Adikavi Nannaya University

Branch/Course: Master of Computer Applications

Semester II (First Year) Curriculum

Code	Course Title	Max Marks		Total Marks	Hours per week		Credits
		External	Internal		Theory	Practical	
MCA-19201	Probability Statistics and Queuing Theory	75	25	100	4	-	4
MCA-19202	Information Systems and Organizational Behavior	75	25	100	4	-	4
MCA-19203	Object Oriented Programming through JAVA	75	25	100	4	-	4
MCA-19204	Formal Languages and Automata Theory	75	25	100	4	-	4
MCA-19205	Web Technologies	75	25	100	4	-	4
MCA-19206	Object Oriented Programming through JAVA Lab	50	50	100	-	3	2
MCA-19207	Web Technologies Lab	50	50	100	-	3	2
	Total Credits						24

MCA-19201 PROBABILITY, STATISTICS & QUEUING THEORY

Instruction: 4 Periods/week | Time: 3 Hours | Credits: 4
Internal: 25 Marks | External: 75 Marks | Total: 100 Marks

UNIT I:

Probability: Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Bayes' Theorem of Probability.

Random variables and their properties: Discrete Random Variable, Continuous Random Variable, Probability Distribution, Joint Probability Distributions their Properties, Transformation Variables, Mathematical Expectations, Probability Generating Functions.

UNIT II:

Probability Distributions: Discrete Distributions: Binomial, Poisson and Their Properties; Continuous Distributions: Uniform, Normal, Exponential Distributions and Their Properties. Multivariate Analysis: Correlation, Correlation Coefficient, Rank Correlation, Regression Analysis, Attributes, Coefficient of Association, Chisquare – Test For Goodness Of Fit, Test For Independence.

UNIT III:

Estimation: Sample, Populations, Statistic, Parameter, Sampling Distribution, Standard Error, Un-biasedness, Efficiency, Maximum Likelihood Estimator, Notion & Interval Estimation. Testing of Hypothesis: Formulation of Null hypothesis, critic al region, level of significance, power of the test;

UNIT IV:

Sample Tests: Small Sample Tests: Testing equality of means, testing equality of variances, Large Sample tests : Tests based on normal distribution

Queuing Theory: Queue description, characteristics of a queuing model, study state solutions of M/M/1:∞ Model, M/M/1 : N Model,

TEXT BOOKS :

1. Probability & Statistics for Engineers and Scientists,Walpole, Myers, Myers, Ye. Pearson Education.
2. Probability, Statistics and Random Processes T.Veerarajan Tata McGraw – Hill

REFERENCE BOOK:

1. Probability & Statistics with Reliability, Queuing and Computer Applications, Kishor S. Triv edi, Prentice Hall of India ,1999

MCA-19202 INFORMATION SYSTEMS & ORGANIZATIONAL BEHAVIOUR

Instruction: 3 Periods/week Time: 3 Hours Credits: 4
Internal: 25 Marks External: 75 Marks Total: 100 Marks

UNIT I

Organization Structure: Features of Good Organization Structures, Designing of Organization Structure, Types of Organization Structures- Functional, Product, Geographic and Matrix Organization Structures

UNIT II

Motivation: Nature and importance of motivation, Theories of motivation – Maslow's, Herzberg's and Mc Gregor's X and Y Theories of Motivation. Leadership: Meaning and definition, Importance of Leadership, Leadership styles, Communication: Process of Communication, Importance, Forms of Communication and Barriers in Communication.

UNIT III

Group Dynamics: Types of Groups, Stages of Group Development, Group Behavior and Group Performance Factors. Organizational Conflicts: Reasons for Conflicts, Consequences of Conflicts in Organizations, Types of Conflict, Strategies for Managing Conflicts, Organizational Climate and Culture.

UNIT IV

Management Information System: Nature and Scope, Characteristics and Functions. Classification of MIS - Transaction Processing System, Management Information System, Decision Support System, Executive Support System, Office Automation System and Business Expert System.

