system, General-purpose utilities
Unit 2: The Bourne Shell, Simple filters
Unit 3: Advanced Filters – I, Advanced Filters - II
Unit 4: Line editing with ex, Vi editor
Unit 5: The Process, communication and scheduling
Unit 6: Programming with the Shell
Unit 7: Introduction to System administration.

Text Books

1. UNIX-Concepts & Applications, Sumitava Das, TMH
2. Learning UNIX Operating System,Peek, SPD/O'REILLY
3. Understanding UNIX,Srirengan,PHI

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Course Description

References

1. Learning the Vi Editor,Lamb, SPD/O'REILLY
2. Essentials Systems Administration,Frisch, SPD/O'REILLY

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Cloud Computing
Course Code: MCA302
L-T Scheme: 3-0 **Course Credits: 3**

Objectives: The course covers the fundamental concepts and practical aspects of Service Oriented Architecture. The current software development and delivery model is service oriented in nature. The applications are inherently getting distributed and shared by multiple clients. Thus, there is a need to get an insight into service oriented architectures.

Learning Outcome: After having undergone the course, the student shall be able to understand the issues related with detailed design aspects and standards of SOA.

Course Contents:
Unit-1: SOA Fundamentals, Technologies, Benefits, Challenges and basic mechanisms associated with other computing service (Delivery models - SAS, IAS & PAS, Common Cloud deployment models and cloud characters), Security threats and mechanisms.

Unit-2: Introduction and fundamental of SOA, Benefits and Goals, SOA Manifesto, SOA and network management architecture, Service as web services, Discovery and publishing of web services, Service roles, Service models, Description of services with WSDL, Messaging with SOAP.

Unit-3: Exchange patterns of message, Service activity, Coordination, Composition, Types, Activation and registration process, Business activities, Orchestration, Composition of heterogeneous web services Choreography, Addressing, Reliable messaging, Correlation, Policies, Notification and eventing.

Unit-4: Security threats and mechanisms, Essential techniques, Patterns, Security architecture for service oriented solutions, Infrastructure, Middleware, Multitenancy concepts.

Text Books
1. Service Oriented Architecture, Concepts Technology and Design, Thomas Erl,
Pearson Education, 2008
2. SOA in Practice: The Art of Distributed System Design, Nicolai M. Josuttis,
O'Reilly, 2007

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Intelligent System
Course Code: MCA303
L-T: 3-1 **Course Credits: 4**

Objective: Introducing concepts, models, algorithms, and tools for development of intelligent systems. Example topics include artificial neural networks, genetic algorithms, fuzzy systems, swarm intelligence, ant colony optimization, artificial life, and hybridizations of the above techniques. Students will be able to sense these techniques from a machine learning perspective. This domain is called Computational Intelligence, and is a numerical interpretation of biological intelligence.

Learning Outcome: On the completion of this course, the student will have:

- An understanding of fundamental computational intelligence and machine learning models.
- Implemented neural networks, genetic algorithms, and other computational intelligence and machine learning algorithms.
- Applied computational intelligence and machine learning techniques to classification, prediction, pattern recognition, and optimization problems.

Course Contents:

Computational intelligences, agents, example application domains, Representation and reasoning systems, Datalog, syntax and semantics, variables, queries, answers, recursion. Proofs, soundness, completeness, top-down and bottom-up reasoning, function symbols, Searching, graphics, generic search engine, blind search strategies, heuristic search, A* search. Pruning the search space, search direction, iterative deepening, dynamic programming, constraint satisfaction, consistency algorithms, hill climbing, randomized algorithms. Knowledge representation issues, defining a solution, choosing a representation, semantic networks, frames, primitive and derived relations. Equality, inequality, unique names assumption, complete knowledge assumption, negation as failure. Actions and planning. STRIPS representation, situation calculus, forward planning, resolution and planning. The STRIPS planner, Midterm, Regression Planning. A building situated robots Robot Architectures

Textbooks:

1. Computational Intelligence : Concepts to Implementations by Eberhart & Shi

Reference Books:

1. Introduction to Genetic Algorithms by Melanie Mitchell
2. Handbook of Genetic Algorithms by Davis
3. Machine Learning by Tom Mitchell

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Operating System & System Software
Course Code: MCA304
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

This course examines operating system design concepts, data structures and algorithms, and systems programming basics. The Topics to be covered (tentatively) include:

- Computer and operating system structures
- Process and thread management
- Process synchronization and communication
- Memory management
- Virtual memory
- File system
- I/O subsystem and device management
- Selected examples in networking, protection and security

Objectives:

This course provides a comprehensive introduction to understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in operating systems. In particular, the course will consider inherent functionality and processing of program execution. The emphasis of the course will be placed on understanding how the various elements that underlie operating system interact and provides services for execution of application software.

Learning Outcomes:
Knowledge:

1. Master functions, structures and history of operating systems
2. Master understanding of design issues associated with operating systems
3 Master various process management concepts including scheduling, synchronization , deadlocks
4. Be familiar with multithreading
5. Master concepts of memory management including virtual memory
6. Master system resources sharing among the users
7. Master issues related to file system interface and implementation, disk management
8. Be familiar with protection and security mechanisms
9. Be familiar with various types of operating systems including Unix

Application:

1. To develop, implement, and debug various CPU scheduling algorithms
2. To develop algorithms to find deadlocks
3. To develop Disk scheduling algorithms

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Course Description

Course Contents:

Unit 1: Introduction, Operating system structure - Monolithic systems, Layered systems, Virtual machines, Client-Server model.

Unit 2: Process Management – process creation, deletion, inter process communication tools: pipe, FIFO, shared memory, process synchronization, synchronization primitives and Classical IPC problems.

Unit 3: Process scheduling, Processor Allocation - Allocation Model, Design issues for processor allocation algorithms, Threads and Deadlock.

Unit 4: Memory Management, paging scheme, segmentation, virtual memory concept, page replacement algorithms, threshing, working set model, issues in Virtual memory management.

