

DEPARTMENT OF COMPUTER SCIENCE (PG)

Master of Computer Applications Curriculum 2015 - 18 Batch

http://www.kristujayanti.edu.in

Course Matrix

Semester	Paper Code	Title of the Paper	Hours	Credits	CIA	ESE	Total
Ι	MCA151201	Assembly Language Programming using 8086	4	3	30	70	100
	MCA151202	Concepts of Computing and Problem Solving	4	3	30	70	100
	MCA151203	Mathematical Foundation of Computer Science	4	3	30	70	100
	MCA151204	Operating Systems	4	3	30	70	100
	MCA151205	Soft Skills	4	3	30	70	100
	MCA1512L1	Assembly Language Programming Lab	4	3	30	70	100
	MCA1512L2	Programming in C Lab	4	3	30	70	100
		Total	28	21	210	490	700

Semester	Paper Code	Title of the Paper	Hours	Credits	CIA	ES E	Total
	MCA152201	Data Structures	4	3	30	70	100
	MCA152202	Object Oriented Programming with Java	4	3	30	70	100
	MCA152203	Computer Networks	4	3	30	70	100
п	MCA152204	Linux System Programming	4	3	30	70	100
11	MCA152205	Relational Database Management System	4	3	30	70	100
	MCA1522L1	Data Structures Lab	4	3	30	70	100
	MCA1522L2	Java Programming Lab	4	3	30	70	100
	Total		28	21	210	490	700

Semester	Paper Code	Title of the Paper	Hours	Credits	CIA	ESE	Total
	MCA153201	Web Technologies	4	3	30	70	100
	MCA153202	Probability and Statistics	4	3	30	70	100
ш	MCA153203	Design and Analysis of Algorithms	4	3	30	70	100
	MCA153204	Software Engineering	4	3	30	70	100
	MCA153#01	CBCS – Open Elective	4	3	30	70	100
	MCA1532L1	Web Programming Lab	4	3	30	70	100
	MCA1532P1	Software Engineering Mini Project	4	3	30	70	100
		Total	28	21	210	490	700

Semester	Paper Code	Title of the Paper	Hours	Credits	CIA	ESE	Total
	MCA154201	Middleware Technologies	4	3	30	70	100
	MCA154202	Accounting for IT Professionals	4	3	30	70	100
	MCA154203	Data and Knowledge Mining	4	3	30	70	100
TX7	MCA154#01	Elective Paper I	4	3	30	70	100
IV	MCA154#01	Elective Paper II	4	3	30	70	100
	MCA1542L1	Network Programming Lab	4	3	30	70	100
	MCA1542P1	Enterprise Computing Project	4	3	30	70	100
	Total		28	21	210	490	700

Semester	Paper Code	Title of the Paper	Hours	Credits	CIA	ESE	Total
	MCA155201	System Software	4	3	30	70	100
	MCA155202	Information Security	4	3	30	70	100
	MCA155203	Object Oriented Analysis and Design using UML	4	3	30	70	100
N7	MCA155#01	Elective Paper III	4	3	30	70	100
v	MCA155#01	Elective Paper IV	4	3	30	70	100
	MCA1552P1	Software Project Management Lab	4	3	30	70	100
	MCA155#P1	Project on Elective Paper III	4	3	30	70	100
		Total	28	21	210	490	700

Semester	Paper Code	Title of the Paper	Hours	Credits	CIA	ESE	Total
VI	MCA1562P1	Major Project	-	20	50	150	200

CBCS Paper (III SEM)

S.No	Title of the Paper	Department
1	Fundamentals of Finance	
2	Stock market Management	Management Studies
3	Event Management	
4	Finance and Banking	
5	Investment Management	Commerce
6	Introduction to Digital Photography	
7	Basics of Technical Writing	Humanities
8	Personality Development	Psychology
9	Basic Counseling Skills	
10	Disaster Management	
11	Corporate Social Responsibility	Social Work
12	Introduction to Human Rights	

Elective Paper I (IV SEM)

Paper Code	Title of the Paper
MCA154A01	Theory of Computation
MCA154B01	Artificial Intelligence and Expert Systems
MCA154C01	XML and Web Services
MCA154D01	Managerial Skills for IT Professionals

Elective Paper II (IV SEM)

Paper Code	Title of the Paper
MCA154S01	Cloud Computing
MCA154T01	Software Testing and Quality Management
MCA154U01	Multimedia Communications
MCA154V01	Mobile Computing

Elective Paper III (V SEM)

Paper Code	Title of the Paper
MCA155A01	Embedded Systems
MCA155B01	Compiler Design
MCA155C01	Simulation and Modeling
MCA155D01	E-Commerce and M- Commerce

Elective Paper IV (V SEM)

Paper Code	Title of the Paper
MCA155801	Data Analytics
MCA155T01	Software Testing Tools
MCA155U01	Digital Image Processing
MCA155V01	Database Administration

List of VACs

Semester	VAC	Hours	Credits
Ι	Web Designing Lab	3	2
II	VB .Net and C#	3	2
III	ASP.NET	3	2
IV	J2EE	3	2
V	Recent Technology – Open Source	3	2
	Total	15	10

Extra Credits

Semester	Subject	Credits
	Technical Community Presentations	
	Department Activities Involvement(Intra and Inter Collegiate fest)	
I to V	Fest(Other college – Inter collegiate fest)	5
	Social Outreach Programme	
	Aptitude Enhancement Training	

Out of 140 credits 5 credits are exclusively assigned for the active participation of students in cocurricular and extracurricular activities that would enhance their leadership skills, communication and team- work. Every semester the activities like Student Seminars (in- house), Social Outreach Programmes, Paper Presentation (external), Aptitude Enhancement Programmes, Technical Community Presentations, participation in workshops/ seminars (external), are conducted.

Active participation in any one of above will fetch a credit in each semester.

CIA – Continuous Internal Assessment ESE- End Semester Examination

Total Credits:

5(Semester) x 23^{*} + 20 (Final Project) + Extra Credit 5(Semester) × 1= 140Credits *Each Semester (Course Credits 21 + VAC Credits 2)

The	eory	
	Component	Marks
	CIA I - One Mid Term Examination	15
	CIA II - One Assignment	5
	CIA III - One Seminar	5
	CIA IV - Paper presentation / Case Study / Mini Project	5
	Total	30

CIA for practical's/project 2015-2018(30 marks)

Component	Marks
CIA I - One Mid Term Examination	20
CIA II - Class work/review	5
CIA III - Record/project report	5
Total	30

Suggested Question Paper Pattern

ESE total marks - 70

Question paper pattern (total marks 70) Part A - 5*4 out of 8 - 20 Part B - 5*10 out of 8 - 50(maximum subdivisions allowed 2)

MCA151201 ASSEMBLY LANGUAGE PROGRAMMING USING 8086

Credits: 3

Objectives:

- To understand the basics of a processor based design by referring to the architectural details, instruction set and machine level programming.
- It helps the learner to optimize the resource (hardware) utilization, while designing any applications using high level programs or operating systems.

Unit1: Number Systems and Logic Gates

Counting in Decimal and Binary; Place Value; Binary to Decimal Conversion; Decimal to Binary Conversion; Hexadecimal Numbers; Octal Numbers; Bits; Bytes; Nibbles; and Word Size; Binary Subtraction; Addition and Subtraction; r complement; (r-1) complement; Functional Units; Basic Operational Concepts; Bus structures; Performance; Memory Location and Addresses; Memory Operations

Unit2: 8086 Architecture and an Introduction

8086 Architecture and Introduction to 16 Bit Processing - 8086 Architecture and programming model; registers; flags; memory segmentation; pin description; odd & even bank of memory; interfacing of memory RAM and EPROM.

Unit 3: 8086 Instruction Template and Addressing Modes

8086 Instruction Template and Addressing Modes - Instruction template for 8086 instructions, code generation using template, Immediate addressing, register addressing, memory addressing, indexed addressing with displacement, I/O port addressing.

Unit 4: 8086 Instructions: Data Transfer Instruction

8086 Instructions- Data Transfer Instruction: Move data to register/memory from register / memory / immediate data; data transfer between a segment register and register/memory; PUSH and POP; exchange; data transfer with I/O ports. Data Conversion instructions- XLAT, LEA, LDS, LES, LAHF and SAHF instructions. Arithmetic Instructions - Add; subtract; negate; compare; CBW; CWD; multiply and divide instructions. Logical Instructions- AND; OR; EX-OR; Test; NOT; ROTATE and shift instructions. Process Control Instructions -Instructions to set/reset flags; halt; wait; lock; prefix and escape to co-processor instructions. String Instructions - CMPS; MOVS; LODS; STOS; and SCAS instructions. Branch Instructions: JMP; conditional jump; LOOP; LOOPE; LOOPNE; JCXZ; CALL; RET.

Unit 5: Interrupts of 8086

Interrupts of 8086: Hardware interrupt; software interrupt and exception; priority of interrupts Assembly language programming: Assembly language programming examples; subroutines and macros; examples.

References:

Daniel Tabak, Advanced Microprocessors, (2nded.). Tata McGraw Hill Publications. Douglas, V Hall. Microprocessors and Interfacing (2nd Ed.). Tata McGraw Hill Publications. Dr.Udayakumar, K and Uma Shankar, B. S. Advanced Microprocessors and IBM -PC Assembly Language Programming: Tata McGraw Hill Publications.

Morris Mano, M (2008). Digital Logic and Computer Design, (10th ed.). Pearson.

RayBhurchandi, Advanced Microprocessors and Peripherals, Architecture, Programming and Interfacing. Tata McGraw Hill Publications.

Tokenism (2004). Digital Electronics Principles and Applications, (6thed.). McGraw Hill.

Total: 60 Hours

12hrs

12hrs

12hrs

12hrs

MCA151202 CONCEPTS OF COMPUTING AND PROBLEM SOLVING

Credits: 3

Objectives:

To gain experience in the C programming language, to compile and execute a C program in a programming environment and to debug C programs.

Unit1: Introduction

Basics of Programming- Algorithm; flowchart and pseudo code.

Introduction to C-Development of C; Features; Constants and Variables; Data types; Operators and Expressions; Library functions.

I/O Statements- Formatted and unformatted I/O operations;scanf(),printf(),getchar() and putchar() functions.

Unit 2: Decision Making and Arrays

Branching and Looping- Conditional and unconditional; if, for, while and do....while, switch; breakand continue, go to statement.

Arrays- One and multi-dimensional arrays; searching algorithms (linear and binary search); sorting algorithms; Predefined streams.

Unit 3: Functions and String Handling

Functions – Definition; different types; advantages; calling a function; passing Parameters call by reference and call by value; local and global variables; function with arrays; recursive functions; The scope of variables in functions; different storage classes

String Handling - String functions; Arithmetic operations on characters;sscanf();sprintf().

Unit 4: Pointers, Structures and Union, and Pre-processor

Pointers- Features of Pointers; Pointer Declaration; Arithmetic operations with Pointers; Pointers and Arrays; Pointers and Two dimensional Arrays; Array of Pointers; Pointers to Pointers; Pointers and strings; void pointers.Structures andUnions - Defining a structure;typedef definitions; array of structures; pointer and structures; passing structures to a function; passing structure pointers to a functions; unionPre-processors- Macro substitution; file inclusion directives; compiler; control directives.

Unit 5: Files and Advanced Concepts in C

Files- Introduction, streams and file types, file operations, input and output operations on files using fprint(), fscanf(), fgets(), fputs(), getc() and putc(), Unformatted files, fread() and fwrite(), command line arguments

Advanced Concepts in C: ROM-BIOS Functions, Invoking ROM-BIOS functions, CPU registers, Interrupts and Interrupt Vector Table, int86 () functions, intdos() functions.

