

M.C.A.
II & III Year

Prospectus No. 121718

संत गाडगे बाबा अमरावती विद्यापीठ
SANT GADGE BABA AMRAVATI UNIVERSITY
(FACULTY OF ENGINEERING & TECHNOLOGY)

PROSPECTUS

Prescribed for

MASTER IN COMPUTER APPLICATION

Second Year Examination 2011-2012 &

Third Year Examination 2012-2013

CREDIT GRADE SYSTEM



2011

(Price Rs. 15/-)

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**SYLLABUS PRESCRIBED FOR THREE YEAR P.G. COURSE IN
MASTER IN COMPUTER APPLICATION**

CREDIT GRADE SYSTEM

SECOND YEAR

SEMESTER : FIRST

3MCA1

OPERATING SYSTEMS

- Unit-I:** Introduction: Operating System(OS) definition, OS Evolution, OS Components and Services. Process Concept, Process Scheduling, Operations on Processes, Cooperating Processes, Interprocess Communication, Threads Overview, Multithreading Models, Threading Issues, Java Threads.
- Unit-II:** CPU Scheduling Concepts, Scheduling Criteria and Algorithms. Process Synchronization: The Critical-Section Problem, Synchronization Hardware, Semaphores, Monitors. Deadlocks: Definition & Characterization, Deadlocks Prevention, Avoidance, Detection and Recovery from Deadlock.
- Unit-III:** Memory Management Background, Swapping, Contiguous Memory Allocation Schemes, Paging, Segmentation. Virtual Memory Management: Background, Demand Paging scheme, Process Creation, Page Replacement Policies, Allocation of Frames, Thrashing.
- Unit-IV:** File-System Interface; Directory Structure, File-System Mounting, File Sharing & Protection. File-System Structure, File-System Implementation. Directory Implementation, Allocation Methods, Free-Space Management. File Recovery.
- Unit-V:** I/O Systems :Overview, I/O Hardware, Application I/O Interface, and Kernel I/O Subsystem. Transforming I/O to Hardware Operations. Disk Scheduling, Disk Management, Swap-Space Management, RAID Structure.
- Unit-VI:** The Linux System; History, Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, File Systems, Input and Output, Interprocess Communication, Network Structure & Security in Linux.

Text Book:

Avi Silberschatz , P.B.Galvin, G Gagne : "Operating System Concepts" (Sixth Edition) John Wiley & Sons Publication.

References:

- i A.S Tanenbaum "Modern Operating Systems" Pearson Education.

- ii William Stallings "Operating Systems" Prentice-Hall.
- iii D M Dhamdhare "Operating Systems" Tata McGraw-Hill.
- iv M Milankovic "Operating Systems" McGraw-Hill.

3MCA 2

FILE STRUCTURES & DATA PROCESSING

- UNIT I.** Introduction : File structure design, File processing operations : open, close, read, write, seek. Unix directory structure. Secondary storage devices: disks, tapes, CD-ROM. Buffer management. I/O in Unix.
- UNIT II.** File Structure Concepts : Field & record organization, Using classes to manipulate buffers, Record access, Record structures. File access & file organization. Abstract data models for file access. Metadata. Extensibility, Portability & standardization.
- UNIT III.** Data Compression, Reclaiming spaces in files, Introduction to internal sorting and Binary searching. Keysorting. Indexing concepts. Object I/O. Multiple keys indexing., Inverted lists, Selective indexes, Binding.
- UNIT IV.** Cosequential processing : Object-Oriented model, its application. Internal sorting : a second look. File Merging : Sorting of large files on disks. Sorting files on tapes. Sort-merge packages. Sorting and Cosequential processing in Unix.
- UNIT V.** Multilevel indexing : Indexing using Binary Search trees. OOP based B-trees. B-tree methods Search, Insert and others. Deletion, merging & redistribution. B*trees. Virtual B-trees. VL records & keys. Indexed sequential file access and Prefix B+trees.
- UNIT VI.** Hashing : Introduction, a simple hashing algorithm. Hashing functions and record distributions. Collision resolution. Buckets. Making deletions. Pattern of record access. External hashing. Implementation. Deletion. Performance. Alternative approaches.

Textbook :

Michael J Folk, Bill Zoellick, Greg Riccard : File Structures : An Object-Oriented Approach using C++. (Addison-Wesley) (LPE)

References :

1. M.Loomis : Data Management & File Processing (PHI)
2. O.Hanson : Design of Computer Data Files McGraw-Hill (IE).
3. D. E. Knuth : "The Art of Computer Programming" Volume-3. Addison Wesley Pub.