Unit 5: File System management. Input output management, Disk scheduling, Case study of UNIX/LINUX.

Text Books

1. Silberschatz, P. Galvin and Greg Gagne, "Operating System Concepts", Wiley International Company.
2. A.S. Tanenbaum, Modern Operating Systems, Prentice Hall India.

References

1. J. Archer Harris, Operating systems – Schuam's outlines, Tata Mc Graw Hill.
2. Gary Nutt, Operating Systems – A modern perspective, Pearson Education.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Management Accounting
Course Code: HU301
L-T: 2-0-0 **Course Credits: 2**

Course Objectives:

This course provides the students an understanding of relevance of cost in managerial decision making. This course provides a comprehensive knowledge of classification of cost, apportionment of overheads, process costing, activity based costing, segmental reporting, preparation of budgets and cost -volume profit analysis for decision making and cost control and

Course Outcome:

At the end of the course, students are able to

1. Explain the concepts of unit costing activity based costing, apportionment of overheads, process costing, segmental reporting and budgeting.

2. Exhibit skills in Identifying, Measuring and analyzing costing data.

3. Provide alternative solutions to cost control and related cost management applications in practice.

Unit I

Background - Nature of Management Accounting

Financial Analysis - Cash Flow Statement (as per AS3), Financial Statements Analysis

Unit II

Cost Accumulation - Fundamentals of Job-Order Batch & Process Costing, Variable Costing and Absorption (Full) Costing, Activity Based Costing System

Unit III
Profit Planning - Cost -Volume-Profit Analysis, Budgeting and Profit Planning, Flexible Budgeting

Unit IV
Cost Control - Standard Costs and quality Costs, Cost Variance Analysis, Revenue and Profit Variance Analysis, Responsibility Accounting

Relevant Costing – Introduction – Relevant Costs and Revenues- Cost Concepts – Outsourcing Decision – Decision to accept or reject a special order – Decision to continue or abandon a project

Unit V

Total Cost Management – Introduction – TCM and Business competitive edge - TCM Principles and implementation

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Course Description

Text Books:

1) Jiambalvo, lames. (2004), Managerial Accounting, 2nd Edition, Wiley India Publications, New Delhi.

Reference Books:

1) Khan, MY. Jain, P K (2000), Management Accounting, 3rd Edition; Tata McGraw Hill, New Delhi.

2) Jain, S P. Narang, K L. (2012), Cost Accounting: Principles and Practice, 23rd. Edition, Kalyani Publishers, ludhiana.

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Course Description

Reference:

Hansen & Mowen: Cost Management, Thomson Learning

Kaplan: Advanced Management accounting, Pearson education

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Statistics & Numerical Techniques
Course Code: M301
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:
The goal of this course is to provide a very common simple intuition enables one to make right decisions and especially show how mathematics is applied to solve basic fundamental problems. The Topics to be covered (tentatively) include:

Objectives:
The primary goal is to provide engineering majors with a basic knowledge of numerical methods including: root finding, elementary numerical linear algebra, integration, interpolation, solving systems of linear equations, curve fitting, and numerical solution to ordinary differential equations.'C' language and SCILAB is the software environment used for implementation and application of these numerical methods. The numerical techniques learned in this course enable students to work with mathematical models of technology and systems.

Learning Outcomes:

Knowledge:
1. Students would be able to assess the approximation techniques to formulate and apply appropriate strategy to solve real world problems.
2. Be aware of the use of numerical methods in modern scientific computing.
3. Be familiar with finite precision computation.
4. Be familiar with numerical solution of integration, linear equations, ordinary differential equations, interpolations.

Application:
1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to design and conduct experiments, as well as to analyze and interpret data
3. An ability to design a system, component, or process to meet desired needs within realistic constraints
4. such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
5. An ability to function on multidisciplinary teams

Course Contents:
Approximation in numerical computation, Truncation and rounding errors, Interpolation: Lagrange's interpolation, Newton forward and backward differences interpolation, Newton divided difference. Numerical Integration: Trapezoidal rule, Simpson 1/3 rule,Weddle's rule. Numerical solution of a system of linear equation: Gausse limination method, Matrix inversion, LU factorization method ,Gauss- Jacobi method, Gauss Seidel method. Algebraic Equation: Bisection method, Secant method, Regula–Falsi method, Newton Raphson method, Method of Iteration.Numerical solution of ordinary differential equation: Taylor'sseries method, Euler'smethod, Runga– kutta method, predictor–correction method.

Books:
1. NumericalMathematicalAnalysis, Sastry,PHI

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Course Description

Subject Name: Statistics Numerical Method and Algorithm Subject Code-BCA401
Year: 2nd Year Semester: Forth

2. NumericalMathematicalAnalysis (ByJ.B.Scarborough)
3. NumericalAnalysis&Algorithms,PradeepNiyogi,TMH
4. NumericalMathematicalAnalysis, Mathews,PHI
5. Clanguageand NumericalMethods(ByC.Xacier)
6. NumericalAnalysis(ByS.AliMollah)
7. IntroductoryNumericalAnalysis (ByDutta&Jana)
8. NumericalMethods(Problems and Solution) (ByJain,Iyengar&Jain), NewAgeInternational
9. ComputerOriented NumericalMethods,N.Dutta,VIKAS
10. NumericalMethods,Arumugam,Scitech
11. NumericalMethodsin ComputerApplications,P.U.Wayse.EPH.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Unix LAB
Course Code: MCA391
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
This course introduces basic understanding of UNIX OS, UNIX commands and File system and to familiarize students with the Linux environment. To make student learn fundamentals of shell scripting and shell programming. Emphases are on making student familiar with UNIX environment and issues related to it..

Learning Outcomes:

Upon completion of this course, the student will be able to:

1. You will be able to run various UNIX commands on a standard UNIX/LINUX Operating system (We will be using Ubuntu flavor of the Linux operating system).
2. You will be able to run C / C++ programs on UNIX.
3. You will be able to do shell programming on UNIX OS.
4. You will be able to understand and handle UNIX system calls.