References:

Ashok, N and Kamthane, (2012).*Programming in C*.(2nd ed.).Pearson Education Deitel, H.M. and Deitel, P.J. (2006). *C: How to Program.* (3rded.). New Delhi: Pearson Education. Schildt, Herbert, (2007).*C: The Complete Reference,* (4th ed.). TataMcgraw Hill Publishing Co Ltd, YashwantKanetkar, *Let us C.* (8th ed.). New Delhi: BPB Publications

12hrs

12hrs

12hrs

12hrs

12hrs

Total: 60 Hours

MCA151203 MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

Credits: 3

Objectives:

• To acquire basic knowledge on various mathematics concepts related to computer programming, network analysis and graphics programming using matrix operations, graph theory, set theory and propositional calculus.

Unit1: Logic, Functions and Relations

Logic; Propositional equivalences; predicates and quantifiers; nested quantifiers; methods of proof; mathematical induction; sets; set operations and functions; integers and division; integers and algorithms; application of number theory; matrices.

Relation: n-array relations and applications; representing relations; closures of relations; equivalence relations; partial orderings.

Unit 2: Combinatorics

Counting: basics of counting; pigeonhole principle; permutation and combination; binomial coefficient; generalized permutations and combinations.

Unit 3: Graph Theory

Introduction; representing graphs and graph isomorphism; connectivity; Euler and Hamilton paths; shortest path problems; planar graphs; graph coloring; spanning trees; minimum spanning trees.

Unit 4: Groups, Rings, Fields and Algebras

Introduction to group theory; subgroups; cyclic groups; cosets and Lagrange's theorem; codes and group codes; homomorphism of groups; normal subgroups; rings; integral domain and field(definition and basic properties only,statement of theorems but not proofs); Boolean algebras: Lattices and algebraic systems; basic properties of lattices; types of lattices; Boolean function and Boolean expressions.

References:

Akerkar, Rajendraand Akerkar, Rupali. Discrete mathematics. Pearson Education
Biggs, Norman L. Discrete mathematics. Oxford University Press.
Kolman, Bushy, Ross. Discrete mathematical structures. Pearson Education.
Liu, C.L. (2002). Elements of discrete mathematics. TMH (2nd ed.) ISBN 0-07-043476X
(Unit 4, chapter 11 and 12)
Rosen, Kenneth H.(2003). Discrete mathematics and its applications. TMH,(5th ed.). ISBN 0-07
242434-6 (Unit 1-3)
Scheinerman, Edward R. (2001). Mathematics - a discrete introduction. 5th reprint, ISBN 984240-0923, Thompson learning.
Tremblay and Manohar R. Discrete mathematical structures with its applications to computer science.
Tata Mcgraw Hill, ISBN 00/065142-6

Total: 60 Hours

15hrs

15hrs

15hrs

MCA151204 OPERATING SYSTEMS

Credits: 3

Objectives:

To gain extensive knowledge on the concepts and the principles of the Operating System in a contemporary programming environment

Unit1: Introduction to Operating Systems

What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Operating System operations; Operating System Services; User - Operating System interface; System calls; Types of system calls; System programs; Operating System design and implementation; Virtual machines; Operating System generation; System boot.

Unit2: Process Management and Synchronization

Process concept; Process scheduling; Operations on processes; Inter-process communication, Multi-Threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling criteria; Scheduling algorithms; Multiple-Processor scheduling; thread scheduling. Synchronization: The Critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors. Deadlock prevention and avoidance mechanisms.

Unit 3: Memory Management

Memory Management Strategies: Background; Swapping; Contiguous memory allocation; Paging; Structure of page table; Segmentation. Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing.

Unit 4: File System, Implementation of File System

File System: File concept; Access methods; Directory structure; File system mounting; file sharing; Protection. Implementing File System: File system structure; File system implementation; Directory implementation; Allocation methods; Free space management.

Unit 5: Secondary Storage Structures and Linux Case Study

Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management; Swap Linux history; Design principles; Kernel modules; Process management; space management. Scheduling; Memory management; File systems, Input and output; Inter-process communication.

References:

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, (2012). Operating System Principles, (9th ed.). retrieved from http://www.os-book.com/

D.M Dhamdhere, (2002): Operating systems - A concept based Approach. (2nd ed.).Tata McGraw-Hill Publications.

Harvey M Deital, (2005): *Operating systems*. (3rd ed.). Pearson Education.

Stallings, William, (2001). Operating Systems, (2nded..). Pearson Education Asia.

Tanenbaum, Andrew.S, (2004). Operating System Design and Implementation. Pearson Education.

Total: 60 Hours

12hrs

12hrs

12hrs

12hrs

MCA151205 SOFT SKILLS

Credits: 3

Objectives:

Soft skills are the quintessential element for the growth of an individual. To equip the students with effective communication and interpersonal skills which play a vital role to progressing up the ladder in an organization.

Unit 1:

Introduction to Soft Skills, Introduction to Hard Skills, Difference between Soft & Hard Skills, Break the ice berg -FEAR, You are the Chief Architect of yourself. The Self Concept: Attitude, The process of Attitude formation, Positive Attitude, Self-Management Techniques. Believe in yourself: Self Image and Self Esteem, Building Self Confidence.

Unit 2:

Meaning and definition of Personality, Personal Planning and Success Attitude: Prioritizing, Creating the Master Plan, Active positive visualization and SWOT Analysis. Self-Motivation, Levels of Motivation, Power of irresistible enthusiasm.

Unit 1:

Career Planning, Goal Setting, Resume Building, Different Types of Test, Group Discussion and Group Activity, Interview Techniques, Effective Presentation Strategies and aids, Psychometric Test, Time Management, Stress Management, Body Language.

Unit 1:

Written communication that includes project proposals, brochures, newsletters, articles. Etiquettes that include: etiquettes in group, social and office settings, email etiquettes, telephone etiquettes. Improving Personal Memory, Study skills that include rapid reading, notes taking and creativity. Verbal Communication includes Planning, Preparation Delivery, Feedback and assessment of activities like: Public speaking, Listening and observation skills.

Unit 1:

Problem Solving and Decision Making Skills, Critical & Creative thinking, Leadership as a process: coordination while working in a team, Leadership styles, Leader and Team player, Management of conflict, Profiles of great and successful personalities

References:

David E. Rye, 1,001 ways to inspire your organization, your team and yourself, Jaico publishing house. John Hoover & Angelo Valenti, Unleashing Leadership-Jaico publishing House -

WWW.JAICOBOOKS.COM

Kundu, C.I, Personality development, Sterling Bangalore. Listening and Responding - Sandra D.Collins-Cengage Learning India.

Richard Denny (3rd edition)Succeed for your self- Kogan page India www.vivagroupindia.com.

Wallace, (2008), Personality Development 1st Edition, Cengage Learning India.

Total: 60 Hours

12hrs

12hrs

12hrs

12hrs

MCA1512L1 ASSEMBLY LANGUAGE PROGRAMMING LAB

(All programs to be written using 8086 assembly language)

- 1. Familiarization of basic input output monitor modules (not to be evaluated in exams)
 - i. Reading data from keyboard

ii. Displaying data on LCD panel

2. Design functionality pertaining to various arithmetic operations

- i. Perform binary arithmetic operations on 16 bit, 32 bit and 8 bit numbers
- ii. Perform BCD arithmetic operations on 16 bit and 8 bit numbers

3. Managing variable data width

- i. Perform binary arithmetic operations on 32 bit and 8 bit numbers
- ii. Perform BCD arithmetic operations on 8 bit numbers

4. Usage of Memory pointer

- i. Average of N- 8-bit/16-bit binary and decimal numbers.
- ii. To generate the Fibonacci series up to the given limit
- iii. To find Minimum and maximum out of N numbers

iv. To sort given N numbers in ascending/descending order

5. Module and subroutine usages

- i. To Find the GCD of 2 integer numbers (both binary and decimal)
- ii. To calculate factorial of a given number using recursion technique.
- iii. To generate and print prime numbers up to a limit N (both binary and decimal).

6. Processing of data from arrays

- i. To find the Sum and difference of two matrices of order MxN and PxQ
- ii. Reverse of an array of numbers

Note: The programs provided are to be referred only as sample program objectives. Any other programs to evaluate the concept awareness can also be considered for examination.

MCA1512L2 PROGRAMMING IN C LAB

Write C programs to implement the following

- 1. Conditional operator
- 2. Bitwise operators
- 3. Type casting
- 4. Looping constructs
- 5. Decision making
- 6. String Handling
- 7. Sorting
- 8. Searching
- 9. Arrays
- 10. Functions
- 11. Recursion
- 12. Pointers
- 13. Preprocessor Directives
- 14. Structure
- 15. Interrupts
- 16. Dynamic Memory allocation
- 17. Files

MCA152201 DATA STRUCTURES

Credits: 3

Objectives:

To learn the concepts and applications of data structures and enable them to solve problems using various data structures.

Unit 1: Algorithm Analysis and Introduction

Pseudo code; The Abstract Data Type; A Model for an Abstract Data Type; Algorithm analysis with Big Oh notation; Data Structure – Definition, Classifications, Operations;

Searching - Linear Search and Binary Search Algorithms; Hashed List Searches; Collision Resolution.

Unit 2: Linear Lists

Linear List Concepts; Linked List; Linked List Algorithms; Building a Linked List; implementation; Linked List Abstract Data Type; Processing a Linked List; Linear List Applications; Complex Linked List Structures; Circular and Doubly Linked List; Applications; Josephus Problem.

Unit 3: Stack and Queue

Stack: Basic Stack Operations; Linked List implementation; Stack Applications; Conversion of Infix to Postfix; Evaluation of Postfix; Decimal to Binary conversion; Recursive function implementation of factorial; ADT Linked List Implementation; Array Implementation of Stack;

Queue: Operations; Classifications; Linked List Implementation; ADT Linked List Implementation; Applications; Categorizing Data, Queue Simulations; Array Implementation of Queue.

Unit 4: Trees and Graphs

Binary Tree: Concepts; Traversals; Binary Search Trees; AVL Trees; Multiway Trees: B-Tree, Simplified B-Tree; B – Tree variations; Terminology; Operations;

Graph: Storage Structures; Traversal Algorithms; Shortest Path Algorithm; Abstract Data Type.

Unit 5: Sorting

General Sort concepts: Insertion Sorts; Selection Sorts; Exchange Sorts.

References:

Horowitz, Ellis and Sahul, Sartaj, (1983). Fundamentals of Data Structures, (1st ed.). Galgotia publication Pvt Ltd

Jean-Paul Tremblay & Paul G Sorenson. An Introduction to Data Structures with Applications, Tata McGraw-Hill Publishers

Kamthane, Ashok N. (2007).*Introduction to Data Structures in C.* Pearson Education Delhi Mark Allen Weiss, (1999).*Data Structures and Algorithm Analysis in C.* Addison-Wesley Nell Dale, C++ Plus Data Structures, Jones & Bartlett Publishers

Richard F.Gilberg, Behrouz A. Forouzan, (2002). *Data Structures: A Pseudo code Approach with C*. Thomson Asia Pvt., Ltd.

Robert L. Kruse, Bruce P. Leung, Clovis L. Tondo, (2001). *Data Structures and Program Design in C.* Prentice Hall India.

Seymour Lipschutz, *Data Structures with C*. (Special Indian Edition). Tata McGraw Hill Education Pvt. Ltd. Schaum's Outlines

12hrs

12hrs

12hrs

12hrs

12hrs

Total: 60 Hours

MCA152202 OBJECT ORIENTED PROGRAMMING WITH JAVA

Credits: 3

Objectives:

To understand the concept of basic syntax of java, writing simple objects in Java, Concept of inheritance, interface and packages, threading and exception handling mechanism.