3MCA3

JAVAPROGRAMMING

- Unit I: Java Basics: Program Components, Compilation cycle. Introduction to Applet and Application, Data types and Variables, Operators: Arithmetic, relational, Assignment operators. Control statement: Selection statement: if, nested if, switch statement. Repetition statements: while, do-while, for, nested loops.
- Unit II: Introducing classes, class fundamentals, declaring objects, methods, class data, & instance data, constructor, this keyword, access control, Inheritance, Polymorphism, Abstract classes and Interface, Packages. Introduction to String and String Buffer classes, Math class. Arrays: Basics, One - & Multi-dimensional, Array of Objects, Passing array to methods.
- Unit-III: Exception handling: Exception types, uncaught Exceptions, using try and catch, throw, throws, finally clauses, multiple catch clauses, Built-in Exceptions. Multithreaded programming: Java thread model, creating a thread, creating multiple threads, thread priorities & synchronization.
- Unit IV: Java I/O: Stream classes, Byte Stream & Character Streams: Input stream, Output stream, File Input stream, File Output stream, Data Input stream, Data Output stream, PrintWriter, The Applet class and its various methods, Passing parameters to applets. transient & volatile modifiers, using instanceof, using assert.
- Unit-V: Event handling: Event handling mechanisms, Delegation Event model, Event, Event sources & EventListeners, Event Classes, Event Listener Interfaces., Using delegation Event model: Handling mouse events, handling Keyboard events, Adapter classes, Inner classes, anonymous inner classes.
- Unit-VI: Introduction to AWT, AWT classes, Window fundamentals, working with frame windows, Button, TextField, Label. Working with Graphics, Working with colors, AWT controls, Fundamentals: Adding and removing controls, responding to controls. Layout managers.

TEXT BOOK:

Herbert Schildt: The Complete Reference Java 2 (5/e) (Tata-McGraw Hill)

3MCA7 JAVA Programming Lab.

REFERENCES

- 1) Liang "A Text Book of Java Programming" 2/e (PHI).

- 2) Dietel & Dietel "Java How to Program " Pearson Education.
- 3) Horstmann & Cornell "Core Java 2 " Vol-1. Sun Microsystems.
- 4) S. Chavan "Programming in Java" Shroff Pub.

3MCA4

COMPUTER NETWORKS

- UNIT – I Introduction: Brief history of computer networks & Internet, Layered architecture, Internet protocol stack, Network entities & layers, Application layer: Principles of protocols, HTTP, FTP, SMTP and DNS protocols.
- UNIT – II Transport layer: services & principles, multiplexing & demultiplexing applications, UDP, principles of reliable data transfer, TCP details, principles of congestion control, TCP congestion control.
- UNIT – III Network layer: network service model, routing principles, hierarchical routing, Internet Protocol (IP) & ICMP details, Routing in the Internet, Router internals, IPV6.
- UNIT – IV Link layer: Introduction, services, multiple access protocol, LAN addresses & Address Resolution Protocol, Carrier Sense Multiple Access / CD, Point-to -Point Protocol details.
- UNIT – V Network security issues, principles of cryptography, authentication & authentication protocol, version, integrity: digital signatures, message digests, hash function algorithm, key distribution & certification, secure e-mail.
- UNIT – VI Network Management: Basic principles, infrastructure for network management, The Internet Network –management framework: SMI, MIB, SNMP details, security and administration, ASN 1, Firewalls: Packet filtering and Application gateway.

TEXT BOOK:

1. James F. Kurose & K W Ross: Computer Networking, Pearson Education (LPE)

REFERENCES:

1. Douglas E. Comer: Computer Network & Internet, Addison Wesley.
2. Andrew S. Tanenbaum : Computer Networks, PHI (5E)
3. Leon Garcia & Widjaja: Communication Networks, TMH
4. William Stallings: Data & Computer Communication, Pearson Education.