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No.1: Installation of Unix/Linux operating system.
Exercise No. 2: Write a C program to emulate the UNIX ls-l command.
Exercise No. 3: Write a C program to check the given integer is prime or not.
Exercise No. 4: Write a C program to display Largest of three numbers.
Exercise No. 5: Write a shell script program to display list of user currently logged in.
Exercise No. 6: Write a shell script program to display HELLO WORLD
Exercise No. 7: Write a shell script program to develop a scientific calculator
Exercise No. 8: Write a grep/egrep script to find the number of words character, words and lines in a file.
Exercise No. 9: Shell programming.
Exercise No. 10: Write a shell script program to display the process attributes.
Exercise No. 11: Write a shell script program to check variable attributes of file and processes.
Exercise No. 12: Installation of VirtualBox (VMWare) on a PC having other operating system.
Exercise No. 13: Shell Script program for changing process priority.

Text Book:
1. Maurice J. Bach, Design of the UNIX Operating System, PHI.

Recommended Systems/Software Requirements:

1. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. Turbo C or TC3 complier in Windows XP or Linux Operating System.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Statistics & Numerical Analysis Lab
Course Code: M392
L-T–P Scheme: 0-0-3 **Course Credits: 2**

Introduction:

This course offers an advanced introduction to numerical linear algebra. Topics include direct and iterative methods for linear systems, eigen value decompositions and QR/SVD factorizations, stability and accuracy of numerical algorithms, the IEEE floating point standard, sparse and structured matrices, preconditioning and linear algebra software. Problem sets require some knowledge of MATLAB

Objectives:

1. To give an overview of what can be done.
2. To give insight into how it can be done.
3. To give the confidence to tackle numerical solutions.
4. An understanding of how a method works aids in choosing a method. It can also provide an indication of what can and will go wrong, and of the accuracy which may be obtained.
5. To gain insight into the underlying physics.
6. The aim of this course is to introduce numerical techniques that can be used on computers, rather than to provide a detailed treatment of accuracy or stability.

Learning Outcomes:

Knowledge:

On completion of this course, the student will be able to:

1. Demonstrate skills in using computer programming tools for engineering calculations.
2. Demonstrate ability to construct simple computer algorithms using a programming tool.
3. Apply simple numerical methods to solve mathematical problems with relevance to civil engineering.
4. Appreciate the limitations and the applicability of the numerical methods.
5. Apply computer-based numerical methods for the solution of engineering problems.

Course Contents:

1. Assignments on Newton forward /backward, Lagrange's interpolation.
2. Assignments on numerical integration using Trapezoidal rule, Simpson's 1/3 rule, Weddle's rule.
3. Assignments on numerical solution of a system of linear equations using Gauss elimination and Gauss-Seidel iterations.
4. Assignments on numerical solution of Algebraic Equation by Regular-falsi and Newton Raphson methods.
5. Assignments on ordinary differential equation: Euler's and Runga-Kutta methods.
6. Introduction to Software Packages: Matlab / Scilab / Labview / Mathematica.

Text Books:

1. Introductory method of numerical analysis, Sastry S.S
2. Computer Programming in fortran 77, Rajaraman V
3. Numerical methods: for scientific and engineering computation,Mahinder Kumar Jain

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Course Description

Title of Course: Computer Networks Lab
Course Code: MCA392
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:
This practical course provides students with hands on training regarding the design, troubleshooting, modeling and evaluation of computer networks. In this course, students are going to experiment in a real and simulation based test-bed networking environment, and learn about network design and troubleshooting topics and tools such as: network addressing, Address Resolution Protocol, basic troubleshooting tools (like ping, ICMP), IP routing (e.g. RIP), TCP and UDP,DHCP,ACL and many others. Student will have the opportunity to build some simple networking models using the tool and perform simulations that will help them evaluate their design approaches and expected network performance.

Learning Outcomes: The students will have a detailed knowledge network topology, Local area network, IP addressing, familiarization with network simulator, idea about networking devices, network cable and connectors, different types routing protocols, concept of remote access and different types of application layer protocol. Upon the completion of Computer network practical course, the student will be able to:

- **Learn** various network commands.
- **Understand** and implement basic of Network and Network Topology.
- **To get** idea about IP addressing schemes.
- **Understand** the benefits of network.
- **Configure** and simulate various protocols.
- **Access** remote desktop.
- **Connect** to different computer using LAN.
- **Understand** the concepts of access control.

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No.1: Study of different types of Network cables and practically implements the cross-wired cable and straight through cable using clamping tool.
Exercise No. 2: Familiarization with some network devices.
Exercise No. 3: Study of Network IP.
Exercise No. 4: Connect the computers in LAN.
Exercise No. 5: Introduction to Packet Tracer.
Exercise No. 6: Configure network topology using packet tracer.
Exercise No. 7: Configure network topology using packet tracer to find the routing path by IPRoute Command.
Exercise No. 8: Network Configuration using distance vector routing protocol.
Exercise No. 9: Configuration of DHCP Protocol
Exercise No. 10: Telnet Configuration.
Exercise No. 11: Configuration of Access Control List.

Text Book:
1. B. A. Forouzan – "Data Communications and Networking (3rd Ed.) " – TMH
Reference Book:
1. Authorized Self-Study Guide "Interconnecting Cisco Network Devices, Part 1(ICND1), 2nd Edition, January, 2008.

Recommended Systems/Software Requirements:
1. CAT-5/CAT-6 Cables, RJ 45, Cutter, Clamping Tool, Router , Switch and Hub.
2. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
3. Turbo C or TC3 complier in Windows XP or Linux Operating System.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Software Engineering & TQM
Course Code: MCA401
L-T Scheme: 3-1 **Course Credits: 3**

Pre-requisite: Good Knowledge of Computer Programming
Post Course: Object Oriented Software Engineering, Software Quality Management
Objective: To engineer good quality software from its specification.