Unit 1: Introduction

Evolution of programming methodologies, procedural Approach vs Object-Oriented Approach. Principles of OOP- Encapsulation, Inheritance and Polymorphism. Concepts of OOP: Abstraction, Overloading, Reusability, Extensibility, Dynamic Binding, Message Passing.

Java Features; comparison of Java with C and C++; Java and Internet; Java Environment; Java Program structure; Java Tokens; Implementing a Java Program Java Virtual Machine; Constants, Variables; Data Types; Scope of Variables; Type casting; Operators and expressions; Decision Making; Branching and Looping.

Unit 2: Classes and Arrays

Defining a class; Constructors; Methods; overloading; static Members; Nesting of Methods; Overriding methods; Final Classes; Abstract Class; Visibility control Arrays; creating an array; Two Dimensional arrays; Strings; String Arrays; String Methods; String Buffer Class; Vectors; Wrapper Classes.

Unit 3: Inheritance Interfaces and Packages

Defining a subclass; Subclass constructor; multilevel inheritance; Hierarchical Inheritance; Defining Interfaces; Extending Interfaces; Implementing Interfaces; Java API Packages; creating a package; Accessing and using a package; adds a class to a package; Hiding Classes.

Unit 4: Multithreading Exception Handling and Files creating Threads

Extending the Thread class; Thread Life cycle; Thread Exception, Thread priority, Synchronization; Runnable Interface; Exceptions, Throwing own Exceptions; Concepts of streams; stream classes; Byte Stream Classes; Character stream Classes; Using Streams; Using file Class; Other Stream Classes.

Unit 5: Applet Programming, JDBC

Difference between Application and Applets; Applet Life cycle; creating an Executable Applet; Designing a Web Page; Adding Applet to HTML File; Passing Parameters to Applets; Event handling mechanism. Java Database Connectivity: introduction; Establishing Connection, Creation of Data Tables; Table Updating, Result set.

References:

Bruce Eckel. *Thinking in Java*, Prentice Hall
C Muthu. (2004). *Programming with Java*. Thomson Learning.
E. Balagurusamy. (2002). *Programming with Java – A primer* (2nd ed.).
Delhi: Tata McGraw Hill Publishing Company
Deitel and Deitel, *Java How to Program*. (3rded,). Pearson Education Asia.
Gary Cornell, Cay Horstmann, *Core Java 1.2*. Prentice Hall Computer Books
Herbert Schildt. (2002). *The complete Reference – Java 2*. (5th ed.). TataMcGrawHill
Publishing Company, Delhi.
RashmiKanta Das. (2011). *Core Java for Beginners*. (Revised Edition). Vikas

12hrs

Total: 60 Hours

12hrs

12hrs

12hrs

MCA152203 COMPUTER NETWORKS

Credits: 3 **Objectives:**

To become familiar with layered communication architectures (OSI and TCP/IP), to understand the concepts of reliable data transfer, to know the principles of routing algorithms and congestion control and trade-offs in fairness and efficiency, to understand the concepts of protocols in different layers of network

Unit 1: Introduction

Uses of Computer Networks, Network Hardware, Network Software, Reference Models, A comparison of OSI TCP/IP reference models.

Physical Layer: Guided transmission media, Wireless transmission, Communication satellites, the mobile telephone system.

Unit 2: Data Link Layer

Data link layer design issues, error detection and correction elementary data link protocols, sliding window protocols.

Medium access control; Ethernet, wireless LANs broad band wireless Bluetooth, repeaters, hubs, bridges, switches, routers and gateways.

Unit 3: Network Layer

Network Layer design issues, routing algorithms; shortest path routing, flooding, distance vector routing, link state routing, routing for mobile hosts, routing in Ad Hoc networks, congestion control algorithms. Quality of service, Network layer in the internet. Internet working.

Unit 4: Transport layer

The Transport layer service, elements of transport protocols, the internet transport protocols: UDP, the internet transport protocols: TCP, Application Layer;

Unit 5: Application Layer

Traditional Applications; Electronic mail- SMTP, MIME, iMap, World Wide Web-HTTP, web services, Multimedia Applications; session control and call control, resource allocation for multimedia applications, Infrastructure services; DNS, SNMP.

References:

Andrew S.Tanenbaum, David J.Wetherall, (2012), Computer Networks, , Pearson, (5th ed). Larry L.Peterson, Bruce S.Davie, (2011), Computer Networks – A Systems Approach, Elsevier, (5th ed.) James F.Kurose and Keith W Ross, (2005), "Computer Networking: A top-down Approach featuring the Internet", (3rd ed.), Pearson Education.

Total: 60 Hours

12hrs

12hrs

12hrs

12hrs

MCA152204 LINUX SYSTEM PROGRAMMING

Credits: 3

Objectives:

To give a firm ground on Linux environment to program the real world application.

Unit 1: Introduction to Linux Operating System Environment

Linux evolution, Main characteristics of Linux OS; Linux Distributions; General Kernel responsibilities; Kernel overview; Linux versus other UNIX like Kernels; programming Linux; GNU C compiler; GNU make; GNU Debugger; Development system roadmap; Compiling the Kernel; Kernel related commands; System related commands.

Unit 2: Shell Programming and Advance System programming

Introduction to Shell; Shell as a programming language; Types of Shells; Shell syntax; Pipes and redirection; Environment variables; working with Files; Introduction to process; Process state transition; Creation of a new process; Termination of a process; Process scheduling; Waiting for the process; Zombie process; sharing data between processes using files; thread overview; POSIX threads; Thread implementation; Interprocess Communication; Signals; Socket Programming.

Unit 3: Kernel Module Programming

Creation of Static & Dynamic Libraries; Portability support in the kernel; Step by Step demystification of Linux Boot Procedure; Module Programming; The Hello World Module; Module Stacking; Module Parameters; System Calls; Registering a System Call;System Call Handler; Service Routines.

Unit 4: Kernel Synchronization

Critical Sections; Race Conditions; Concurrency and its Sources;Mechanisms for Kernel Synchronization;Semaphores;Reader Writer Semaphores;Spinlocks;Reader Writer Spinlocks;Completions;Sequential locks;Barriers;Read Copy Update;Atomic Operations;Memory Allocation in the kernel.

Unit 5: Interrupts and Device Drivers

Handling I/O;I/O Architecture;I/O Mapped I/O;Memory Mapped I/O;Interrupts & Interrupt Handlers; Device Numbers Major and Minor Numbers; Registering and Unregistering; Static and Dynamic allocations, Important Structures:File Operations,FileInode,Character Devices, cdev structure,Adding, Allocating, Initializing and Deleting,User Space Applications and Device Driver mapping,Access methods within the driver, open, read, write and close,Advanced Character Drivers,IOCTL,Wait Queues. Parallel Port Driver,Serial Port Driver,Block Drivers,USB Drivers,Network Drivers,PCI Drivers,TTY Subsystem

References:

Ashfaq A. Khan (2002).*Practical Linux Programming*. New Delhi India:Firewall Media.
Daniel P.Bovet& Marco Cesati, (2006).*Understanding Linux Kernel*(3rded.)O'reilly Series.
Greg Kroah-Hartman (2006).*Linux Kernelin a Nutshell*. O'reilly Series.
Jonathan Corbet, Alessandro Rubini& Greg Kroah-Hartman (2005).*Linux Device Drivers.*(3rded.) O'reilly Series (Unit V)
Michael Beck, Harald Bohme, Robert Magnus, Dirk Verwoner; (2002).*Linux Kernel Programming*(3rd ed.). Pearson Education Ltd.(Unit III)
Neil Mathew and Richard Stones (2004).*Beginning Linux Programming*(3rd ed.) Wiley
Publishing, Inc. (Unit II)
Robert Love, (2010).*Linux Kernel Development*(3rd ed.). Pearson Education Inc.
W. Richard Stevens (2002).*UNIX Network Programming*.(11th ed.). Prentice Hall of India private Itd.

12hrs

12hrs

12hrs

Total: 60 Hours

12hrs

MCA152205 RELATIONAL DATABASE MANAGEMENT SYSTEM

Credits: 3

Objectives:

To understand the database development process and technology, the Structured Query Languages (SQL), to design data models for database applications using the entity - relationship (ER) diagrams (conceptual design), to understand the database security, to understand the architecture of distributed database.

Unit 1: Introduction

Basic Concepts and definitions; traditional file processing systems; disadvantages of file procession systems; the database approach; advantages of database approach; DBMS; components of the database environment,; Schemas and instances; Three-schema architecture and data independence; users of the database system; DBA; functions of DBA, database applications; centralized and client-server architectures

Unit 2: Data Models

Classifications of data models, ER Model; Entities, attributes and relationships, different types of attributes, Drawing E-R diagrams. EER Diagrams - Super class and Subclass, Specialization and Generalization. Relational Data Model - Relation, Integrity constraints-domain, entity and referential integrity constraints, Relational algebra, select, project and join operations in relational algebra. Introduction to Object Oriented Data Model and Object Oriented Databases

Unit 3: Database Design

Functional Dependencies –Database Design Concepts; Good and Bad Database Design; Lossless – Join Decomposition; Dependency Preservation – Normalization using Functional Dependency; Multi-valued Dependency and Join-Value Dependency; Designing a database schema for an application

Unit 4: SQL

SQL Data Definition and Data Types; Specifying basic constraints in SQL; Basic queries in SQL; Complex SQL Queries; Nested and Correlated Queries; Insert; Delete and Update statements in SQL; Views in SQL; UPDATE and DELETE CASCADE commands, PL SQL – Triggers and Procedures - Simple Exercises

Unit 5: Data Administration and Security

Transaction Processing - Transaction and System concepts, Characterizing Schedules, Concurrency control techniques; Two Phase locking; Database Recovery Concepts; Recovery Techniques. Distributed databases -Introduction, Distributed database architecture; Types of database partitioning; advantages and disadvantages.

References:

Abraham Silberschatz, Henry F Korth and Sudarshan S, *Database System Concepts*, (5th ed.). McGraw Hill Publication.

Bipin C Desai, (2000). An Introduction to Database Systems. Galgotia Publications

Date C.J. (2000). Introduction to Database System. (7th ed.). Addison-Wesley Publications

Elmasri and Navathe. (2006). *Fundamentals of Database System*. (4th ed.). Addison Wesley, Pearson Education.

Jeffry A Hoffer, Ramesh V and HeikkiTopi. (2011). *Modern Database management System*, (10thed.). Pearson.

Patrik O' Neil and Elizabeth O' Neil, (2001). *Database Principles, Programming and performance*. (2nded.). Morgan Kaufmann Publishers.

Total: 60 Hours

12hrs

12hrs

12hrs

12hrs

Peter Rob and Carlos Coronel, (2007). *Database System Design, Implementation and Management*. (7thed.). Thomson Course Technology.

MCA1522L1 DATA STRUCTURES LAB

Write C programs for the following: Section - A

- 1. Write a menu driven program to implement linear and binary search to find the location of first occurrence of an item.
- 2. Write a program to sort the array in ascending/descending order using
 - Quick sort
 - Merge sort
- 3. Write a menu driven recursive program to
 - i. Find factorial of a given number
 - ii. generate first N terms of a Fibonacci sequence
 - iii. GCD of three numbers
- 4. Write a program to solve the problem of Towers of Hanoi with 3 pegs and N discs.
- 5. Write a menu driven program to
 - a) Find the length of a string
 - b) Concatenate two strings
 - c) To extract a substring from a given string
 - d) Finding and replacing a string by another string in a text(Use pointers and user-defined Functions)
- 6. Write a program to convert the given infix expression into its postfix form.
- 7. Write a program to evaluate the postfix expression with a set of values.
- 8. Write a program to sort N elements in ascending order using heap sort technique.
- 9. Write a program to obtain the path matrix of the given graph.