3 MCA 5 COMPUTER ORIENTED OPTIMIZATION TECHNIQUES

- Unit I:** Introduction, Classification of problems, OR mathematical modeling, Dynamic programming, Investment problem, Equipment replacement, stage coach.
- Unit II:** Linear Programming: Introduction, concept of linear programming model, development of LP model, simplex method, Big M method, Duality theory, dual simplex method, Two phase method.
- Unit III:** Transportation & Assignment problem: Introduction to transportation problem, mathematical model, types of transportation problem, Optimization techniques for transportation problem, methods to find basic solution, Northwest Corner cell method, Least cost cell method, Vogel Approximation method, optimizing the basic feasible solution using U-V method. Assignment Problem: Introduction, zero-one programming model for Assignment problems, type of assignment problems.
- Unit IV:** Introduction to sequencing problem, Two machine, N job three machine sequencing problem, Introduction to Integer Programming, cutting plan Algorithm, branch & bound techniques, zero-one Implicit enumeration algorithm.
- Unit V:** Probability OR Model: Basic probability statistical concepts, Introduction to decision theory-minimax decision procedure, Bayes decision procedure with & without data, Regret function versus loss function
- Unit VI:** Introduction to Game Theory: minimax, maximum, pure strategies, mixed strategies & expected payoff, solution of 2x4 games, mx2 games, Brown's Algorithm. Introduction to PERT Network, ET, TE, TL, SE, critical path, probability of completing events on schedule.

TEXT BOOKS :

1. B.E Gillett, Introduction to Operation Research TMH Edition
2. R.Panneerselvam "Operation Research" PHI.

References :

1. J.K. Sharma "Operation Research" (2/e) Macmillan.
2. S.S. Rao Optimization Theory & Application Wiley
- 3 Tata Handy, " Operations Research- An Introduction" (5/e), PHI.
4. Taha H. A. "Operation Research" Macmillan.

3 MCA 6 F.S.D.P. - Lab

Laboratory: Programing project as given in the textbook should be implemented for each unit, and a project report (journal) should be submitted. Programming project should span over Chapters 1,2,4,6,7,8,9,10 and 12. This lab should be preferably based on Unix/Linux system.

3MCA7 JAVA PROGRAMMING LAB**LIST OF PROGRAMS**

The sample list of program is given below. This list can be used as guide line for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

- | S. No | Name of Program | |
|-------|---|------------------------------|
| 1 | Write a Java application to print a given format | * * * *
* * *
* *
* |
| 2 | Design an Applet to Draw a String inside a Pentagon with specified font and color | |
| 3 | Write an Java application for Loan Calculator | |
| 4 | Write an Applet that accepts the user name via Text Field object. When user presses the Enter Key the Applet displays a "Welcome <user name>" with <user name> replaced with actual name entered by user. | |
| 5 | Write an Applet that displays a BMI of a person given his or her weight in Kilogram and height in Meters | |
| 6 | Write an Application program in Java using Switch statement to print A-Z, a-z, 0-9 by inputting ASCII value of first character | |
| 7 | Write an application in Java which reads a string from user as a command line argument and checks the string for vowels, and when the vowel encounters it append the word "egg" before each vowel | |
| 8 | Write an application in Java to design "Simple Calculator" | |
| 9 | Write an application in Java which creates an AddressBook class which manages collection of Person object and allows programmer to add, delete, search a Person object in the Address Book | |
| 10 | Write an application in Java which reads and writes User defined Byte Array from and to a file using Low Level File I/O. | |
| 11 | Write an application in Java which creates a File menu on Frame with menuitem "DialogBox".
When user clicks on menu Item one Dialog Box will appear on the Frame with one TextField and two Buttons "OK" and "CANCEL". | |

After entering the data in the TextField and clicking the OK Button Dialog Box closes and data will appear on a Frame Window and when presses CANCEL Button Dialog Box closes and control comes back on Frame Window

- 12 Write an application in Java which return current x,y coordinates when any mouse button is Pressed and draws freehand drawing when mouse is Dragged.

3MCA8 C.O.O. T-Lab Based on 3MCA5

3MCA9 COMPUTERLAB-III

This laboratory is based on Operating systems. The laboratory may be based either on Windows or Linux.

Minimum Eight (08) of the following laboratory assignments should be completed and submitted in the form of journal. The external examination shall be based on the programming assignment of any of these modules with via-voce.

- i. Managing multiple processes/tasks.
- ii. Writing Multithreaded Software.
- iii. Manipulating Kernel Objects.
- iv. Thread Synchronization.
- v. Interprocess Communication.
- vi. Memory Management.
- vii. File Systems & Directories
- viii. File Accessing
- ix. Network Programming
- x. I/O Programming & Device Drivers.

Text-books:

- i. Gary Nutt. " Operating System Projects Using Windows-NT" (Pearson Education)
- ii. D.P.Bovet & M. Cesati " Understanding the LINUX Kernel" (3/e) O'Reilly, Shroff Publishers.

