

3rd SEMESTER M.C.A

F.M-70

MCA-201 SOFTWARE ENGINEERING & OOAD (3-1-0)Cr.-4

Module I (10 hrs)

Introductory concepts: Introduction, definition, objectives, Life cycle – Requirements analysis and specification.

Design and Analysis: Cohesion and coupling, Data flow oriented Design: Transform centered design, Transaction centered design. Analysis of specific systems likes Inventory control, Reservation system.

Module II (10 hrs)

Object-oriented Design: Object modeling using UML, use case diagram, class diagram, interaction diagrams: activity diagram, unified development process.

Module III (12 hrs)

Implementing and Testing: Programming language characteristics, fundamentals, languages, classes, coding style efficiency. Testing: Objectives, black box and white box testing, various testing strategies, Art of debugging. Maintenance, Reliability and Availability: Maintenance: Characteristics, controlling factors, maintenance tasks, side effects, preventive maintenance – Re Engineering – Reverse Engineering – configuration management – Maintenance tools and techniques. Reliability: Concepts, Errors, Faults, Repair and availability, reliability and availability models, Recent trends and developments.

Module IV (8 hrs)

Software quality: SEI CMM and ISO-9001. Software reliability and fault-tolerance, software project planning, monitoring, and control. Computer-aided software engineering (CASE), Component model of software development, Software reuse.

Book:

1. Rajib Mall, Fundamentals of Software Engineering, PHI.
2. R.S. Pressman, Software Engineering Practitioner's Approach, TMH.
3. S.L. Pfleeger, Software Engineering – Theory and Practice, 2nd Edition, Pearson Education.
4. M.L. Shooman, Software Engineering – Design, Reliability and Management, McGraw Hill.

3rd SEMESTER MCA

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MCA-202

OPERATING SYSTEMS (3-1-0)Cr.-4

Module 1 (9 hrs)

Evolution of Operating Systems: Types of operating systems - Different views of the operating systems – Principles of Design and Implementation. The process concept – system programmer's view of processes – operating system's views of processes – operating system services for process management. Process scheduling – Schedulers – Scheduling Algorithms.

Module II (9 hrs)

Structural overview, Concept of process and Process synchronization, Process Management and Scheduling, Hardware requirements: protection, context switching, privileged mode; Threads and their Management; Tools and Constructs for Concurrency, Detection and Prevention of deadlocks, Mutual Exclusion: Algorithms, semaphores – concurrent programming using semaphores.

Module III (10 hrs)

Memory Management paging, virtual memory management, Contiguous allocation – static, dynamic partitioned memory allocation – segmentation. Non-contiguous allocation – paging – Hardware support – Virtual Memory, Dynamic Resource Allocation.

Module IV (12 hrs)

File Systems: A Simple file system – General model of a file system – Symbolic file system – Access control verification – Logical file system – Physical file system – allocation strategy module – Device strategy module, I/O initiators, Device handlers – Disk scheduling, Design of IO systems, File Management.

Introduction to Unix and Unix commands. Introduction of sed, awk and grep family.

Books:

1. A. Silberschatz & P.B. Galvin, Operating Systems Concepts, Addison – Wesley.
2. Tanenbaum, Modern Operating System, Pearson Education.
3. S.Madnick and J.J.Donovan, McGraw Hill

MCA-203

QUANTITATIVE TECHNIQUES (3-1-0)Cr.-4

Module I (10 hrs)

Operation Research: Behavioral versus quantitative decision making, role of models. Linear programming, Graphical and Simplex procedure, sensitivity analysis; Transportation and Assignment problems, Application of linear programming in business and other systems.

Module II (10 hrs)

Integer linear Programming: Branch and Bound Algorithm, Zero – one Implicit Enumeration Algorithm, Cutting Plane Algorithm. Introduction to queuing, Single and Multiple server models, finite population models, queuing costs and applications. Theory of games: optimal solution of Two – Person Zero sum games, solution of mixed strategy games. Minimal spanning tree Algorithm, shortest Route problem.

Module III (10 hrs)

(Probability and Statistics)

Probability: Classical, relative frequency and axiomatic definitions of probability, addition rule and conditional probability multiplication rule, total probability, Baye's Theorem, and independence.

Random Variables: Discrete, Continuous and mixed random variable, Probability mass, Probability density and Commutative distribution functions, Mathematical Expectations, moments, moment generating function, chebyshevi Inequality.

Module IV (10 hrs)

Special Distributions: Discrete uniform, Binomial, Geometric Poisson, Exponential, Normal distributions, Functions of a Random variable. Joint Distributions: Joint, marginal, and conditional distributions, Product moments, Correlation, independence of random variables, bivariate normal distribution.

Books:

1. Taha, Operation Research, PHI
2. Jhon. E. Freund, Mathematical Statistics. PHI
3. Trivedi, Probability Statistics, PHI

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MCA-204 COMPUTER GRAPHICS & MULTIMEDIA(3-1-0)Cr.-4

Module I (8 hrs)

A Survey of Computer Graphics: Computer Aided Design, Presentation Graphics, Computer art, Entertainment, education and Training, Visualization, Image Processing, graphical User Interface.