Section – B

- 1. Write a menu driven program to create a linked list and to perform insert and delete operations.
- 2. Write a program to add two polynomials using a linked list.
- 3. Write a menu driven program to perform insert and delete operations in a circular linked list.
- 4. Write a menu driven program to perform operations on a stack(linked list implementation)
- 5. Write a program which demonstrates Round Robin process scheduling technique for n processes. The CPU burst time and time slice allotted for each process by CPU has to be taken as input. The program should give as output the response time for each process.
- 6. Write a menu driven program to perform operations on a circular queue (linked list implementation)
- 7. Write a menu driven program to perform insert, delete and traversal operations in a doubly linked list.
- 8. Write a menu driven program to create a binary tree and to perform insert and delete operations.
- 9. Write a menu driven program to create a binary search tree and to perform in order, preorder and post order traversals.

MCA1522L2 JAVA PROGRAMMING LAB

- 1. Write a program to convert a given Decimal number to Binary, Octal and Hexadecimal using recursive functions.
- 2. Write a program to explain the concept of constructor overloading.
- 3. Explain the concept of passing objects as parameters by adding two distances given in feet and inches.
- 4. Write a program to implement inheritance Concept in Java
- 5. Write a program to explain the concept of runtime polymorphism in java.
- 6. Write a program to implement producer consumer problem using thread concept.
- 7. Write a program to create object for Tree Set and Stack and use all methods.
- 8. Write a program to implement Exception handling in Java
- 9. Write a program to implement the Concept of Interface in Java
- 10. Write a program to get file name at runtime and display number of lines and words in that file.
- 11. Write a program to list files in the current working directory depending upon a given pattern.
- 12. Create a Frame for Student Registration containing all the fields Name, Age, Contact, Father's Name, Annual Income and a submit button. Perform field validations.
- 13. Write a applet program to create a calculator
- 14. Write a program to perform the following operation using JDBC
 - Insert, Update, Delete and

MCA153201 WEB TECHNOLOGIES

Credits: 3

Objectives:

To inculcate basic knowledge on Internet concepts, client and server-side programming and to employ it in creating dynamic and interactive web pages. This subject deals with basics of Internet, concepts of DHTML, Java Scripting and Server Side programming

Unit1: Basics of Internet

The Internet; WWW; Domain Names and Addresses; Web Hosting; DNS; Web publishing; Web Browsers & Web Servers; Web Pages; Web sites; Concept of Search Engines; Search engines types; searching the Web and Web Servers; URL; MIME; HTTP; Electronic mail; ftp; telnet; finger.

Unit2: HTML5

Introduction to HTML5, The browser wars, features of HTML5, Structural Elements, New Form/Input Elements, New Attributes, Canvas, Simple shapes, shapes styles, complex shapes, Text and Shadows, canvas pitfalls, canvas & SVG, audio and video, web storage, web sockets, web workers, indexed DB, drag and drop, web notifications.

Unit3: Java Script and DOM

Java Script's role on the Web, Java Script and HTML – The <SCRIPT> tag; Variables, Arrays; Data Types and Operators; Control Structures – if, else if, switch, while loop, do... While loop, for loop, for... in loop, With, Continue; Functions; Java Script Objects; Windows and Frames; Window Object and its Methods; Document Object and its methods; Java Script Object Model; Java Script Events and Event Handling; Frames and frame formatting; Image Object.

Unit4: HTTP Server Programming

HTML forms and CGI; HTTP;Servlet Programming; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; deployment of simple servlets, web server (Java web server / Tomcat/ Web logic) The Servlet API; The Javax.servlet Package; Reading Servlet Parameter; The Javax.servlet.http package; Handling HTTP Requests and Responses, HTTP GET and POST methods, Using Cookies; Session Tracking

Unit5: JSP and XML

Java Server Pages (JSP); JSP, **JSP** life cycle, Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects; XML – Tags, Elements, Attributes, XML with CSS, XML and DTD (Document Type Definition), XML Schema.

References:

Achyut S. Godbole (2004). Web Technologies. Tata McGraw Hill.
David Flanagan (1997). JavaScript the Definitive Guide. O'Reilly & Associates
Don Gosselin. Comprehensive Java Script, Web Warrior Series. Course Technologies Inc.
Herbert Schildt. The Complete Reference Java. (7th ed.). New Delhi: Tata McGraw-Hill Publishing
Company Limited.
H.M. Deitel, P.J. Deitel, and T.R. Nieto, (2000). Internet and World Wide Web, How to Program.
Cambridge Prentice Hall.
Ivan Bayross (2012). HTML5 and CSS3 Made Simple, BPB publisher.
Jim Koegh (2004). The J2EE: Complete Reference. Tata McGraw Hill.
J. Niederst, (1999). Web Design in a Nutshell. O'Reilly – Associates.

MadhushreeGanguli (2002). JSP – A Beginner's Guide. Wiley Dreamtech India (P) Ltd.

Marty Hall, (2003). The Core Web Programming. Prentice-Hall.

Total: 60 Hours

12hrs

12hrs

12hrs

12hrs

MCA153202 PROBABILITY AND STATISTICS

Credits: 3

Objectives:

This course is designed to equip the students with a working knowledge of univariate and bivariate descriptive statistics, concepts of probability, formulation and testing of hypothesis and Calculation of the Descriptive and Inferential Statistics by MS Excel

Unit 1: Introduction to Statistics & Describing Univariate Data

Introduction to statistics – meaning, function of statistics, concept of data, variable, measurement; Summarizing data – need & ways of summarizing data; Measures of central tendency – Averages –types, meaning, computation & uses; Measures of dispersion in data – Need, types, meaning, Measures of symmetry – concept of skewness and kurtosis, meaning & measures

Unit 2: Bivariate data analysis:

Correlation & Regression and Curve Fitting: Correlation – Need meaning, types and measures; rank correlation, lag and lead in correlations. Regression – meaning, fitting linear regression model – prediction & explanation with linear regression model, Statistical inference in regression model – test for significance of correlation coefficient, regression coefficient. Fitting of linear quadratic, exponential curves to a given set of data by principle of least squares

Unit 3: Probability Theory and Random variables

Probability – meaning and importance, theorems on probability, conditional probability, problems on application of probability, Bayes' theorem and its applications. Random variable – concept, properties – concept of probability mass, density and distribution function. Bi-variate distributions, marginal, conditional distributions for discrete variables, covariance and correlation coefficient, Independence of random variables. Addition and multiplication theorems of expectation, Central limit theorem

Unit 4: Probability distributions

Standard probability distribution–Binomial, Poisson, Geometric, Exponential, Normal probability distribution – properties & applications. Sampling distributions and standard error Sampling distribution of the sample mean. Definition of Chi – square, t and F distributions; Data collection – primary & secondary data –overview of data collection instruments; Sampling – need, benefits types; Sampling methods – probability and non-probability sampling methods – SRS, Stratified, Cluster, Systematic sampling methods.

Unit 5: Statistical Inference – Estimation & Hypothesis testing

Estimation of parameters – point & interval estimators for mean and proportion; Statistical Hypothesis Testing – meaning, formulation, errors in testing, level of significance and power of a test; Single population tests for mean, proportion & variance; Two population tests for mean, proportion & variance; Analysis of Variance (ANOVA) & Chi-Square test for goodness of fit and independence of attributes.

References:

Aggarwal B L, (2007) *Basic Statistics*, 4th Edition, New Age Publications, New Delhi Bhardwaj RS, (2006), *Mathematics for Economics and Business*, 2nd Edition, Excel Books, New Delhi Gupta S C, (2011) *Fundamentals of Statistics*, 6th Edition, Himalaya Publishing House, Mumbai Hooda RP, (2005) *Statistics for Business and Economics*, 3rd Edition, McMillan, New Delhi Ken Black, (2013) Applied Business Statistics, 7th Edition, Wiley India Edition Sharma JK, (2010) *Business Statistics*, 2nd Edition, Pearson, New Delhi. Sheldon M Ross, (2010) *Introductory Statistics*, 3rd Edition, Elsevier Inc. USA

Total: 60 Hours

12 hrs

12 hrs

12 hrs

12 hrs

MCA153203 DESIGN AND ANALYSIS OF ALGORITHMS

Credits: 3

Objectives:

To introduce the basic concepts of algorithms, the mathematical aspects and analysis of algorithms, the sorting and searching algorithms, various algorithmic techniques and also the algorithm design methods

Unit 1: BASIC CONCEPTS OF ALGORITHMS

Introduction; Notion of Algorithm, Fundamentals of Algorithmic Solving; Important Problem types; Fundamentals of the Analysis Framework; Asymptotic Notations and Basic Efficiency Classes.

Unit 2: MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHM

Mathematical Analysis of Non-recursive Algorithm; Mathematical Analysis of Recursive Algorithm; Example: Fibonacci Numbers; Empirical Analysis of Algorithms; Algorithm Visualization.

Unit 3: ANALYSIS OF SORTING AND SEARCHING

Brute Force; Selection Sort and Bubble Sort; Sequential Search and Brute-force string matching; Divide and conquer; Merge sort; Quick Sort; Binary Search; Binary tree; Traversal and Related Properties; Strassen's Matrix Multiplication; Decrease and Conquer; Insertion Sort; Depth first Search and Breadth First Search.

Unit 4: ALGORITHMIC TECHNIQUES

Transform and conquer; Presorting; Horner's rule and Binary exponentiation; Dynamic Programming; Warshall's and Floyd's Algorithm; Optimal Binary Search trees; Knapsack Problem and memory functions; Greedy Techniques; Prim's Algorithm; Kruskal's Algorithm; Dijkstra's Algorithm; Huffman trees.

Unit 5: ALGORITHM DESIGN METHODS

Backtracking; n-Queen's Problem; Hamiltonian Circuit problem; Subset-Sum problem; Branch and bound; Assignment problem; Knapsack problem; Traveling salesman problem; Limitations of Algorithmic Power; Lower bound arguments; NP and NP complete problems.

References:

Aho A.V, J.E. Hopcroft and J.D.Ullman, (2003). The Design and Analysis of Computer Algorithms. Pearson Education Asia.

AnanyLevitin, (2003). Introduction to the Design and Analysis of Algorithm, Pearson Education Asia.

Cormen T.H. C.E. Leiserson, R.L. Rivest and C. Stein, (2001). Introduction to Algorithms. PHI Pvt. Ltd. Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, (1997). Computer Algorithms. Galgotia Publications.

Michael T.GoodRich, Roberto Tamassia, Algorithm Design, foundations, Analysis and internal examples. ISBN 978-81-265-0986-7

Sara Baase and Allen Van Gelder, (2003). Computer Algorithms - Introduction to Design and Analysis. Pearson Education Asia.

Thomas H.Lorman, Charles, Ronald, An Introduction to Algorithms. IEEE Pub. 978-81-272-5464-3.

12hrs

Total: 60 Hours

12hrs

12hrs

12hrs

MCA153204 SOFTWARE ENGINEERING

Credits: 3

Objectives:

- To provide an insight into the processes of software development.
- To understand and practice the various fields such as analysis, design, development, and testing.
- To apply metrics and testing techniques to evaluate the software.

Unit 1: INTRODUCTION

Software Engineering paradigms- Waterfall Life cycle model, Spiral Model, Prototype Model, Fourth Generation Techniques – Planning, Software Project Scheduling, Risk analysis and management; Requirements and Specification; Case Study for Project Plan and SRS.