Learning Outcomes
1. Familiar with processes of Software Engineering
2. Awareness about handling the complexities that may arise in various stages of SDLC
3. Generating test cases for software testing
4. Computer Aided Software Engineering
5. Aspect of Quality in Software Development
6. The Rational method

Course Contents:
Unit I- Interactive Systems, Usability, Introduction to software engineering, Software process models, PSP, TSP, Requirement Engineering: Requirement Elicitation, Analysis, Specification, SRS, Formal system development techniques.

Unit II- Analysis and Modeling: Data modeling, Functional modeling Software Architecture and Design: Data design, Architectural Design Process, SADT, OOAD, function-oriented design, Design Patterns: Structural Patterns, Behavioral Patterns, and Creational Patterns.

Unit III- UML: Use case diagram, State diagram, Activity Diagram, Class Diagram, Sequence diagram, Collaboration diagram, Deployment Diagram, Event trace diagram.

Unit IV- Software Estimation: Estimating Size, Effort and Cost: Metric for Analysis, Metric for Design, COCOMO model, Putnam Model etc., Implementation and Integration: Coding standard and practices.

Unit V- Software Testing: Top-Down and Bottom–up Approach, Verification and Validation, Structural testing, functional Testing, Testing Strategies, Test Case design.

Unit VI- Software Maintenance: Types, Cost of Software, maintenance, Software Maintenance Models, CASE Tool Taxonomy: Business Process Engineering tool, Process modeling and management tool, project planning tool, requirement tracking tool, Metric and management tool, documentation tool, system software tool etc.Introduction to software engineering for web and mobile applications.

Text Books
1. Software Engineering: A practitioner's approach: Roger S. Pressman, McGraw- Hill Publications (Sixth Edition).
2. Fundamentals of Software Engineering: Mall, Rajib, Prentice Hall of India, New Delhi (2nd Edition).

References
1. Software Testing Techniques, B. Beizer.
2. Structured Systems Analysis: Tools and Techniques, Gane and Sarson.
3. Software Engineering, Sommerville, Addison Wesley.
4. Modern Structured Analysis, E.Yourdon.
5. An Integrated approach to Software Engineering: Pankaj Jalote, Narosa Publishing House.

6. Structured design, E. Yourdon and L.Constantine.
7. Fundamentals of Software Engineering: Ghezzi, Jazayeri, Mandriol, PHI

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Compiler Graphics & Multimedia
Course Code: MCA402
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

Computer Graphics course presents an introduction to computer graphics designed to give the student an overview of fundamental principles. It covers the fundamental concepts in creating graphical images on the computer. Computer graphics uses ideas from Art, Mathematics, and Computer Science to create images. Course work stresses the reduction of concepts to practice in the form of numerous programming assignments. The course will include an overview of common graphics hardware, 2D and 3D transformations and viewing, and basic raster graphics concepts such as scan-conversion and clipping. Methods for modeling objects as polygonal meshes or smooth surfaces, and as rendering such as hidden-surface removal, shading, illumination, and shadows will be investigated.

Multimedia course provides mainstreaming the technological media within what is called "Multimedia" is the pattern which led to infinite applications of computer technologies. The concept of this technology came into being with the appearance of sound cards, then compact disks, then came the use of digital camera, then the video which made computer an essential educational tool. Nowadays, multimedia expanded to become a field on its own.

Objectives:

This course is designed to provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends. A thorough introduction to computer graphics techniques, focusing on 3D modelling, image synthesis, and rendering. We will look at raster scan graphics including line and circle drawing, polygon filling, anti-aliasing algorithms, clipping, hidden-line and hidden surface algorithms including ray tracing and, of course, rendering - the art of making photo realistic pictures with local and global illumination models. The interdisciplinary nature of computer graphics is emphasized in the wide variety of examples and applications. The purpose of multimedia study is to find out the impact of using multimedia on students' academic achievement in the College of Education at King Saud University. This study's effort is to answer the following questions like what is the impact of using multimedia on students' academic achievement in the "computer & its use in education" curriculum and are there any statistically-significant differences between the average marks of the experimental group & that of the control group in the pre & post measurements of students' academic achievement in the school of Education?

Learning Outcomes:
Knowledge:

1. To know and be able to understand the core concepts of computer graphics.
2. To know and be capable of using OpenGL to create interactive computer graphics.
3. To know and be able to understand a typical graphics pipeline.

4. To know and be able to make interactive graphics applications in C++ using one or more graphics application programming interfaces.
5. To know and be able to demonstrate an understanding of the use of object hierarchy in graphics applications.
6. To know and be able to write program functions to implement visibility detection.
7. To know and be able to make pictures with their computer.
8. To know and be able to describe the general software architecture of programs that use 3D computer graphics
9. To know the pictorial representation of various points in a image

Application:

1. Know and be able to discuss hardware system architecture for computer graphics. This includes, but is not limited to: graphics pipeline, frame buffers, and graphic accelerators/co-processors.

2. Know and be able to use a current 3D graphics API (e.g., OpenGL or DirectX).

3. Know and be able to use the underlying algorithms, mathematical concepts, supporting computer graphics. These include but are not limited to:

• Composite 3D homogeneous matrices for translation, rotation, and scaling transformations.
• Plane, surface normals, cross and dot products.
• Hidden surface detection / removal.
• Scene graphs, display lists.

4. Know and be able to select among models for lighting/shading: Color, ambient light; distant and light with sources; Phong reflection model; and shading (flat, smooth, Gourand, Phong).

5. Know and be able to use and select among current models for surfaces (e.g., geometric; polygonal; hierarchical; mesh; curves, splines, and NURBS; particle.

6. Know and be able to design and implement model and viewing transformations, the graphics pipeline and an interactive render loop with a 3D graphics API.

7. Be able to design and implement models of surfaces, lights, sounds, and textures (with texture transformations) using a 3D graphics API.