TEXT BOOKS:

1. Elements of Organizational Behavior, Robbins, 7th Edition, Pearson Education
2. Management Information Systems – D.P.Goyal, Macmillan Publishers India Ltd.

REFERENCE BOOKS:

1. Organizational Behaviour – L.M.Prasad, Sultan Chand and sons
2. Management Information Systems - L.M.Prasad, Usha Prasad , Sultan Chand and sons
3. Management Information Systems – Kanter Jerma , PHI

MCA-19203 Object Oriented Programming through JAVA

Instruction: 4 Periods/week	Time: 3 Hours	Credits: 4
Internal: 25 Marks	External: 75 Marks	Total:100 Marks

UNIT I

Introduction to OOP :Introduction, Principles of Object Oriented Languages, Applications of OOP, Programming Constructs: Variables, Primitive Datatypes, Identifiers- Naming Coventions, Keywords, Literals, Operators-Binary, Unary and ternary, Expressions, Precedence rules and Associativity, Primitive TypeConversion and Casting, Flow of control- Branching, Conditional, loops. Classes and Objects- classes, Objects, Creating Objects, Methods, constructorsConstructor overloading, cleaning up unused objects-Garbage collector, Class variable and Methods-Static keyword, this keyword, Arrays, Command line arguments.

Inheritance: Types of Inheritance, Deriving classes using extends keyword, Method overloading, super keyword, final keyword, Abstract class.

UNIT II

Interfaces, Packages and Enumeration: Interface-Extending interface, Interface Vs Abstract classes, Packages-Creating packages, using Packages, Access protection, java.lang package. Exceptions & Assertions – Introduction, Exception handling techniques- try… catch, throw, throws, finally block, user defined exception, Exception Encapsulation and Enrichment, Assertions.

UNIT III

MultiThreading: java.lang.Thread, The main Thread, Creation of new threads, Thread priority, Multithreading- Using isAlive () and join (), Syncronization, suspending and Resuming threads, Communication between Threads Input/Output: reading and writing data, java.io package, Applets– Applet class, Applet structure, An Example Applet Program, Applet : Life Cycle, paint(), update() and repaint(),

UNIT IV

Event Handling -Introduction, Event Delegation Model, java.awt.event Description, Sources of Events, Event Listeners, Adapter classes, Inner classes.

Abstract Window Toolkit :Why AWT?, java.awt package, Components and Containers, Button, Label, Checkbox, Radio buttons, List boxes, Choice boxes, Text field and Text area, container classes, Layouts, Menu, Scroll bar, Swing: Introduction, JFrame, JApplet, JPanel, Components in swings, Layout Managers, JList and JScroll Pane, Split Pane, JTabbedPane, Dialog Box Pluggable Look and Feel.

Text Books:

1. The Complete Refernce Java, 8ed, Herbert Schildt, TMH
2. Programming in JAVA, Sachin Malhotra, Saurabh choudhary, Oxford.

References:

1. JAVA for Beginners, 4e, Joyce Farrell, Ankit R. Bhavsar, Cengage Learning.\

2. Introduction to Java rogramming, 7th ed, Y Daniel Liang, Pearson.

MCA-19204 FORMAL LANGUAGES & AUTOMATA THEORY

Instruction: 4 Periods/week | Time: 3 Hours | Credits: 4
Internal: 25 Marks | External: 75 Marks | Total: 100 Marks

UNIT-I

Finite Automata and Regular Expressions: Basic Concepts of Finite State Systems, Chomsky Hierarchy of Languages, Deterministic and Non-Deterministic Finite Automata, Finite Automata with ϵ-moves, Regular Expressions.

Regular sets &Regular Grammars: Basic Definitions of Formal Languages and Grammars, Regular Sets and Regular Grammars, Closure Properties of Regular Sets, Pumping Lemma for Regular Sets, Decision Algorithm for Regular Sets, Minimization of Finite Automata.