Unit 2: SOFTWARE DESIGN

Abstraction, Modularity; Software Architecture; Cohesion; Coupling; Various Design Concepts and notations; Real time and Distributed System Design; Documentation; Dataflow Orienteddesign; Jackson System development; Designing for reuse; Programming standards; Case Study for Design of any Application Project.

Unit 3: SOFTWARE TESTING AND MAINTENANCE

Software Testing Fundamentals; Software testing strategies; Black Box Testing; White Box; Testing – System Testing, Object Orientation Testing, and State based Testing; Testing Tools – Test Case Management, Software Maintenance Organization- Maintenance Report; Types of Maintenance, Case Study for Testing Techniques, Software Quality Management.

Unit 4: SOFTWARE METRICS

Scope – Classification of metrics; Measuring Process and Product attributes; Direct and Indirectmeasures; Cost Estimation; Reliability; Software Quality Assurance; Standards; Case Study for COCOMO model.

Unit 5: SCM & WEB ENGINEERING

Need for SCM – Version Control; SCM process; Software Configuration Items; Taxonomy; CASE Repository; Features; Secure Coding; Deployment Activities, Web Engineering, Agile development, Rapid Application Development.

References:

Ali Behforroz, Frederick J.Hudson, (2012). *Software Engineering Fundamentals*, Oxford Indian Reprint. Jibitesh Mishra, Ashok Mohanty, (2012). *Software Engineering*, Pearson Education, First Edition.

Kassem A. Saleh, (2009). Software Engineering, First Edition, J.Ross Publishing.

PankajJalote, (2005). An Integrated approach to Software Engineering, Third Edition, Springer Verlag. Richard Fairley, (2008). Software Engineering Concepts, Tata McGraw Hill Edition.

Roger S. Pressman, (2010). Software Engineering: A Practitioner Approach, Seventh edition, McGrawHill. Roger S. Pressman, David Lowe, (2008). Web Engineering: A Practitioner's Approach, Special Indian edition, McGrawHill.

Sommerville, (2004). Software Engineering, Sixth Edition, Addison Wesley-Longman.

Total: 60 Hours

12hrs

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12hrs

12hrs

MCA1532L1 WEB PROGRAMMING LAB

- 1. Write a Servlet program Reading form data using get and post methods
- 2. Write a Servlet program for HTTP status
- 3. Write a Servlet program for Error Handling
- 4. Write a Java Servlet program to display Cookie ID
- 5. Write a program to invoke servlets from Applets
- 6. Write a JSP program to perform basic Arithmetic functions
- 7. Write a JSP program for handling cookies
- 8. Write a JSP program for sending Email
- 9. Write a JSP program implement expressions
- 10. Write a program in JSP display the student mark list. Assume that student information is available in database which has been stored in a database server.

MCA1532P1 SOFTWARE ENGINEERING MINI PROJECT

The students are supposed to develop a mini project for the above mentioned lab. The students can do the project in a group (team) consisting of not more than 2 students. The entire project to be submitted by each team should be done with some DBMS backend like Oracle and front end tools like VB.Net, ASP.Net, etc.

MCA154201 MIDDLEWARE TECHNOLOGIES

Credits: 3 Objectives:

To understand the concept of basic software architecture, working of components, concept of Threading model, CORBA technologies, COM and .NET technologies.

Unit 1: Introduction

Software architecture; components; objects; fundamental properties of component technology; modules; interfaces; callbacks; directory services; component architecture; components and middleware.

Unit 2: Java Component Technologies

Threads; Java Beans; events and connections; properties; introspection; JAR file; reflection; object serialization; Enterprise Java Beans; Distributed Object Models; RMI and RMI-IIOP.

Unit 3: CORBA Technologies

Java and CORBA; Interface Definition language; Object Request Broker; System Object Model; Portable Object Adapter; CORBA services; CORBA component model; Containers; Application server; model driven architecture.

Unit 4: COM and .Net Technologies

COM, Distributed COM; object reuse; interfaces and versioning; dispatch interfaces; connectable objects; OLE containers and servers; Active X controls; .NET components; assemblies; appdomains; contexts; reflection; remoting.

Unit 5: Component Frameworks and Development

Connectors; contexts; EJB containers; CLR contexts and channels; black box component framework; directory objects; cross-development environment; component-oriented programming; Component design and implementation tools; testing tools; assembly tools.

References:

Alan Gordon, *The COM and COM+ Programming Primer*. Object Innovations Andreas Vogel, Keith Duddy, (1998). *Java Programming with CORBA*. John Wiley & Sons Ash Rofail, Yasser Shohoud, (1999).*Mastering COM and COM+*. SybexInc Ed Roman, (2004). *Enterprise Java Beans*. (3rd ed.). Wiley. Jose Mojica, *COM+ Programming with Visual Basic*. O'Reilly MediaInc Sudha Sadasivam G (2013), Component-Based Technology, Wiley-India

12hrs

Total: 60 Hours

12hrs

12hrs

12hrs

MCA154202 ACCOUNTING FOR IT PROFESSIONALS

Credits: 3

Objectives:

To introduce and gain thorough knowledge about the concepts of accounting and financial management system.

Unit 1:

Financial Accounting: Meaning and definitions, objectives of Accounting, Functions of Accounting, Users of Accounting Information, Limitations of Accounting, Accounting Principles- Accounting concepts and conventions, Passing of Journal entries, Posting ledger and preparation of trial balance, Final Accounts-Trading, Profit and Loss accounts and Balance Sheet of sole proprietary concern (Without adjustments).

Unit 2:

Cost Accounting: Introduction, Meaning, Objectives, Distinction between financial accounting and cost accounting, Installation of a costing system, advantages and limitations of cost Accounting, Essentials of Good costing system, concepts of cost, Cost Centre and cost unit, Methods and Techniques of cost Accounting, Classification and elements of cost, cost sheet, Problems and Solutions.

Unit 3:

Management Accounting: Meaning, Objectives, Nature and scope of management accounting, Role of Management Accountant, Relationship between financial accounting, cost accounting and management accounting, Financial Statement Analysis, Types and tools of financial Statement Analysis, Fund Flow Statement (simple problems), Cash Flow Statement (Simple Problems), Ratio Analyis (theory only).

Unit 4:

Computerized Accounting; Meaning & advantages, limitations of computerized accounting, manual accounting verses computerized accounting, Source documents, Balancing Accounts, Trial Balance & Final A/Cs in computerized, Accounting, Modules of computerized Accounting Systems. Developing computerized accounting systems, control & Audit in computerized accounting.

References

Armolel, (2003). Financial Accounting. PHI (Paperback editor). Bassett P.H, (2003). Computerized Accounting, BPB. Charlotte EudyMcConn, (2004). Business Computer Systems: Design, Programming & Maintenance. (PHI). Horngren and Sundem(2004). Introduction to Financial Accounting. PHI. Jain and Narang, (2003). Principles of Accounting. Jain and Narang, (2004). Cost Accounting. Kellock. J, (2003). Elements of Accounting. Heinemann. Kulkarni P.V, (2003). Financial Management, Himalaya Publishing House. Levy and sarnat, (2004). Principles of Financial Management. Prentice-Hall International. Neeraj Sharma, (2004). Computerized Accounting & Business Systems. Kalyani Publishers. Pandey I.M, (2003). Financial Management. Vikas Publications. Rockely.L.E, (2003). *Finance for the Non-accountant*, (2nd ed.). Ramachandran, (2003). Financial Accounting for Managers. Tata McGraw Hill. Sharma, Gupta & Bhalla, (2004). Management Accounting. Var Home, James C, (2003). Financial Management & Policy. Prentice Inc.

15hrs

15hrs

15hrs

15hrs

Total: 60 Hours

MCA154203 DATA AND KNOWLEDGE MINING

Credits: 3

Objectives:

To study the concept of Data Warehousing, Architecture, Online Analytical Processing (OLAP), Data mining and machine learning algorithms and their applications in Business.

Unit 1:

Data Warehouse: Data Warehousing, Operational Database Systems vs. Data Warehouses, Data Warehouse Architecture Multidimensional Data Model, Schemas for Multidimensional Databases, OLAP Operations, Types of OLAP.

Data mining and Data Preprocessing; Introduction to KDD process, Knowledge Discovery from Databases, Need for Data Preprocessing, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

Unit 2:

Association and rule mining, Introductions - Data Mining Functionalities - Association Rule Mining, Mining Frequent Item sets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint-Based Association Mining.

Unit 3:

Classification and prediction, Classification vs. Prediction - Data preparation for Classification and Prediction - Classification by Decision Tree - Bayesian Classification - Rule Based Classification -Classification by Back Propagation - Support Vector Machines - Associative Classification

Unit 4:

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

Unit 5:

Introduction to Rapid Miner; Problem Solving using Rapid Miner; Exploring Rapid Miner tool, Case Study: Association rule mining; Clustering; Predicting; Classification.

References:

Berson, Alex & Smith, Stephen J.(2007), Data Warehousing, Data Mining, and OLAP, TMH Pub. Co. Ltd, New Delhi, 2012

Jiawei Han and Micheline Kamber, (2008), Data Mining Concepts and Techniques, Second Edition, Elsevier, Reprinted.

K.P. Soman, Shyam Diwakar and V. Ajay,(2006), Insight into Data mining Theory and Practice, Easter EconomyEdition, Prentice Hallof India.

G. K. Gupta, (2006), Introduction to Data Mining with Case Studies, Easter Economy Edition, Prentice Hall of India.

Marakas, George M, Modern Data Warehousing, Mining, and Visualiza Visualization, Pearson Education, 2011

Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Pearson Education. Prabhu, (2012), DataWarehousing, PHI Learning Private Limited, New Delhi.

Ponniah, Paulraj, (2011), DataWarehousing Fundamentals, JohnWiley & Sons, New Delhi.

16 hrs

10hrs

10hrs

Total: 60 Hours

12hrs

MCA154A01 THEORY OF COMPUTATION

Credits: 3

Objectives:

It deals with all aspects of theoretical computer science, namely automata, formal languages, Computability and complexity

Unit 1: Review of Mathematical Preliminaries

Set, Strings, Alphabet and Languages

Unit 2: Finite Automata

Deterministic Finite Automata, Non Deterministic Finite Automata, Equivalence of NFA and DFA with proof, Automaton with E-moves, FSM with output (Moore and Mealy machine), Examples of lexical analyser, two way automaton. Regular Expressions and their equivalence to finite automata.

Unit 3: Regular Expressions and languages

Regular Expressions and their equivalence to finite automata, Regular Sets and their properties, Pumping lemma for regular sets, Decision algorithms, Minimization automata, Minimization algorithm.

Unit 4: Context Free Grammar

Grammars and their type, Context Free Grammars, Derivation Trees, Simplification of context Free Grammars, Normal form of Chomsky and Griebach.

Unit 5: Push down Automata & Turing Machines

Push down Automata and Context Free Languages, Equivalence of PDAs and CFLs, Turing Machines, Properties if recursive and recursively languages, Greibach Theorem, Recursive function theory.

References:

Daniel I.A. Cohen, Introduction to Computer Theory, Wiley, Second edition Hopcroft Lewis H.R and C.H. Papa dimitriou, *Elements of the theory of Computation*, Pearson Education Asia 2nd Edition.

LewishPapadimutrau, Theory of Computation, Prentice Hall of India, New Delhi.

Mishra & Chander Shekhar, Theory of Computer Science (Automate, Language & Computations), PHI. Moret B.M, The Theory of Computation, Pearson Education Asia.

Motwani R and J.D. Ullamn, Introduction to Automata Theory, anguages and Computation, Pearson Education Asia. 2nd Edition.

Peter linz, An Introduction to formal language and automata, Third edition, Narosa publication.

MCA154B01 ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

Credits: 3

Total: 60 Hours

Objectives:

To introduce basic concepts, techniques of artificial intelligence and provide insights into active research. The goal of this course is to have students develop concepts and skills associated with problems that are classified as requiring intelligence for their solution.