SECOND YEAR SEMESTER: SECOND

4MCA1 DATABASE MANAGEMENT SYSTEMS

- Unit-I: Database System Applications, Database Systems versus File Systems, View of Data, Data Models, Database Languages, Database Users and Administrators, Transaction Management, Database System Structure, Application architectures, History of Database Systems. Entity-Relationship Model, Basic Concepts, Constraints, Keys, Design Issues, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R Features, Design of an E-R Database Schema, Reduction of an E-R Schema to Tables.
- Unit-II: Relational Model: Structure of Relational Databases, The Relational Algebra, Extended Relational-Algebra Operations, Modification of the Database, Views, The Tuple Relational Calculus, The Domain Relational Calculus, SQL: Basic Structure, Set Operations, Aggregate Functions, Null Values, Nested Subqueries, Views.
- Unit-III: Integrity and Security, Domain Constraints, Referential Integrity, Assertions, Triggers, Security and Authorization, Authorization in SQL, Encryption and Authentication, Relational-Database Design, First Normal Form, Pitfalls in Relational-Database Design, Functional Dependencies, Decomposition, BCNF, Third, Fourth and more Normal Forms, Overall Database Design Process.
- Unit-IV: Query Processing: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions, Query Optimization: Overview, Estimating Statistics of Expression Results, Transformation of Relational Expressions, Choice of Evaluation Plans, Materialized Views.
- Unit-V: TRANSACTIONMANAGEMENT: Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Execution, Serializability, Recoverability, Implementation of Isolation, Transaction Definition in SQL, Testing for Serializability.
- Unit-VI: Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols, Validation-Based Protocols, Multiple Granularities, Multiversion Schemes, Deadlock Handling, Insert and Delete Operations Weak Levels of Consistency, Concurrency in Index Structures. Recovery System, issues & solutions.

TEXT BOOK:

Korth, Sudarshan : Database System Concepts , McGraw Hill, 4th Edition

REFERENCES:

1. Raghu Ramkrishnan :Database System (TMH)
2. C.J.Date : Database System, 7th ed., (Pearson Education)
3. Connolly & Begg, : Database System, Low Price Ed. (Pearson Education)
4. Navathe & Elmasri , Fundamentals of Database Systems. 4/e (Pearson Education).

4MCA 2**CLIENT SERVER COMPUTING**

- UNIT-I** Networking in Java: Basics, Socket Overview, Client/Server concepts, Proxy servers, Internet addressing, Java Networking classes & interfaces, InetAddress, TCP/IP Client sockets, URLConnection, TCP/IP Server sockets. Creating TCP client/server.
- UNIT-II** Java Database Connectivity, JDBC Concepts, JDBC API, DriverManager, Connection, Statement and ResultSet classes with relevant methods. Prepared & callable statements, Handling queries, inserts, deletes and updates to database. Displaying the query results.
- UNIT III** Introduction to XML; Writing XML, Well-formed XML documents, creating a DTD, Elements, Attributes & Entities definitions. Validation of documents, XML schema. Defining simple & complex types. Namespaces, schemas and validation. DOM & SAX programming models, Cascading Style Sheets (CSS) & XML.
- UNIT IV** Servlets in Java; Servlet structure & lifecycle. Servlet API basics, Various classes & interfaces. Servlet requirements, writing. Running and debugging of Servlets, Concepts of Cookies, Servlets & cookies. State and session management with Servlet API. Server side includes and request forwarding. Servlet chaining. Jdbc Servlets.
- UNIT V** Remote Method Invocation (RMI): Object serialization in Java, Concept of remote object, Architecture of RMI application, Java RMI package, classes & Interfaces, Client/Server application using RMI, RMI Servlets, RMI-JDBC Servlets.
- UNIT VI** Introduction to JSP; Simple JSP concepts, Request-time expressions. Advanced JSPs: Scripts. conditionals, loops, Try/Catch. Concept of Beans, Properties, Bean instances &

serialization; Bean Scopes, Writing Beans, Introspection, Beans & Scriptlets..

Books:

1. Dustin R Callaway: Inside Servlets Pearson Education (LPE)
2. XML Related Technologies and Programming in Java by IBM EEE (PHI).
3. Larnie Pekowasky: Java Server Pages, Pearson Education (LPE)
4. Dietel & Dietel: WWW: How To Program, Pearson Education (LPE)
5. Dietel, Nieto, Lin, Sadhu : XML: How to Program, Pearson Education.
6. Horstmann & Cornell "Core Java 2" Vol-1 & Vol. II., Sun Microsystems.