UNIT-II

Context Free Grammars and Languages: Context Free Grammars and Languages, Derivation Trees, simplification of Context Free Grammars, Normal Forms, Pumping Lemma for CFL, Closure properties of CFL's.

Push down Automata: Informal Description, Definitions, Push-Down Automata and Context free Languages, Parsing and Push-Down Automata.

UNIT-III

Turing Machines: The Definition of Turing Machine, Design and Techniques for Construction of Turing Machines, Combining Turing Machines.

Universal Turing Machines and Undecidability: Universal Turing Machines. The Halting Problem, Decidable & Undecidable Problems - Post Correspondence Problem.

UNIT-IV

The Propositional calculus: The Prepositional Calculus : Introduction – Syntax of the Prepositional Calculus – Truth-Assignments – Validity and Satisfiability – Equivalence and Normal Forms – resolution in Prepositional Calculus.

The Predicate calculus: Syntax of the Predicate Calculate Calculus – Structures and Satisfiability – Equivalence – Un-solvability and NP-Completeness.

TEXT BOOKS:

1. Introduction to Automata Theory, Languages and Computations – J.E. Hopcroft, & J.D. Ullman , Pearson Education Asia.

2. Elements of The Theory Of Computation, Harry R Lewis, Cristos h. Papadimitriou, Pearson Education / Prentice-Hall of India Private Limited.

REFERENCE BOOKS:

1. Introduction to languages and theory of computation – John C. Martin (MGH)

2. Theory of Computation, KLP Mishra and N. Chandra Sekhar, IV th Edition, PHI

3. Introduction to Theory of Computation – Michael Sipser (Thomson Nrools/Cole)

MCA-19205 WEB TECHNOLOGIES

Instruction: 4 Periods/week Time: 3 Hours Credits: 4

Internal: 25 Marks External: 75 Marks Total: 100 Marks UNIT I

Networking Protocols and OSI Model: Protocols in Computer Communications, the OSI Model, OSI Layer Functions

Internetworking Concepts, Devices, Basics, History and Architecture: Internetworking, Problems in Internetworking, Dealing with Incompatibility Issues, A Virtual Network,

Internetworking Devices, Repeaters, Bridges, Routers, Gateways, A Brief History of the Internet, Growth of the Internet, Internet topology, Internal Architecture of an ISP

TCP/IP Part I (Introduction to TCP/IP, IP, ARP, RARP, ICMP):TCP/IP Basics, Why IP Addresses? Logical Addresses,TCP/IP Example The Concept of IP Address, Address Resolution Protocol (ARP), Reverse ARP, Internet Control Message Protocol (ICMP), Datagram, Fragmentation and Reassembly

UNIT II

TCP/IP Part II (TCP, UDP):Basics of TCP, Features of TCP, Relationship between TCP and IP, Ports and Sockets, Connections-Passive Open and Active Open, TCP connections, What Makes TCP Reliable? TCP Packet Format, Persistent TCP Connections, User Datagram Protocol , UDP Packet, Difference between UDP and TCP

TCP/IP Part III (DNS, Email, FTP, TFTP): Domain Name System (DNS), Electronic Mail (Email), File Transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP)

TCP/IP Part IV (WWW, HTTP, TELNET): A Brief History of WWW, Basics of WWW and Browsing, Locating Information on the Internet, HTML , Web Browser Architecture, Web Pages and Multimedia, Remote Login (TELNET).