Overview of Graphics System: Video Display Devices, Raster-Scan and Random Scan Systems, Input Devices Hard Copy Devices, Graphics Software.

Graphic User Interface and Interactive Input Methods: The User Dialogue, Input of graphical Data, Input Function, Initial Values for input Device parameters, Interactive Picture construction.

Output Primitives: Points and lines Bresenham's Line Algorithm, Midpoint Circle Algorithm, Filled Area Primitives.

Attributes of Output Primitives: Line Curve, Color, Area fill and Character Attributes, Bundled Attributes, Antialiasing.

Module II (8 hrs)

Two Dimensional Geometric Transformation: Basic Transformation (Translation, rotation, Scaling) Matrix Representation and Homogeneous coordination, Composite Transformations, Reflection Shears, Transformation between coordinate system.

Two Dimensional Viewing: the viewing Pipeline Viewing coordinate Reference frame, window-to view port coordinate Transformatin.

Line Clipping (Cohen-Sutherland Algorithm) and Polygon Clipping (Sutherland-Hodgeman Algorithm)

Module III (8 hrs)

Three Dimensional Object Representation: Polygon Surface, quadratic Surface, Spline Representative, Bezier Curves and Surface B-Spline Curves and surfaces.

Fractal Geometry Methods: Fractal Generation Procedure, Classification of Fractarals Dimension, geometric Construction of Deterministic self similar.

Three Dimensional Geometric and Modeling Transformations: Translation Rotation, Scaling, Reflections, shear, Composite Transformation, Modeling and Coordinate Transformation.

Three Dimensional Viewing: Viewing Pipeline, Viewing Coordinates, Projections (Parallel and Prospective) Clipping Implementation of above using open GL

Module IV (8 hrs)

Visible Surface Detection Method: Backface Detection, Depth Buffer, A Buffer, Scan line and Depth sorting

Illumination Models: Basic Models, Displaying Light Intensities, Halftone Pattern and Dithering Techniques

Surface Rendering Methods: Polygon Rendering Methods, Gouraud and Phong Shading

Quick Introduction to Computer Animation ,Implementation of above using GL

Module V (8 hrs)

Multimedia Fundamentals:

Introduction, Multimedia and Hypermedia, WWW, Multimedia software tools, Multimedia Authoring and Tools, graphics and image data Representation. Color models in images and video, Fundamental concepts in video, basics of digital Audio, raster scanning Principle, MPEG (MPEG-1 and 2), DVI Technology, Multimedia application Toolkit and Hyper application.

Books:

1. Computer Graphics, D.Hearn and M.P.Baker (C Version), Prentice Hall, 1999
2. Principle of Interactive Graphics by Neumann, TMH
3. Computer Graphics Multimedia and Animation – by Malay K.Pakhira, PHI.
4. Procedural Elements for Computer Graphics by David F. Rogers, TMH

3rd SEMESTER MCA

MCA-205 **FINANCIAL AND MANAGEMENT ACCOUNTING (3-1-0)Cr.-4** **F.M.- 70**

Module I

Accounting Information: (10 hrs)

Concepts, Conventions and Standards. Preparation of Journals, Ledgers, Trial Balance and Profit & Loss Account and Balance Sheet of a concern. Uses of Accounting Information.

Module II

Accounting relating to the Companies: (5 hrs)

Sources of Capital, Types of Share Capital, Accounting for issue, allotment of Shares and Debentures, Forfeiture of Shares and Issue of Bonus Shares.

Module III

Working Capital (5 hrs)

Estimation methods, determinants of Working Capital, Working Capital Financing.

Module IV

Preparation of Financial Statements (10 hrs)

Ratio Analysis (Liquidity, Leverage and profitability ratio)
Funds Flow and Cash Flow Analysis.

Books:

1. Jain & Narang: Financial Accounting, Kalyani Publishers.
2. Maheswari: S.N.Management Accounting, Sultan Chand & Sons.

3rd SEMESTER MCA

SESSIONALS

MCA-291

OPERATING SYSTEM LABORATORY (0-0-6)

Shell Programming, Sed, awk, grep

Process creation and execution, interprocess communication

Process signaling

File system mounting, disk organization

Semafor, creation and management of shared memory among processes.

3rd SEMESTER MCA

SESSIONALS

MCA-292 COMPUTER GRAPHICS LABORATORY (0-0-6)

1. Introduction to Open GL Programming
2. Implementing line drawing Algorithms
3. Implementing Circle Drawing Algorithms
4. Implementing Ellipse Drawing Algorithms
5. Implementing Line Clipping Algorithm
6. Implementing Polygon Clipping Algorithm
7. Implementing 2-d Transformation
8. Implementing 3-d Transformation
9. Implementing Scan fill, Boundary fill Algorithms
10. Implementing Seed fill, flood fill algorithm
11. Writing Program on B-Splines, Bezier Curves
12. Writing Program on Animation & Morphing Techniques