4MCA 3**MULTIMEDIA TECHNOLOGIES**

- UNIT I.** Multimedia Authoring and Data Representations: Introduction. Components of Multimedia. Hypermedia and Multimedia. Overview of Multimedia Software Tools, Multimedia Authoring, VRM. Graphics and Image Data Representations: 1-Bit Images, 8-Bit Gray-Level Images, 24-Bit Color Images, 8-Bit Color Images, Color Lookup Tables, Popular Image File Formats.
- UNIT II.** Color in Image and Video Color Science, Color Models in Images, Color Models in Video. Fundamental Concepts in Video: Types of Video Signals, Component Video, Composite Video, S-Video, Analog Video, NTSC Video, PAL Video, SECAM Video, Digital Video.
- UNIT III.** Basics of Digital Audio: Digitization of Sound, Digitization, Nyquist Theorem, Signal-to-Noise Ratio (SNR), Signal-to-Quantization-Noise Ratio (SQNR), MIDI: Musical Instrument Digital Interface. Hardware Aspects of MIDI, Structure of MIDI Messages, General MIDI, MIDI-to-WAV Conversion.
- UNIT IV.** Multimedia Data Compression: Lossless Compression Algorithms: Basics of Information Theory, Run-Length Coding, Variable-Length Coding, Dictionary-Based Coding, Arithmetic Coding, Lossy Compression Algorithms: Introduction, Distortion Measures, Quantization, Uniform Scalar Quantization, No uniform Scalar Quantization, Image Compression Standard: The JPEG Standard.
- UNIT V.** Basic Video Compression Techniques: Introduction, Video Compression Based on Motion Compensation, Search for

Motion Vectors, H.261 Encoder and Decoder, MPEG-1, Motion Compression in MPEG-1, MPEG-2, Supporting Interlaced Video, MPEG-2 Scalabilities, Other Major Differences from MPEG-1.

UNIT VI Basic Audio Compression Techniques: ADPCM in Speech Coding, Vocoders, Phase Insensitivity, Channel Vocoder, Format Vocoder, Linear Predictive Coding. Audio Compression: Psychoacoustics, Equal-Loudness Relations, Frequency Masking, Temporal Masking, MPEG Audio, MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithm.

Text Book:

Ze-Nian, Li, Mark S. Drew "Fundamentals of Multimedia" (Pearson Education)

References:

1. Rajan Parekh "Principles of Multimedia" (Tata McGraw-Hill)
2. S.J. Gobbs & D.C. Tsichritzis "Multimedia Programming". Addison Wesley 1995
3. P.W. Agnew & A.S. Kellerman "Distributed Multimedia". Addison Wesley 1996
4. F. Fluckiger, "Understanding Networked Multimedia". Prentice-Hall 1995

4MCA 4 ELECTRONIC COMMERCE

UNIT-I History of e-commerce, Advantages & disadvantages of e-commerce, Indian business context, IT Act 2000, E-business models: based on the relationship of transaction Parties & Transaction Types. Examples of various e-business models in practice.

UNIT-II Enabling technologies of the WWW, Internet client/server applications, Networks & Internet, Software agents, ISPs, E-Marketing: Identifying Web Presence Goals, Browsing Behavior Model, Online marketing, E-advertising, E-branding, Marketing strategies.

UNIT-III E-security: security on the Internet, E-business risk management issues, E-Payment systems: digital payment requirements, digital-token-based e-payment systems, classification of new payment systems, properties of E-cash, Cheque payment system, risk & e-payment system, Designing of e-payment system, digital signature.

UNIT-IV E-customer relationship management, E-CRM solutions, E-CRM toolkit, Typical business touchpoints, CRM & workflow automation. E-Supply chain management: supply chain, E-logistics, examples of smart chains, ways to reduce inventory, E-SCM advantage & benefits, E-Supply chain components, architecture and trends in E-SCM.

UNIT-V E-Strategy: Information & Strategy, Virtual value chain, seven dimensions of e-commerce strategy, Value chain & E-strategy, Planning the e-commerce project, E-commerce strategy & knowledge management. E-business strategies, data warehousing and data mining.

UNIT-VI Mobile commerce: Growth & success, wireless applications. Technologies for mobile commerce, origin of WAP, WAP programming model, Wireless technologies, Different generations in wireless technologies, security issues to cellular technologies, M-Commerce in India.