8. Be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.

9. Be able to discuss future trends in computer graphics and quickly learn future computer graphics concepts and APIs.

Course Contents:

Unit 1: **Introduction to computer graphics & graphics systems**

Overview of computer graphics, representing pictures, preparing, presenting & interacting with pictures for presentations; Visualization & image processing; RGB color model, direct coding, lookup table; storage tube graphics display, Raster scan display, 3D viewing devices, Plotters, printers, digitizers, Light pens etc.; Active & Passive graphics devices; Computer graphics software.

Scan conversion

Points & lines, Line drawing algorithms; DDA algorithm, Bresenham's line algorithm, Circle generation algorithm; Ellipse generating algorithm; scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

Unit 2: **2D transformation & viewing**

Basic transformations: translation, rotation, scaling; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines , parallel lines, intersecting lines. Viewing pipeline, Window to viewport co-ordinate transformation, clipping operations, point clipping, line clipping, clipping circles, polygons & ellipse.

3D transformation & viewing

3D transformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel projection transformation; clipping, viewport clipping, 3D viewing

Unit 3: Curves

Curve representation, surfaces, designs, Bezier curves, B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves. Hidden surfaces, Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Painter's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods, fractal - geometry. Color & shading models Light & color model; interpolative shading model; Texture.

Unit 4: Multimedia

Introduction to Multimedia: Concepts, uses of multimedia, hypertext and hypermedia; Image, video and audio standards. Audio: digital audio, MIDI, processing sound, sampling, compression. Video: MPEG compression standards, compression through spatial and temporal redundancy, inter-frame and intra-frame compression. Animation: types, techniques, key frame animation, utility, morphing. Virtual Reality concepts.

Text Books

1. Hearn, Baker – " Computer Graphics (C version 2nd Ed.)" – Pearson education
2. Z. Xiang, R. Plastock – " Schaum's outlines Computer Graphics (2nd Ed.)" – TMH
3. D. F. Rogers, J. A. Adams – " Mathematical Elements for Computer Graphics (2nd Ed.)" – TMH
4. Mukherjee, Fundamentals of Computer graphics & Multimedia, PHI
5. Sanhker, Multimedia –A Practical Approach, Jaico
6. Buford J. K. – "Multimedia Systems" – Pearson Education
7. Andleigh & Thakrar, Multimedia, PHI
8. Mukherjee Arup, Introduction to Computer Graphics, Vikas
9. Hill,Computer Graphics using open GL, Pearson Education

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: DBMS-II
Course Code: MCA303
L-T Scheme: 4-0 **Course Credits: 4**

Introduction

Database Management Systems (DBMS) consists of a set of interrelated data and a set of programs to access that data. They underpin any computer system and are therefore fundamental to any program of study in computer science. An understanding of DBMS is crucial in order to appreciate the limitations of data storage and application behavior and to identify why performance problems arise. Students who complete this course are expected to develop the ability to design, implement and manipulate databases. Students will apply and build databases for various day to day real life scenarios and real life applications. The course will by and large be structured but will introduce open-ended data base problems.

Course Objectives (Post-conditions)

Knowledge objectives:

- Ability to build normalized databases.
- Knowledge of storage and indexing, disks and files
- Familiarity with SQL, embedded SQL and PLSQL
- Familiarity with tree structured indexing
- Understanding of transaction processing and evaluating relational operators
- Ability to handle recovery and concurrency issues and typical relational query optimizer
- Familiarity with physical database design and tuning.

Outcomes:

- Develop the ability to design, implement and manipulate databases.
- Introduce students to build tree structured indexing.
- Apply DBMS concepts to recovery and concurrency issues and typical relational query optimizer.

Course Contents:

Unit 1: OVERVIEW OF STORAGE AND INDEXING, DISKS AND FILES: Data on external storage; File. Organizations and indexing; Index data structures; Comparison of file organizations; Indexes and Performance tuning. Memory hierarchy; RAID; Disk space management; Buffer manager; Files ofrecords; Page formats and record formats.

Unit 2: TREE STRUCTURED INDEXING: Intuition for tree indexes; Indexed sequential access method; B+ trees,Search, Insert, Delete, Duplicates, B+ trees in practice.

Unit 3: HASH-BASED INDEXING: Static hashing; Extendible hashing, Linear hashing, comparisons.

Unit 4: OVERVIEW OF QUERY EVALUATION, EXTERNAL SORTING: The system catalog; Introduction tooperator evaluation; Algorithms for relational operations; Introduction to query optimization;Alternative plans: A motivating example; what a typical optimizer does. When does a DBMS sort data? Asimple two-way merge sort; External merge sort

Unit 5: EVALUATING RELATIONAL OPERATORS: The Selection operation; General selection conditions; TheProjection operation; The Join operation; The Set operations; Aggregate operations; The impact ofbufferingConcurrency control and recovery system:Lock based protocol, dead lock handling, time stamp based and validation based protocol,failure classification, storage, recovery algorithm, recovery and atomicity,backup.

Unit 6: A TYPICAL RELATIONAL QUERY OPTIMIZER: Translating SQL queries in to Relational Algebra; Estimatingthe cost of a plan; Relational algebra equivalences; Enumeration of alternative plans; Nested subqueries;Other approaches to query optimization.

Unit 7:PHYSICAL DATABASE DESIGN AND TUNING: Introduction; Guidelines for index selection, examples;Clustering and indexing; Indexes that enable index-only plans; Tools to assist in index selection;Overview of database tuning; Choices in tuning the conceptual schema; Choices in tuning queries andviews; Impact of concurrency; DBMS benchmarking.

Unit 8:MORE RECENT APPLICATIONS: Mobile databases; Multimedia databases; Geographical Information Systems; Genome data management.