12hrs

Total: 60 Hours

12hrs

12hrs

12hrs

Unit 1: Introduction to Artificial Intelligence

Definition, AI Applications, AI representation, Properties of internal representation, Heuristic search techniques, best first search, mean and end analysis, A* and AO* algorithm.

Unit 2: Game Playing and Artificial programming languages

Introduction to LISP: List manipulations, functions, predicates, and conditionals, input, output and logical variables, iteration and recursion. Lists and arrays. Introduction to PROLOG.

Game Playing: Min-max algorithm, alpha-beta cutoff, waiting for quiescence, secondary search.

Unit 2: Knowledge Representation:

Knowledge Representation; Knowledge, general concepts, predicate logic, representing simple fact, instance and ISA relationships, resolution, natural deduction. Non monotonic reasoning, TMS (Truth Maintenance System), Semantic Nets, Frames, Scripts, Conceptual Dependency.

Predicate Logic: Representing simple facts in logic representing instance &its relationships, computable functions and predicates, resolution natural deduction.

Unit 4: Perception and NLP

Action, Robot architecture, vision, texture and images, representing and recognizing scenes, waltz algorithm, constraint satisfaction, trihedral and non-trihedral figures.

Natural Language Processing: NLP and pragmatic, syntactic and semantic analysis, RTN and ATN, understanding sentences.

Unit 5: Neural Networks and Expert systems

Introduction to Neural Networks, Neural Network architecture, Perceptron and applications of neural networks.

Expert System: Utilization and functionality, architecture of Expert System, Knowledge representation in expert systems and case studies.

References:

Graham, (1996). ANSI Common LISP, Prentice Hall.

Nilson N.J., (1980). Principles of Artificial Intelligence, Berlin: Springer Verlag.

Patterson, D.W. (1990). Introduction to Artificial Intelligence and Expert System, New Delhi: Prentice hall of India.

Rich, E & Knight, (2003). Artificial Intelligence, Tata McGraw Hill Publications

Rolston.D.W, Principles of AI & Expert System Development, Tata MacGraw Hill Publications

MCA154C01 XML AND WEB SERVICES

Credits: 3

Objectives:

To study the basics of XML, web services and concepts and to enable the students to develop their creativity in the web services.

Unit 1: Introduction

Role of XML; XML and the Web-XML language basics; SOAP; Web Services; Revolutions of XML;Service Oriented Architecture (SOA).

12hrs

12hrs

12hrs

12hrs

Total: 60 Hours

12hrs

Unit 2: XML Technology

XML;Name spaces;Structuring with schemas and DTD;Presentation Techniques; Transformation;XML infrastructure.

Unit 3: SOAP

Overview SOAP:HTTP:XML: ROP:SOAP: of Protocol: Message structure-Intermediaries; Actors; Design patterns and Faults; SOAP with attachments.

Unit 4: Web services

Overview; Architecture-key technologies; UDDI; WSDL; ebXML; SOAP and web services in ECom: Overview of .NET and J2EE.

Unit 5: XML Security

Security overview; canonicalization; XML security; Framework; XML Encryption; XML Digital signature;XKMS Structure;Guidelines for signing XML documents;XML in practice.

References:

Frank. P.Coyle. (2002), XML, Web services and the data Revolution. Pearson Education. McGovern et al. (2005). Java web services architecture. Morgan Kaufmann Pub. Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh (2004). Developing java Web services. Wiley Pub.

Sandeepchatterjee. (2004). Developing Enterprise web services. Pearson Education.

MCA154D01 MANAGERIAL SKILLS FOR IT PROFESSIONALS

Credits: 3

Objectives:

- To familiarize with the basic managerial concepts related to General Management, Project Management and Human Resource Management
- To understand the foundations for individual and group behavior in organizations •
- To acquire the contemporary managerial skills for modern IT professionals

Unit 1: Introduction to Management and Organizations

Meaning, nature and importance of management; Management Yesterday and Today. Basic Managerial skills for IT professionals, Principles of management; Major School of Management thought. Organizational Structure and Design.

Unit 2: Management Functions and Techniques

Challenges of today's business organizations, Decision-Making: The Essence of the Manager's Job. Foundations of Planning, Importance of planning tools and techniques.

Unit 3: Project Management

Project definition – contract management, activities covered by software project management, Operations Management.

Unit 4: Human Resource Management & Organizational Behavior

Concept and objectives of human resource management. Traditional and modem perspectives in HRM; Basic HR Functions; Contemporary global trends in HRM.

Total: 60 Hours

12hrs

12hrs

12hrs

12hrs

12hrs

12hrs

12hrs

Organizational Behavior: Foundations of individual behavior-personality; perception; learning; values, attitudes and job satisfaction; ability and motivation. Foundations of group behavior; Communication and group decision making; Leadership: power and politics, conflict.

Unit 5: Contemporary Management Competencies for IT Professionals 12hrs

Time Management Skills, Effective Communication Skills, Problem Solving Skills, Crisis Management, Work-Life Balance and Life Skills.

References:

George, Jennifer M., & Jones, Gareth R. (2007).*Contemporary Management* (5th ed.). McGraw-Hill/Irwin. Robbins, Stephen P, and Coulter, Mary. (2007).*Management*.(9th ed.). Prentice Hall Whetten, David A., & Cameron, Kim S. (2007) *Developing Management Skills*.(7thed.). Pearson Prentice Hall

MCA154S01 CLOUD COMPUTING

Credits: 3

Objectives:

- To introduce the broad perceptive of cloud architecture and model
- To understand the concept of Virtualization and design of cloud Services
- To be familiar with the lead players in cloud
- To understand the features of cloud simulator
- To apply different cloud programming model as per need
- To learn to design the trusted cloud Computing system

Unit 1: Introduction

Essentials, Benefits and need for Cloud Computing - Business and IT Perspective - Cloud and Virtualization - Cloud Services Requirements - Cloud and Dynamic Infrastructure - Cloud Computing Characteristics Cloud Adoption.

Cloud Models: Cloud Characteristics - Measured Service - Cloud Models - Security in a Public Cloud Public versus Private Clouds - Cloud Infrastructure Self Service

Cloud as a Service: Gamut of Cloud Solutions - Principal Technologies - Cloud Strategy Cloud Design and Implementation using SOA - Conceptual Cloud Model - Cloud Service Defined.

Unit 2: Cloud Solutions

Cloud Ecosystem - Cloud Business Process Management - Cloud Service Management - Cloud Stack - Computing on Demand (CoD) – Cloud sources.

Cloud Offerings: Information Storage, Retrieval, Archive and Protection - Cloud Analytics Testing under Cloud - Information Security - Virtual Desktop Infrastructure - Storage Cloud.

Cloud Management: Resiliency – Provisioning - Asset Management - Cloud Governance - High Availability and Disaster Recovery - Charging Models, Usage Reporting, Billing and Metering.

Unit 3: Cloud Virtualization Technology

12hrs

Total: 60 Hours

1

12hrs

Virtualization Defined - Virtualization Benefits - Server Virtualization - Virtualization for x86 Architecture - Hypervisor Management Software - Logical Partitioning (LPAR) - VIO Server - Virtual Infrastructure Requirements.

Cloud Virtualization: Storage virtualization - Storage Area Networks - Network-Attached storage - Cloud Server Virtualization - Virtualized Data Center.

Unit 4: Cloud and SOA

SOA Journey to Infrastructure - SOA and Cloud - SOA Defined - SOA and IaaS - SOA-based Cloud Infrastructure Steps - SOA Business and IT Services.

Cloud Infrastructure Benchmarking: OLTP Benchmark - Business Intelligence Benchmark - e-Business Benchmark - ISV Benchmarks - Cloud Performance Data Collection and Performance Monitoring Commands - Benchmark Tools.

Unit 5: Security in the cloud

Security Overview, Cloud Security Challenges and Risks, Software-as-a-Service Security, Security Governance, Risk Management, Security Monitoring, Security Architecture Design, Data Security, Application Security, Virtual Machine Security, Identity Management and Access Control, Autonomic Security.

References:

Dr. Kumar Saurabh, Cloud Computing – Insight into New Era Infrastructure, , Wiley India. Gautam Shroff, (2011) Enterprise CloudComputing, Cambridge University Press. Roger Jennings, Cloud Computing, , Wiley India John Rhoton .*Cloud Computing Explained*, . Recursive Press Judith Hurwiz, Cloud Computing for Dummies, , Wiley Publishing. Rosenberg and Matheos, The Cloud at your service, Manning Publications Ronald L. Krutz, Russell Dean Vines,(2010) Cloud Security - A comprehensive Guide to Secure Cloud *Computing*, Wiley – India. Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, (2013), Mastering Cloud Computing, TMGH.2013.

MCA154T01 SOFTWARE TESTING AND QUALITY MANAGEMENT

Credits: 3

Objectives:

The course looks at the role of software test engineers in areas such as test plan, test design, test execution and defect tracking. It explains how to review and manage test requirements and how to incorporate testing into the software development life cycle.

Unit 1: Introduction to Software Testing

Human and errors, Testing and Debugging, Software Quality, Requirement Behavior and Correctness, Verification, Validation, Quality Control, Quality Assurance, Fundamentals of Test Process, Psychology of Testing, General Principles of Testing, Test Metrics, Origin of defects, Defect classes and Defect repository.

Total: 60 Hours

12hrs

12hrs

Unit 2: Testing in SDLC

Review of software development models - Waterfall Models, Spiral Model, W Model, V Model, Agile Methodology and Its Impact on testing, Test Levels - Unit, Component, Module, Integration, System, Acceptance, Generic.

Unit 3: Types of Testing

Static Testing - Static Analysis, Control flow & Data flow, Determining Metrics; Dynamic Testing -Black Box Testing, Equivalence Class Partitioning, Boundary Value Analysis, State Transition Test, Cause Effect Graphing and Decision Table Technique and Used Case Testing and Advanced black box techniques; White Box Testing, Statement Coverage, Branch Coverage, Test of Conditions, Path Coverage, Advanced White Box Techniques, Instrumentation and Tool Support; Gray Box Testing, Intuitive and Experience Based Testing

Unit 4: Test Management

Test Organization - Test teams, tasks and Qualifications; Test Planning - Quality Assurance Plan, Test Plan, Prioritization Plan, Test Exit Criteria; Test Strategies - Preventive versus Reactive Approach, Analytical versus heuristic Approach; Test Activity Management, Incident Management, Configuration Management Test Progress Monitoring and Control; Specialized Testing - Performance, Load, Stress & Security Testing

Unit 5: Tools and techniques

Automation of Test Execution, Requirement tracker, High Level Review ; Types of test Tools - Tools for test management and Control, Test Specification, Static Testing, Dynamic Testing, Non-functional testing; Selection and Introduction of Test Tools - Tool Selection and Introduction, Cost Effectiveness of Tool Introduction.

References:

AdityaP.Mathur, "Foundations of Software Testing", Pearson Education, 2008.

Andreas Spillner, Tilo Linz, Hans Schaefer, "Software Testing Foundations", Shoff Publishers and Distributors

Boris Beizer, "Software Testing Techniques", Second Edition, Dreamtech, 2003

Elfriede Dustin, "Effective Software Testing", First Edition, Pearson Education, 2003.

RenuRajani, Pradeep Oak, "Software Testing, Effective Methods, Tools and Techniques", Tata McGraw Hill, 2004.

SrinivasanDesikan and Gopalaswamy Ramesh, "Software Testing, Principles and Practices", Pearson education, 2006.