Text Book:

P.T Joseph, S.J. "E-Commerce: An Indian Perspective" (2/e) (PHI)

Reference Books

1. Trepper C. "E-commerce Strategies" Prentice-Hall.
2. Thakkar M. "E-commerce Applications using Oracle8 & Java" Prentice-Hall.
3. Bill Brogden & Chris Minnick "Java Developers' Guide to E-Commerce with XML & JSP" (BPB).
4. D. Minoli & E. Minoli: Web Commerce Technology Hand Book (TMH).

**4MCA 5 ELECTIVE - I
(I) COMPUTER GRAPHICS**

Unit I: An overview of Computer Graphics and Graphics System : Video display devices, Raster-Scan systems, Random-Scan systems, Graphics monitors and workstations, input devices, hard copy devices, Graphics software..

Unit II: Output primitives : Point and Lines, Line drawing algorithms, loading the frame buffer, line function, circle and ellipse generating algorithms, curves, parallel curves algorithms, Pixel addressing, filled-area primitives , functions, Cell array, character generation.

Unit III: Attributes of output primitives : Line and curve attributes, color and grayscale levels, area fill attributes. Character attributes, bundled attributes, antialiasing.

- Unit IV: 2-D geometric transformations : basic transformations, matrix representations, composite transformations, other transformations, transformations between coordinate systems, affine transformations, transformation functions, Raster methods for transformations. Two-Dimensional viewing : viewing coordinates, Window-to-viewport coordinate transformation, viewing functions, clipping : point, line, polygon, curve, text, exterior.
- Unit V: Structures and hierarchical modeling : concepts, editing structures, basic modeling concepts, hierarchical modeling, GUI and interactive input methods : the user dialogue, input of graphical data, functions, initial values for input device parameters, interactive picture - construction techniques, virtual reality environments.
- Unit VI: Three dimensional concepts : display methods, graphics, Bezier curves and surfaces, B-spline curves and surfaces, Beta-splines, three dimensional geometric and modeling transformations : translation, rotation, scaling, three dimensional viewing : viewing pipeline, viewing coordinates, projections.

TEXT BOOK :

D. Hearn, M.P.Baker : Computer Graphics, II edition (Pearson Education)

REFERENCES:

- 1) F.S.Hill : Computer Graphics Using Open GL, II edition (Pearson Education)
- 2) W.M.Newman & R.F.Sproul : Principles of Interactive Computer Graphics, 2/e, (McGraw Hill)
- 3) F.S.Hill : Computer Graphics (Macmillan)
- 4) Harington : Computer Graphics (McGraw Hill)

4MCA 5**ELECTIVE-I****(2) MODELING & SIMULATION**

- UNIT – I System Models and System studies: Basic concepts of systems and system modeling static and dynamic/physical and mathematical models-principles used in modeling-corporate models- analysis, design and postulation of system.
- UNIT – II Basic Concepts and continuous system : Techniques used-distributed log models and cobweb models continuous system Model- Analytical equations and methods of

- obtaining solutions –analog and hybrid computers and simulations CSSLS examples of different continuous system
- UNIT – III System dynamics, probability concepts and basic principles of discrete simulation Growth and decay models system dynamics diagrams examples-stochastic Process-probability functions and their evaluation-random number generation-rejection method-comparison of Monte-Carlo method and stochastic simulation-examples.
- UNIT – IV Simulation of Queuing System and PERT Network
- Simulation of Queuing system: Rudiments of queuing theory, simulation of a single server queue, simulation of a two server queue, simulation of more general queues. Simulation of a PERT Network: Network model of a project, Analysis of an activity network, critical path
- UNIT – V Simulation of Inventory Control & Forecasting Design and Evaluation of Simulation Experiments Inventory Control and Forecasting: Elements of inventory theory, more Complex inventory models, simulation example=1, Generation of Poisson and Erlanger variates, Simulation example- 2, Forecasting and regression Analysis. Design and Evaluation of simulation Experiments: Length of Simulation runs, variance reduction techniques, Experimental layout, Validation, summary and conclusion.
- UNIT – VI Simulation of Languages and Introduction to GPSS
- Different special purpose languages used for continuous and discrete systems and comparison –factors affecting the selection of discrete system simulation languages-comparison of GPSS and SIMSCRIPT. A detailed study of GPSS with examples.