Text Books:

1. Silberschatz, Korth and Sudarshan, "Database System Concepts", 6th Edition,McGraw Hill, 2010

2. Elmasri and Navathe, "Fundamentals of Database Systems", 6th Edition, Pearson, Addison-Wesley, 2010

References:

1. C.J. Date, "An Introduction to Database Systems", 8th Edition, Addison-Wesley, 2003

2. Ramakrishnan&Gherke, Database Management Systems, 2nd Edn., McGraw

3. Connolly and Begg, "Database Systems", 4th Edn., Addison-Wesley, 2005

4. Toby, Lightstone and Jagadish, "Database Modeling and Design", 5th Edn, Elsevier, 2011

5. Coronel and Rob, "Database Systems", 9th Edn.,Cengage, 2011

6. IEEE / ACM Transactions on Database Systems (TODS).

7. DBMS related Journals.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Operation Research & Optimization Techniques
Course Code: MM401
L-T Scheme: 3-1 **Course Credits: 4**

Introduction:

The goal of this course is to provide a very common simple intuition enables one to make right decisions and especially show how mathematics is applied to solve fundamental engineering problems. The Topics to be covered (tentatively) include:

Linear programming problems

Transportation and Assignments problems

Network Analysis

Queue Theory

Non Linear Programming

Course Objectives:

It lays the required foundation and skills that can be repeatedly employed in subsequent courses at higher levels. Students will acquire the skills and techniques of:

1. Discuss about algebraic solution of the linear problem with certain constrains.
2. Obtain the optimal solution of Transportation and Assignment problems.
3. Discuss about Network Analysis problems.
4. Discuss about six main factor of waiting line.
5. Solve the Nonlinear Programming problems.

Learning Outcomes:
Knowledge:

1. Student completing the first unit of this course would be expected to find the solution of linear programming problems using Graphical method and simplex method.
2. At the end of second unit student will be able toassign different jobs to the different person to have the optimum efficiency of working and similar in transportation problems.
3. After the completion of the third unit, student will be able to calculate the shortest path of the graph by several methods and Algorithms.
4. At the end of forth unit student will be able find the optimal no. of servers such that the sum of cost of service and waiting is minimized.
5. At Student completing the fifth unit of this course would be expected to find the solution of Nonlinear programming problems using several methods.

Application:

1. First unit of this course would be expected to formulate and solve the linear programming problems with the given constrains.

2. Second unit student will be able to assign different jobs to the different person to have the optimum efficiency of working and similar in transportation problems.
3. Third unit student will be able to calculate the shortest path of the graph by several methods and Algorithms.
4. Forth unit student will be able find the optimal no. of servers such that the sum of cost of service and waiting is minimized.
5. Fifth unit of this course would be expected to find the solution of Nonlinear programming problems using several methods.

Course Contents:

Unit 1:**LinearProgramming (LP):** NatureofLPproblemsthroughexamples;Formulationof LPProblems;Graphicalsolutionsof two decisionvariableproblems;Propertiesof a solutiontoLPproblems:convexsolutionspaceandextremepointsolution;Generalformof LPmodel;Simplexmethodanditsmeaning;Stepsofsimplexmethodintabularform;SolvingLPproblemsbySimplexMethod;Sensitivityanalysis.

Unit 2: Transportation&AssignmentProblems: Natureofatransportationordistributionproblem;Tabularrepresentationof atransportationproblem;North-WestCorner initial solution;Steppingstonemethod;Conceptofdummysourceordestination;Vogel's approximationmethod.NatureofanAssignmentproblem;Tabularrepresentation; Hungarianmethodfor solvingassignmentproblems.

Unit 3: NetworkAnalysis: Networkmodelsandterminologieslikearcs,nodes,paths,tree,Spanningtree;shortestpath , routeproblem;Theminimumspanningtreeproblem;The maximalflowproblem.

Unit 4:WaitinglineProblems: StructureofawaitinglineSystem:Single-channelwaitingline,processofarrivals,distributionofservicetimes,queuediscipline,steadystageoperation;SinglechannelmodelwithPoissonarrivalsandexponentialservicetime;MultiplechannelmodelwithPoissonarrivalandexponentialservicetimes;SinglechannelmodelwithPoissonarrivalsandarbitraryservicetime(M/G/1);Economic analysisof waitinglines.

Unit 5: Non-Linear Programming: Graphical illustration of a non-linear programmingproblem;Unconstrainedoptimization by(i)directsearchmethod,(ii)steepestdecent method; Constrainedoptimizationby Lagrangemultipliers;Integer linear programmingbybranch&boundtechnique;Dynamicprogramming problemsandtheir characteristics; Bellman'sprincipleofoptimality;solving(i)Stagecoachproblem,(ii) Knapsackproblem.

BOOKS

1. KantiSwarup,P.K. GuptaandManmohan,OperationsResearch,SultanChand&Sons.
2. I.A.Taha,OperationsResearch:An Introduction,PearsonPublication
3. C.K.Musatfi,OperationsResearch,New AgeInternationalPublishers

4. S.S.Rao, EngineeringOptimization,NewAgeInternationalPublishers
5. R.Panneerselvam,OperationsResearch,PrenticeHallofIndia
6. F.S.HillierandG.J. Lieberman,IntroductiontoOperationsResearch,TMH.

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Basic Environment & Ecology
Course Code: HU401
L-T Scheme: 2-1 **Course Credits: 3**

Introduction:

This course introduces the basic principles behind the environmental phenomena and how anthropogenic activities are affecting those environmental processes. The different administrative measures taken to safeguard our environment are also discussed in this course. The Topics to be covered (tentatively) include:

- Ecology
- Air pollution and control
- Water Pollution and Control
- Land Pollution
- Noise Pollution
- Environmental Management

Objectives:

In this course we will study about the pattern of growing human population and its effect on the planet. We will be familiarizing with the consequences of anthropogenic activities and measures to mitigate their harmful effects. We will learn about the mechanism behind the global issues like global warming, acid rain, water pollution, etc.

Learning Outcomes:

Knowledge:

1. To introduce the patterns of population growth and associated problems.
2. To familiarise with the cause, effect and control measures of various human made degrading processes.
3. To enable the students to know the mechanism behind the devices to control pollution.
4. To familiarise with administrative laws to mitigate various environmental problems.