MCA154U01 MULTIMEDIA COMMUNICATIONS

Credits: 3

Objectives:

To study the graphics techniques and algorithms, the multimedia concepts and various I/O technologies and to enable the students to develop their creativity

Unit 1: Introduction

What are Multimedia; multimedia application; Goal and objectives; Multimedia building blocks; Multimedia and Internet? Multimedia Configuration: Multimedia PC workstation components;

12Hrs

12hrs

12hrs

Total: 60 Hours

Unit 2: Multimedia Audio and Graphics

Basic sound concepts; audio capture; music; speech sound processor; sound recovery technique; VOC4WAV file formats for sound; Multimedia graphics: 2D/3D animation fundamentals; color modules DIGITAL IMAGING: still and moving images; video capture animation video; Processing; video recovery techniques; AVO; AVI file formats; NTSC; PAL; SECAM; HDTV; system video/audio conferencing techniques and standards; video streaming; motion of synchronization.

Unit 3: Image Compression techniques

LZW; DCT run length coding; JPEG; MPEG; standard hypertext MHEG; Hypertext and Hypermedia; document architecture ODA: MHEG.

Unit 4: Augmented and virtual reality and multimedia

Concept; VR devices: hand Gloves; head mounted tracking system; V R Chair; CCD; VCR;3D; sound system; Head Mounted Displays and rendering software setup; Virtual objects; VRML.

Unit 5: Multimedia devices

Mass storage systems for multimedia requirements; Magnetic devices; Optical devices; CDROM; DVD. Scanners: Types and specifications; Windows support to Multimedia: Multimedia Databases (in Oracle); multimedia function calls; windows support for sound; animation; movies; music and midi controls; Case study on Multimedia.

References:

Aitken Jarol, (1995). Visual C++ Multimedia Adventure Set. Coriolis Group books. Durano R Begault, (2003). Virtual Reality and Multimedia. AP Professionals. Joe Gradicki, (1994). Virtual reality Construction Kit. Jhon Wile & Sons Inc. Judith Jefcoate, (1998). Multimedia in Practice, Technology and Application. PHI. Kris Jama, Phil Schmauder, Nelson Yee, (2003). VRML Programmer's Library. Galgotia Michael J Young, (2004. Windows multimedia and animation with C++ programming for Win95. AP Professional.

Ralf Steinmetz & KlaraNahrStedt, (2003). Multimedia - Computing, Communications and Applications. PHI Publications.

MCA154V01 MOBILE COMPUTING

Credits: 3

Objectives:

To understand the basic concepts of mobile computing, familiarize with the network protocol stack, learn the basics of mobile telecommunication system, exposed to Ad-Hoc networks and to gain knowledge about different mobile platforms and application development.

Unit 1: Introduction

Mobile Computing - Mobile Computing Vs wireless Networking - Mobile Computing Applications -Characteristics of Mobile computing - Structure of Mobile Computing Application. MAC Protocols -Wireless MAC Issues - Fixed Assignment Schemes - Random Assignment Schemes - Reservation Based Schemes.

12hrs

12hrs

Total: 60 Hours

12 hrs

12hrs

Unit 2: Mobile Internet Protocol and Transport Layer

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.

Unit 3: Mobile telecommunication System

Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

Unit 4: Mobile Ad-Hoc Networks

Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols – Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.

Unit 5: Mobile Platforms and Applications

Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, Windows Phone – M-Commerce – Structure – Pros & Cons – Mobile Payment System –Security Issues.

References:

Android Developers : http://developer.android.com/index.html Apple Developer : <u>https://developer.apple.com/</u>

C.K.Toh, (2002), AdHoc Mobile Wireless Networks, First Edition, Pearson Education.

Dharma Prakash Agarval, Qing & An Zeng, (2005), Introduction to Wireless and Mobile system", Thomson Asia Pvt Ltd.

Jochen H. Schller, (2007), *Mobile Communications*, Second Edition, Pearson Education, New Delhi. Prasant Kumar Pattnaik & Rajib Mall,(2012), *Fundamentals of Mobile Computing*, PHI, Learning Pvt. Ltd, New Delhi.

Uwe Hansmann & Lothar Merk, Martin S. Nicklons and Thomas Stober, (2003), *Principles of Mobile Computing*, Springer.

William.C.Y.Lee,(2006), *Mobile Cellular Telecommunications-Analog and Digital Systems*, Second Edition, Tata Mc Graw Hill Edition.

Windows Phone Dev Center : http://developer.windowsphone.com

12 hrs

12 hrs

12 hrs

MCA1542L1 NETWORK PROGRAMMING LAB

- 1. Simple Message Passing Program.
- 2. Implementation of Client-Server Communication Using TCP.
- 3. Simple Chat Application
- 4. Java Socket Program for EchoServer and EchoClient Communication.
- 5. Implementation of File Transfer Protocol.
- 6. Implementation of CRC.
- 7. Implementation of Checksum.
- 8. Implementation of Bit Stuffing
- 9. Implementation of Sliding Window.
- 10. Reading IP and port ID from command line and sending message to server.
- 11. Implementation of Http Client.
- 12. Java Program for Message Group Window.
- 13. Implementation Of Peer to Peer connection using UDP.
- 14. Java Multicasting Program

MCA1542P1 ENTERPRISE COMPUTING PROJECT

The main deliverables of the course come from a self-proposed project. Students (individually or teams of maximum 2) will design, propose, and implement a project relevant to the enterprise computing theme using J2EE technologies. Typically, this will be the construction of some system component supporting enterprise computing (e.g., electronic commerce or supply chain) or an enterprise application. Other ideas are certainly possible. You are encouraged to discuss your ideas with the instructor and TA before proceeding to the proposal stage. A project report must be submitted by each team as the deliverable.

MCA155201 SYSTEMS SOFTWARE

Credits: 3

Objectives:

- To understand the relationship between system software and machine architecture.
- To understand the processing of an HLL program for execution on a computer system
- To understand the process of scanning and parsing.
- To know the design and implementation of assemblers, macro processor, linker and compiler.
- To have an understanding of loader, system software tools.

Unit 1: Introduction

System Software and machine architecture, the simplified instructional computer(SIC), machine architecture, data and instruction formats, addressing modes, instruction sets, I/O and programming

Unit 2: Assemblers

Basic assembler functions, A simple SIC assembler, Assembelsr algorithm and data structures, Machine dependent assembler formats, instruction formats and addressing modes, program relocation, machine indenpendet assembler features, literals, symbol –defining statements, expressions, one pass assemblers and multi pass assemblers, implementation example, MASM assembler.

Unit 3: Loaders and linkers

Basic loader functions, design of an absolute loader, a simple bootstrap loader, machine dependent loader features, relocation, program linking, algorithm and data structures for linking loader, machine independent loader features, automatic library search, loader options, loader design options, linking editors, dynamic linking, bootstrap loaders, implementation example, MSDOS linker.

Unit 4: Macro Processors

Basic macro processor functions, macro definition and expansion, Macro processor algorithm and data structures, Machine independent macro processor features, concatenation of macro parameters, generation of unique labels, conditional macro expansion, keyword macro parameters, macro within macro, implementation example, MASM macro processor, ANSI macro language.

Unit 5: System Software tools

Text editor, overview of Editing process, User interface, editor structure, interactive debugging systems, debugging functions and capabilities, relationship with other parts of the system, user interface criteria.

References:

Dhamdhere DM, (2000), Systems programming and operating Systems, 2nd ed, TMG.

John J Donovan, Systems Prorgamming, (2000), Tata Mcgraw Hill Edition.

John Levine R, Linkers and Loaders, (2000) - Harcourt india pvt ltd, Morgan Kaufmann publishers

Leland L.Beck, (2006), System Software- An introduction to Systems programming, (3rd ed), Pearson Education Asia.

12 Hours

12 Hours

12 Hours

12 Hours

12 Hours

Total: 60 Hours

MCA155202 INFORMATION SECURITY

Credits: 3

Objectives:

This subject aims to help students to get through knowledge about network and information security. At the end of the semester the students should have knowledge about various cryptographic algorithms and comparative study of the algorithms, about email security and secured electronic transactions and brief knowledge about intruders and viruses.

Unit 1:

Network Security Fundamentals: Introduction, Computer Security Concepts, the OSI Security Architecture, Types of Security Attacks, Security Services, Security Mechanisms, A Model for Network Security, Standards. Symmetric Encryption and Message Confidentiality: Symmetric Encryption Principles, Symmetric Block Encryption Algorithms, Cipher Block Modes of Operation.

Unit 2:

Public-Key Cryptography and Message Authentication: Approaches to Message Authentication, Secure Hash Functions, Message Authentication Codes, Public-Key Cryptography Principles, Public-Key Cryptography Algorithms RSA and Diffie-Hellman Key Exchange, Digital Signatures.

Unit 3:

Key Distribution and User Authentication: Symmetric Key Distribution Using Symmetric Encryption, Kerberos, Key Distribution Using Asymmetric Encryption, X.509 Certificates, Public-Key Infrastructure, Federated Identity Management. Transport-Level Security: Web Security Considerations, Secure Socket Layer and Transport Layer Security, Secured TCP - extension of three way handshaking method. HTTPS.

Unit 4:

Wireless Network Security: IEEE 802.11 Wireless LAN Overview, IEEE 802.11i Wireless LAN Security, Wireless Application Protocol Overview, Wireless Transport Layer Security, WAP End-to-End Security. Electronic Mail Security: Pretty Good Privacy, S/MIME, Domain Keys Identified Mail. IP Security: IP Security Overview, IP Security Policy, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange.

Unit 5:

Intruders: Intruders, Intrusion Detection, Password Management, And Malicious Software: Types of Malicious Software, Hackers, Types of Hackers, Viruses, Virus Countermeasures, Worms, Distributed Denial of Service Attacks. Firewalls: The Need for Firewalls, Firewall Characteristics, Types of Firewalls, Firewall Basing, Firewall Location and Configurations.

References:

Kaufman Perlman and Speciner, Network Security, PHI Publications. William Stallings, Network security Essentials: Applications and Standards, Pearson Education, 4th Edition, 2011.

William Stallings, Cryptography and Network Security, Pearson Education.

12 Hours

12 Hours

12 Hours

12 Hours

12 Hours

Total: 60 Hours

MCA155203 OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

Credits: 3

Objectives:

To provide the knowledge and skills required to use UML notation, the industry standard for documenting and communicating the analysis and design of an object-oriented project.

Unit 1: Introduction to UML

Introduction to object oriented concepts like inheritance, Polymorphism, Information hiding; Importance of modeling; principles of modeling; Object oriented modeling; An overview of UML; conceptual model of the UML; Architecture; Software Development life cycle.

Unit 2: Basic Structural Modelling

Classes - Terms and concepts, Common modeling techniques; Relationships - Modeling simple dependencies, Single inheritance and structural relationships; Common mechanisms and diagrams;

Advanced Structural Modeling

Advanced classes; advanced relationships; Interfaces; Types and Roles; Packages; Instances, Classes and Object Diagrams

Unit 3: Basic Behavioral Modelling-I

Interactions - Terms and concepts, modeling a flow of control; Interaction diagrams - Terms and concepts, modeling flows of control by time ordering and control by organization, Forward and reverse engineering

Basic behavioral Modelling-II

Use cases-terms and concepts, modeling the behavior of the element, Use case Diagrams - Terms and concepts, modeling the context of a system and requirement of a system, forward and reverse Engineering, Activity Diagrams-Terms and concepts, modeling a workflow and an operation, Forward and reverse engineering.

Unit 4: Advanced Behavioral Modelling

Events and signals - modeling a family of signals and exceptions, state machines modeling the lifetime of an object, state machines, processes and Threads-modeling multiple flows of control and inter process communication, time and space-modeling timing constraints, distribution of objects and objects that migrate, state chart diagrams-modeling reactive objects and Forward and reverse Engineering.