An Introduction to Electronic Commerce: Aspects of Electronic Commerce, Types of E Commerce, Approaches for Developing E Commerce Solutions, Electronic Procurement, Phases in a Procurement Process, E-Procurement Models, E-Procurement Solutions, Trading Models, Buyer Side Purchasing, Supply Chain Management (SCM) and Customer Relationship Management (CRM)

UNIT III

Introduction to Web Technology: Features Required for Enabling e-commerce, Web pagesTypes and Issues, Tiers, The Concept of a Tier, A Concept of Microsoft and Java Technologies, Web Pages, Static Web Pages, Plug-ins, Introduction to Frames and Forms

Dynamic Web Pages: Need for Dynamic Web Pages,Magic of Dynamic Web Pages, Overview of Dynamic Web Page Technologies, Overview of Dynamic HTML (DHTML), Common Gateway Interface (CGI), Microsoft's Active Server Pages (ASP), Basics of ASP Technology, ASP Example, Modern Trends in ASP, Java and the Concept a Virtual Machine, Java Servlets and Java Sever pages(JSP), Java Servlets, Java Sever pages (JSP).

Active Web pages:Active Web pages is a Better Solution, Java Applets, Why are Active Web Pages Powerful? When not to use Active Web Pages, Lifecycle of Java Applets, Java Beans, Active X Controls.

UNIT IV

Middleware and Component-based E-commerce Architectures:CORBA, Java Remote Method Invocation (RMI), Microsoft's Distributed Component Object Model

Electronic Data Interchange (EDI): An Overview of EDI, the Origins of EDI, Understanding EDI, Data Exchange Standards, EDI Architecture, The Significance of EDI in International Trade, Financial EDI, EDI and the Internet.

Extensible Markup Language (XML): Standard Generalized Markup Language (SGML), Basics of XML, XML parsers, The Need for a Standard.

Wireless Application Protocol (WAP):Limitations of Mobile Devices, The emergence of WAP, WAP Architecture, The WAP Stack, Concerns about WAP and its Future, Alternatives to WAP.

Text Book:

Web Technologies: TCP/IP to Internet Application Architectures-TATA McGraw Hill Publications – Achyut S Godbole, Atul Kahate

MCA-19206 Object Oriented Programming through JAVA Lab

Instruction: 3 Periods/week	Time: 3 Hours	Credits: 2
Internal: 50 Marks	External: 50 Marks	Total:100 Marks

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1. a) Write A Java Program to print Quadratic roots using command line arguments.

   b) Write a java program to print multiplication table using arrays.

2. Write a java program to find the volume of a Box using method overloading with different number of parameters.

3. Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button is clicked.

4. Write a Java program that creates a user interface to perform integer divisions. If Num1 or Num2 is not an integer, the program would throw a Number Format Exception. If Num2 is Zero, program would throw an Arithmetic Exception. Display the exception in a message dialog box.

5. Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.

6. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with “Stop” or “Ready” or “Go” should appear above the buttons in selected color. Initially, there is no message shown.

7. Write a Java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle, and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.

8. Write a java package for book class and then import and display the result.

9. Write a Java program to illustrate the multiple inheritance by using Interfaces.

10. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).

TEXT BOOKS

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education Pvt. Ltd.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

MCA-19207 WEB TECHNOLOGIES LAB

Instruction: 3 Periods/week	Time: 3 Hours	Credits: 2
Internal: 50 Marks	External: 50 Marks	Total: 100 Marks

List of Experiments:

1. Create web pages for an application demonstrating the working of different features of HTML and DHTML.
2. Demonstrate the use of CSS in organizing the layout of webpages

Implement at least two Java Script programs to demonstrate the working of 3.

Conditional statements

4. Looping statements.
5. Arrays
6. Functions.
7. Event handling
8. Validation controls.

Develop simple applications for the following

9. Exercise client server programming using Java Script, Servlets, ASP, JSP
10. Create a web application with database connectivity and work on different queries for data manipulation.

REFERENCES:

1. Web Technologies, Godbole, Kahate, 2nd Ed., TMH
2. Internet & World Wide Web How to program, Dietel & Deitel Fourth Edition, PHI
3. Web Programming, building internet applications, 2nd Ed., Chris Bates, Wiley Dreamtech
4. The complete Reference HTML and DHTML, Thomas A. Powey
5. Core Servlets and Java Server Pages, Marty Hall Larry Brown, Second Edition