Application:

1. To understand the problems associated with pollution
2. To familiarise with the global environmental issues.
3. To understand the principles behind various control devices.
4. To understand and comply with the various government environmental laws.

Course Contents:

Unit 1: Introduction, Ecology, Air pollution and control

Unit 2: Water Pollution and Control

Unit 3: Land Pollution, Noise Pollution

Unit 4: Environmental Management

Text Books

1. Gourkrishna Damohapatra, Basic Environmental Engineering and Elementary Biology, Vikas publishing.

References

1. A.K. De, Environmental Chemistry, New Age International.

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UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Software Project Management Lab
Course Code: MCA491
L-T-P scheme: 0-0-3 **Course Credit: 2**

Prerequisite: Students must have already registered for the course, "Software Engineering".

Objectives: Students will be capable to acquire the generic software development skill through various stages of software life cycle. He will also be able to ensure the quality of software through software development with various protocol based environment.

Learning Outcomes: After completion of course student will be able to generate test cases for software testing. Students will also be able to handle software development models through rational method.

Course Contents:
Unit I- Introduction to software engineering: Code comprehension.
Unit II- Requirement engineering: Requirement Elicitation, specification, IEEE standard template for SRS, Requirement Engineering tools.
Unit III- UML Modeling: Use case diagram , State diagram, Activity Diagram, Class Diagram, Sequence diagram, Collaboration diagram, Deployment Diagram, Component Diagram, Event trace diagram , c++ code generation, Introduction to Sec UML.
Unit IV- Software Metrics: Product, process and project metrics.
Unit V- Software Testing: Structural testing, functional Testing, Testing Strategies and Tactics, Test Case design.

List of Experiments

1. Identifying the Requirements from Problem Statements Requirements, Characteristics of Requirements, Categorization of Requirements, Functional Requirements, Identifying Functional Requirements
2. E-R Modeling from the Problem Statements, Entity Relationship Model, Entity Set and Relationship Set, Attributes of Entity, Keys, Weak Entity, Entity Generalization and Specialization, Mapping Cardinalities, ER Diagram, Graphical Notations for ER Diagram Importance of ER modeling
3. Identifying Domain Classes from the Problem Statements, Domain Class, Traditional Techniques for Identification of Classes, Grammatical Approach Using Nouns, Advantages, Disadvantages, Using Generalization, Using Subclasses, Steps to Identify Domain Classes from Problem Statement, Advanced Concepts
4. Modeling UML Use Case Diagrams and Capturing Use Case Scenarios, Use case diagrams, Actor, Use Case, Subject, Graphical Representation, Association between Actors and Use Cases, Use Case Relationships, Include
5. Modeling UML Class Diagrams and Sequence diagrams, Structural and Behavioral aspects, Class diagram, Elements in class diagram, Class Relationships, Sequence diagram, Elements in sequence diagram, Object, Life-line bar, Messages.
6. Modeling Data Flow Diagrams, Data Flow Diagram, Graphical notations for Data Flow Diagram, Explanation of Symbols used in DFD, Context diagram and leveling DFD
7. Statechart and Activity Modeling Statechart Diagrams, Building Blocks of a Statechart Diagram State, Transition, Action, Guidelines for drawing Statechart Diagrams, Activity Diagrams, Components of an Activity Diagram, Activity, Flow Decision, Merge, Fork, Join, Note, Partition, A Simple Example, Guidelines for drawing an Activity Diagram
8. Estimation of Project Metrics Project Estimation Techniques, COCOMO, Basic COCOMO Model, Intermediate COCOMO Model, Complete COCOMO Model, Advantages of COCOMO, Drawbacks of COCOMO, Halstead's Complexity Metrics.
9. Estimation of Test Coverage Metrics and Structural Complexity, Control Flow Graph, Terminologies, McCabe's Cyclomatic Complexity, Computing Cyclomatic Complexity, Optimum Value of Cyclomatic Complexity, Merits, Demerits

References

1. R.S. Pressman, “Software Engineering: A Practitioner's Approach”, 7Edition, McGraw Hill, 2010
2. 2. Fundamentals of Software Engineering: Mall, Rajib, Prentice Hall of India, New Delhi (2nd Edition).
3. 2. Sommerville, “Introduction to Software Engineering”, 8Edition, Addison-Wesley, 2007
4. Ghezzi, Jazayeri and Mandrioli, “Fundamentals of Software Engineering”, 2Edition, Prentice-Hall, 2003
5. Peters and Pedrycz, “Software Engineering: An Engineering Approach, John Wiley, 2004
6. Len Bass, “Software Architecture in Practice”, 2Edn. Addison Wesley, 2003
7. Allamaraju, “Professional Java Server Programming”, Apress, 2004

UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Course Description

Title of Course: Computer Graphics Lab
Course Code: MCA402
L-T Scheme: 0-0-3 **Course Credits:2**

Introduction:

This course presents an introduction to computer graphics designed to give the student an overview of fundamental principles. It covers the fundamental concepts in creating graphical images on the computer. Computer graphics uses ideas from Art, Mathematics, and Computer Science to create images. Course work stresses the reduction of concepts to practice in the form of numerous programming assignments. The course will include an overview of common graphics hardware, 2D and 3D transformations and viewing, and basic raster graphics concepts such as scan-conversion and clipping. Methods for modeling objects as polygonal meshes or smooth surfaces, and as rendering such as hidden-surface removal, shading, illumination, and shadows will be investigated.

Objectives:

This course is designed to provide a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends. A thorough introduction to computer graphics techniques, focusing on 3D modelling, image synthesis, and rendering. We will look at raster scan graphics including line and circle drawing, polygon filling, anti-aliasing algorithms, clipping, hidden-line and hidden surface algorithms including ray tracing and, of course, rendering - the art of making photo realistic pictures with local and global illumination models. The interdisciplinary nature of computer graphics is emphasized in the wide variety of examples and applications.