TEXT BOOKS:

1. Geoffrey Gordon "System Simulation", II Edition, PHI Pvt Ltd., New Delhi- 1987.
2. Narsingh Deo, "System Simulation with Digital Computers" PHI Pvt Ltd., New Delhi.

REFERENCES:

1. Shannon R.E., "System Simulation: The Art of Science" Prentice Hall, Englewood Cliffs, NY, 1975.
2. Hugh j. Watson, John H. Blackstone, Jr., "Computer Simulation" 2nd Edition, John Wiley & Sons.
3. James A. Payne "Introduction to Simulation: Programming Techniques and Methods of Analysis" McGraw Hill.

4MCA 6 DATABASE MANAGEMENT SYSTEMS LABORATORY

The sample list of programs based on ORACLE or MY SQL is given below. Aim of the list is to inform about minimum expected outcomes.

1. Consider the employee database, where the primary keys are underlined & Write the Queries using following clauses & also retrieve the data from the given database.
Employee (employee-name, street, city)
Works (employee-name, company-name, salary)
Company (company-name, city)
Manages (employee-name, manager-name)
I) Order By II) Between III) Group By IV) Having
2. Consider the above database & perform the different Join Operations which are as follows.
I) Inner Join II) Left Outer Join III) Right Outer Join IV) Full Outer Join
3. Consider the above database & Perform the different Set Operations Which are as follows.
I) Union II) Intersect III) Except/Minus
4. Consider the above database & perform the all Aggregate Functions.
5. Write an assertion for the bank database to ensure that the assets value for the 'perryridge' branch is equal to the sum of all amounts lent by the 'perryridge' branch.
Customer (customer-name, customer-street, customer-city)
Branch (branch-name, branch-city, asstes)
Loan (loan-number, branch-name, amount)
Borrower (customer-name, loan-number)
Depositor (customer-name, account-number)
Account (account-number, branch-name, balance)
6. Write an SQL trigger to carry out the following action: On delete of an account, for each owner of the account, check if the owner has any remaining accounts, and if she does not, delete her from the depositor relation.
7. Consider the above Bank database & write the SQL queries for the following views:
i) A view containing the account numbers the customer names for all accounts at the deer park branch. ii) A view containing the names and addresses of all customers who have an account with the bank, but do not have a loan.
8. Mini Project Using Oracle 9i & VB6 / VB.Net.

4MCA 7 CLIENT SERVER COMPUTING LAB

LIST OF PROGRAMS

The sample list of program is given below. This list can be used as guide line for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. Write programs to study concept of client-Server system, working of Client, working of Server and kinds of Client- Server using Java Sockets.
2. Write programs to study concept of JDBC, connect to database, insert a row into a table through JDBC, query the table(s), and display the result of query through JDBC.
3. a) Introduction to Servlet that describe the Servlet Life cycle with various Http methods, Advantages of Servlet user CGI.
b) Write a simple Servlet oriented program to print "Hello World" on a client machine. Repeat this with RMI-servlet.
4. Write a program to create cookies that accepts Personal information in a Form from the user and whenever the user clicks "Submit" button cookie will be sent and when the user retrieves cookie from his site the values sent in the cookie should be display on the HTML page
5. (a) Write a program to design and implement customer Registration system which allows you (Customers) to register them with your site. The data is captured by Servlet and stored in the database using JDBC.
(b) Repeat this exercise with RMI.
6. (a) Write a program using Session that selects the programming language and when Submit button is clicked a page with Session information gets displayed along with the information for selecting another language and other to get recommended books which displays the requested page when clicked.
(b) Repeat this exercise with RMI.
7. Write programs to create a DTD for Library System, DTD for e-commerce application.
8. Write a program to create a Bean that will create a Rectangle with color property in it and set its various properties like Height, width etc.
9. Write a program to implement the program for Quiz using JSP.
10. Implement one mini Project using Servlets, Cookies, JDBC, JSP.

4MCA 8 MULTIMEDIA TECHNOLOGIES LABORATORY:

Minimum Eight experiments/programming assignments must be completed based on the respective syllabus covering each of the units.

4 MCA 9 E Commerce Laboratory: The lab shall be based on the following programming-cum-development assignments:

- i. A catalog in XML. ii. Presenting the catalog online. iii. Filling a shopping cart.
- iv. Billing & Order confirmation. v. Online catalog upkeep.
- vi. Using surveys to know the customers. vii. News on the e-commerce sites.

Text-book for 4MCA9 labs is:

Bill Brogden & Chris Minnick "Java Developers' Guide to E-Commerce with XML & JSP" (BPB).