Learning Outcomes:
Knowledge:

1. To know and be able to understand the core concepts of computer graphics.
2. To know and be capable of using OpenGL to create interactive computer graphics.
3. To know and be able to understand a typical graphics pipeline.
4. To know and be able to make interactive graphics applications in C++ using one or more graphics application programming interfaces.
5. To know and be able to demonstrate an understanding of the use of object hierarchy in graphics applications.
6. To know and be able to write program functions to implement visibility detection.
7. To know and be able to make pictures with their computer.
8. To know and be able to describe the general software architecture of programs that use 3D computer graphics

Experiments:

1. Study of basic graphics functions defined in “graphics.h”
2. Write a program to draw a any geometrical figure.
3. Write a program to draw a line using Bresenham’s algorithm
4. Write a program to draw a line using DDA algorithm
5. Write a program to draw a line using Mid point algorithm

6. Write a program to draw a circle using Midpoint algorithm
7. Write a program to draw a Ellipse using Midpoint algorithm

Recommended Systems/Software Requirements:

1. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. Turbo C or TC3 complier in Windows XP or Linux Operating System.

Text Books

1. Hearn, Baker – "Computer Graphics (C version 2nd Ed.)" – Pearson education
2. Z. Xiang, R. Plastock – " Schaum's outlines Computer Graphics (2nd Ed.)" – TMH
3. D. F. Rogers, J. A. Adams – "Mathematical Elements for Computer Graphics (2nd Ed.)" –TMH

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Course Description

Title of Course: Multimedia Lab
Course Code: MCA492
L-T-P scheme: 0-0-3 **Course Credit: 2**

Objectives:

1. This course is designed to maximize learning through the use of strategies such as outcome based instruction, collaborative learning,
2. Contextual application and performance based assessment. Lecture material will consist of discussion, diagrams, multimedia, and other
3. Educationally sound practices. Other activities will include hands-on utilization of multimedia software. Demonstration and handout materials will be provided.
4. Students will be required to interact in class discussions, perform effective internet searches, and prepare a simple interactive multimedia project.

Learning Outcomes: The students will have a detailed knowledge of the concepts of image editing by adobe Photoshop, Creation of Animation by Macromedia Flash, Sound Editing by Sound Forge, Video Editing by Premier and Web designing by HTML, DHTML etc.
Upon the completion of Operating Systems practical course, the student will be able to:

- **Define** multimedia to potential clients.
- **Identify** and describe the function of the general skill sets in the multimedia industry.
- **Identify** the basic components of a multimedia project
- **Identify** the basic hardware and software requirements for multimedia development and playback

Course Contents:
Exercises that must be done in this course are listed below:
Exercise No.1: ImageeditingusingtoolslikeAdobePhotoshop
Exercise No. 2: Soundcapturing&editingusingtoolslikeSOUNDFORGE
Exercise No. 3: Creating/editinganimation usingtoolslike FLASH
Exercise No. 4: Creating/editingmotionvideo usingtoolslike PREMIER
Exercise No. 6: Creation of Content using HTML (basic tags, table form, frame, link to other Image)
Exercise No. 7: Creating Style Sheet using DHTML
Exercise No. 8: Home page creation using DHTML and HTML

Text Book:
1. Adobe, AdobePhotoshop6.0: Classroominabook PearsonEd.
2. Anushka Wirasinha, Flash inaFlash-WebDevelopment, PHI
3. MacromediaFlash5fastandeasyWebDevelopment, Design, PHI
4. Castro, HTML4fortheWorldWideWeb, PearsonEd.
5. Schurman&Purdi, DynamicHTMLinAction, SecondEdition, PHI
6. Lozano,Multimedia- Sound&Video, PHI

Recommended Systems/Software Requirements:

1. Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. Adobe Photoshop 6.0
3. Adobe Macromedia Flash.
4. Premier CS5.
5. Sound Forge 7.0
6. Web Browser (Internet Explorer / Mozilla/ Google Chrome)

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Course Description

Title of Course: Advanced Database LAB
Course Code: MCA493
L-T-P Scheme: 0-0-3 **Course Credits: 2**

Objective:

- To get familiar with basic EER concepts (generalization and specialization)
- Study of ODL schema.
- Implement Abstract data type.
- To study varying array.
- Implement object Table.
- To study implementation of nested tables.
- To understand use of objects in member procedure.
- To study horizontal Partitioning
- To study horizontal Partitioning.
- To study semistructureddata.

Learning Outcomes:

- Ability to build normalized databases.
- Knowledge of Entity Relationship Modelling.
- Familiarity with SQL, embedded SQL and PLSQL, ODL schema.
- Familiarity with query processing and query optimization techniques.
- Understanding of Member procedure.,Partitioning on the tables.
- Ability to handle recovery and concurrency issues.
- Familiarity with XML commands.

Course Contents:

Exercises that must be done in this course are listed below:

Exercise No.1: Study of EER diagram.
Exercise No. 2: Study of ODL schema.
Exercise No. 3: Implement Abstract data type.
Exercise No. 4: Implement Varrays.
Exercise No. 5: Implement object Table.
Exercise No. 6: Implement Nested table.
Exercise No. 7: Implement Member procedure.
Exercise No. 8: Implement Member Function.
Exercise No. 9: Implement Partitioning on the tables.
Exercise No. 10: Study of XML commands.

References

1. “Database Systems: A Practical Approach to design, Implementation and Management”. Thomas Connolly, Carolyn Begg; Third Edition, Pearson Education.
2. "Fundamentals of Database Systems" Elmasri, Navathe, Pearson Education.
3. Bipin C Desai, ?An Introduction to Database Systems?, Galgotia. Publications Pvt Limited, 2001
4. “An Introduction to Database Systems”, C.J.Date, Pearson Education.
5. “A first course in Database Systems”, Jeffrey D. Ullman, Jennifer Windon, Pearson, Education.
6. “Data Management: databases and organization”, Richard T. Watson, Wiley.
7. “DataModeling Essentials”, Graeme C. Simxion, Dreamtech.
8. Introduction to Data Base Management, Naveen Prakash, Tata McGraw Hill
9. “Oracle 10g manuals”.