4MCA10 Seminar

The seminar should be based on the recent trends in computing and the applications. Each student should carry out the literature survey through Internet to identify the current trends in computer applications. The survey should culminate into an application that truly reflects the use of computing in that domain. The seminar report should be prepared based on the technical aspects of the application rather than the description of application.

The candidate shall deliver the seminar for minimum fifteen minutes followed by the question answer session. The marks distribution for the seminar shall be as follows:

Seminar Report			Seminar Presentation			
Contents	Format	Topic Coverage	English Communication	Presentation Style	Question Answer Session	Attendance in all the seminar sessions
05	05	05	05	05	15	10

APPENDIX-A
THREE YEAR POST GRADUATE DEGREE COURSE IN MASTER IN COMPUTER APPLICATION
SEMESTER PATTERN
CREDIT GRADE SYSTEM
SECOND YEAR SEMESTER-I

Sr.No.	Subject Code		Teaching Scheme					Examination Scheme								
			Hours/Week					Theory			Practical					
			Lecture	Tutorial	P/D	Total Hours/Week	Credits	Duration of Paper (Hr)	Max. Marks Theory Paper	Max. Marks College Assessment	Total	Min. Passing Marks	Max. Marks External	Max. Marks Internal	Total	Min. Passing Marks
1	3MCA1	Operating Systems	4	0	0	4	4	3	80	20	100	40	-	-	-	-
2	3MCA2	File Structure & Data Processing	4	0	0	4	4	3	80	20	100	40	-	-	-	-
3	3MCA3	Java Programming	4	0	0	4	4	3	80	20	100	40	-	-	-	-
4	3MCA4	Computer Networks	4	0	0	4	4	3	80	20	100	40	-	-	-	-
5	3MCA5	Computer Oriented Optimization Techniques	4	0	0	4	4	3	80	20	100	40	-	-	-	-
6	3MCA6	File Structure & Data Processing-Lab.	0	0	2	2	1	-	-	-	-	-	25	25	50	25
7	3MCA7	Java Programming-Lab.	0	0	2	2	1	-	-	-	-	-	25	25	50	25
8	3MCA8	Computer Oriented Optimization Techniques-Lab.	0	0	2	2	1	-	-	-	-	-	25	25	50	25
9	3MCA9	Computer Lab-III	0	0	4	4	2	-	-	-	-	-	50	50	100	50
TOTAL			20	0	10	30	25				500				250	
														TOTAL : 750		

APPENDIX-A
THREE YEAR POST GRADUATE DEGREE COURSE IN MASTER IN COMPUTER APPLICATION
SEMESTER PATTERN
CREDIT GRADE SYSTEM
SECOND YEAR SEMESTER-II

Sr.No.	Subject Code	Teaching Scheme						Examination Scheme								
		Hours/Week				Credits	Duration of Paper (Hr.)	Theory			Practical		Total	Min. Passing Marks		
		Lecture	Tutorial	P/D	Total Hours/Week			Max. Marks Theory Paper	Max. Marks College Assessment	Total	Min. Passing Marks	Max. Marks External			Max. Marks Internal	
1	4MCA1	Database Management Systems	4	0	0	4	4	3	80	20	100	40	-	-	-	-
2	4MCA2	Client Server Computing	4	0	0	4	4	3	80	20	100	40	-	-	-	-
3	4MCA3	Multimedia Technologies	4	0	0	4	4	3	80	20	100	40	-	-	-	-
4	4MCA4	Electronic Commerce	4	0	0	4	4	3	80	20	100	40	-	-	-	-
5	4MCA5	Elective-I	4	0	0	4	4	3	80	20	100	40	-	-	-	-
6	4MCA6	Database Management Systems-Lab.	0	0	2	2	1	-	-	-	-	-	25	25	50	25
7	4MCA7	Client Server Computing-Lab.	0	0	2	2	1	-	-	-	-	-	25	25	50	25
8	4MCA8	Multimedia Technologies-Lab.	0	0	2	2	1	-	-	-	-	-	25	25	50	25
9	4MCA9	Electronic Commerce-Lab.	0	0	2	2	1	-	-	-	-	-	25	25	50	25
10	4MCA10	Seminar	2	0	0	2	1	-	-	-	-	-	--	50	50	25
TOTAL			22	0	8	30	25				500				250	
TOTAL : 750																

Elective-I : 1) Computer Graphics 2) Modelling & Simulation