Unit 5: Architectural modelling

Component - Terms and concepts, modeling executables and Libraries, modeling tables, file, and documents, modeling an API, modeling source code, Deployment-modeling processors and devices, modeling the distribution of components, Component diagrams-modeling source code, executable release, physical database, Adaptable Systems, Forward and reverse Engineering and Deployment diagrams-modeling an embedded systems, Client/server System, Fully distributed systems, Forward and reverse Engineering.

CASE STUDIES: Model all the views of: Automation of a Library, Point of Sales System

References:

Cay Horstmann (2004), Object-Oriented Design And Patterns, Wiley India edition, New Delhi, India.

Total: 60 Hours

10hrs

14hrs

12hrs

12hrs

Meilir Page-Jones (2000), Fundamentals of Object Oriented Design in UML, Pearson Education, New York.

Craig Larman (2005). An introduction to Object –Oriented Analysis and Design and Unified Process Appling UML and Patterns, 3rd edition, Pearson Education, New Delhi, India.

Grady Booch, James Rumbaugh, Ivar Jacobson (2009), The Unified Modeling Language User guide, 2nd edition, Pearson Education, New Delhi, India.

John W. Satzinger, Robert B Jackson, Stephen D Burd (2004), Object-Oriented Analysis and Design with the Unified Process, Cengage learning, India.

MCA155A01 EMBEDDED SYSTEMS

Credits: 3

Objectives:

Embedded system is an emerging technology. There is a huge opening for Embedded System Engineers. In order to make the students aware this new technology this syllabus prescribed.

Unit 1: Introduction to 8051 microcontroller

Comparison between micro controller and general purpose microprocessor; different types of microcontrollers; Architecture of 8051; key features of 8051; I/O ports; memory organization; counters and timers; serial I/O ports; interrupts of 8051.

Unit 2: 8051 Instruction Set & Assembly Language programming

Addressing modes of 8051; instruction set; data move; arithmetic; logical; jump and call Instructions; Program for data transfer; Memory operations; arithmetic; logical; sorting.

Unit 3: Programming and Debugging Using Keil C

Different types of Header files, declaration of variables, operators, Macro declaration; inclusion of files; I/O functions; String functions; Basic debugging concept; Logic analyzer programming; Timer simulation; I/O port simulation and debug; Program for RPM counting; Program for PWM.

Unit 4: External Peripheral Interfacing

Interfacing switches; LEDs; Matrix Keyboard; Seven Segment Displays; 16 x 2 LCD; pulse measurement; analog to digital and digital to analog converters; interrupt programming; PC interfacing.

Unit 5: Real Time Software Development

Architecture: Study of different architectures; simple Round Robin; Round Robin with Interrupt; Token passing method; Semaphores; Interrupt Latency; RTOS; RTOS applications; VxWorks RTOS study; RTC interfacing with RTOS; Selection procedure for Microcontrollers; SPI mode of operation.

References:

Douglas V Hall, (2000). *Microprocessor and Interfacing*. (3rd ed.). Tata McGraw Hill.

Kenneth J Ayala, (2005), The 8051 microcontroller Architecture programming and Applications. Penram International Publishing Pvt. Ltd.,

Muhammad Ali Mazidi and Mazidi&McKinlayR.D, (2006). The 8051 Microcontroller and Embedded system.

Raj Kamal, (2005), Microcontroller Architecture programming Interfacing and system design, Pearson Education.

Ram.B, (2000), Fundamentals of Microprocessor & Microcomputer. DanpatRai Publication.

12hrs

Total: 60 Hours

12hrs

12hrs

12hrs

MCA155B01 COMPILER DESIGN

Credits: 3

Objectives:

To learn and understand the design of a compiler and also the knowledge of using the tools for construction of a compiler

Unit 1:

Introduction to Compiler; Compiler and Translators; Phases of Compilation; One pass compiler; Lexical Analysis; Role of Lexical Analyzer; Regular Expressions; Finite Automata; Design of lexical Analyzer; Context free grammars; Parse trees; Ambiguous grammars.

Unit 2:

Parsers; Shift reduce parsing; Operator precedence parsing; Top down parsing Predictive parsers; Simple precedence parsers; LR parsers; SLR parser tables; LALR parsing tables.

Unit 3:

Syntax directed translation; Construction of syntax trees; Evaluation of S attributed and L attributed definitions; Top down Translation; Recursive evaluators; Type checking; Simple type checker; Type conversions; Overloading of functions and operators; Polymorphic functions; Run time environment; Source language issues; Storage organization; Storage Allocation; symbol tables; Dynamic storage allocation techniques.

Unit 4:

Intermediate code generation; Languages; Declarations; Assignment statements; Boolean expression; Case statements –Backpatching, Procedure Calls.

Unit 5:

Code optimization; Sources of optimization; Basic blocks; Loops; Global Data Flow analysis; Solution of data flow equations; Code improving transformations; Dealing with aliases; Data Flow analysis of flow graphs; Symbolic debugging of optimized code; Code generations; Issues in the design of code generator; Simple code generator Register allocation and assignment; DAG representations; PEEP hole optimization; generation of code from DAG's; Code generation algorithm.

References:

Aho Ravi Sethi A.V and J.D Ullman,(2004). *Compiler, Principles, Techniques and Tool.* Pearson Education.

Aho Ravi Sethi and J.D Ullman, (1987). *The Principles of Compiler Design*. Narosa Publishing House. Bennet.J.P, (2003). *Introduction to Compiler Techniques*. (2nd ed.). Tata McGrawHill. Dhamdhere.D.M, (1983). *Compiler Construction Principles and Practice*. McMillian India Ltd. Galles, *Modern Compiler Design*.

Kenneth C. Louden, (2003). Compiler Construction: Principles and Practice. Thompson Learning.

12hrs

12hrs

Total: 60 Hours

12hrs

12hrs

MCA155C01 SIMULATION AND MODELING

Credits: 3

Objectives:

To understand the needs for simulation and simulation methodologies.

Unit 1: System Models and Behaviors

Concept of a system; environment; stochastic activities; continuous and discrete system; system modeling; types of models; system studies.

Unit 2: Analytical System Simulation Techniques

Monte-Carlo methods; Numerical computation techniques; Lag models; distribute lag model and cobweb model.

Discrete system simulation: Discrete events, Representation of Time, Generation of Arrival Patterns, Telephone System Simulation, Simulation Programming Tasks, Gathering Statistics, Counters and Summary Statistics, Measuring Utilization and Occupancy, Discrete Simulation Languages.

Different Queuing models and studies

Unit 3: Simulation Languages

Introduction to Simscript; management of sets in Simscript; GPSS; GPSS model of a simple telephone system data structures.

Unit 4: Simulation System building paradigms

Time-oriented and event-oriented; message-oriented; knowledge-based Simulation engine development; output: Estimation methods; simulation statistics; replication of runs; batch Analysis of simulation means; regenerative techniques; time series analysis; spectral analysis and autoregressive means.

Unit 5: Simulation of Business Applications

Equipment maintenance; warehouse management; facility utilization; workflow management; project management.

References:

Birta, Loius G and Arbez, Gilbert A, Modeling and Simulation: Exploring Dynamic System Behaviour, Springer. Gordon G. System simulation. Prentice Hall Caroll J. M, (2004). Simulation using personal computers, 001.64044, C239. GottfriedB. S, Elements of stochastic process simulation, 001.424, G71E. Law, Averill M, Simulation Modeling and Analysis. (3rded.), Tata McGrawHill.

Seila, Andrew, Applied Simulation Modeling, Thomson Learning,

MCA155D01 E-COMMERCE and M-COMMERCE

Credits: 3

Total: 60 Hours

Objectives:

12hrs

12hrs

12hrs

12hrs

12hrs

Total: 60 Hours

To obtain knowledge of Internet hardware associated with E-commerce systems, to gain knowledge of selected Standard application commonly used in business, to design a fundamental E-Business concept, to gain knowledge of the issues of network security and business-tech protocols, and to Introduction to Mobile commerce, framework and M-Com models.

Unit1:

Electronic Commerce Framework, Electronic Commerce and Media Convergence, The anatomy of E-Commerce Applications, Electronic Commerce Consumer Applications, Electronic Commerce Organization Applications. Market forces influencing the I-Way, Components of the I-Way, Network Access Equipment, The Last Mile: Local Roads and Access Ramps, Global Information Distribution Networks, Public Policy issues shaping the I Way.

Unit 2:

Architectural Framework for Electronic Commerce, Information Technology Act, definition, important terms under information technology legislation 2008, certifying authority, cyber regulations appellate tribunal, offences and penalties, Security and the Web, Consumer-Oriented Applications, Mercantile models forms the Consumer's perspective, mercantile models from the merchant's perspective.

Unit 3:

Types of Electronic Payment systems, Digital token based electronic payment systems, Smart Cards and Electronic Payment Systems, Credit card based electronic Payment Systems, Risk and Electronic Payment Systems, Risk and Electronic Payment Systems, Designing Electronic Payment Systems. Electronic Data Interchange, EDI Applications in business, EDI: Legal, Security and Privacy issues, EDI and electronic Commerce.

Unit 4:

Introduction, Infrastructure of M–Commerce, Types Of Mobile Commerce Services, Technologies Of Wireless Business, Benefits And Limitations, Support, Mobile Marketing & Advertisement, Non–Internet Applications In M–Commerce, Wireless/Wired Commerce Comparisons.

Unit 5:

A Framework for the study of Mobile Commerce, NTT DoCoMo's I-Mode, Wireless Devices For Mobile Commerce, Towards A Classification Framework For Mobile Location Based Services, Wireless Personal And Local Area Networks, The Impact Of Technology Advances On Strategy Formulation In Mobile Communications Networks.

References:

Brian Mennecke.E, J. Troy Strader, (2003). Mobile Commerce: Technology, Theory and Applications.
Idea Group Inc., IRM press.
JefferyF.Rayport, Bernard J.Jaworski, (2002). E-Commerce. Tata McGraw Hill Publications
Joseph.P.J, (2003). E-commerce – A Managerial Perspective. Prentice Hall
Louis.P.J, (2001). M-Commerce Crash Course. McGraw-Hill Companies February.
Paul May, (2001). Mobile Commerce: Opportunities, Applications, and Technologies of Wireless
Business. Cambridge University Press.
Ravi Kalakota, Andrew Winston, (2003). Frontiers of Electronic Commerce. Pearson Education.

MCA155S01 DATA ANALYTICS

Credits: 3

Total: 60 Hours

Objectives:

The course is designed to provide in-depth knowledge of handling data and Business Analytics tools that can be used for fact-based decision-making. At the end of the course, the participants will be able to:

12hrs

12hrs

12hrs

12hrs

- Understand the role of business analytics within an organization. •
- Analyze data using statistical and data mining techniques and understand relationships between the underlying business processes of an organization.
- Use decision-making tools/Operations Research techniques. •
- Use advanced analytical tools to analyses complex problems under uncertainty. •

Unit 1: Business Analytics using Excel/SPSS

Different types of data; Data Visualization; Data visualization methods; Tables, Graphs, Charts, Histograms, Frequency distributions, Basic probability concepts, Conditional probability, Bayes Theorem, Probability distributions, Continuous and discrete distributions.

Unit 2: Advanced Analytics using SPSS

Regression models Simple linear regression: Coefficient of determination, Significance tests, multiple linear regressions: Non- linear regression; Logistic regression. Discriminant Analysis, Principal component analysis, Factor analysis.

Unit 3: Introduction to R Programming and R Studio

Overview of R, R data types and objects, reading and writing data, Control structures, functions, scoping rules, dates and times, Loop functions, Data import and export, Data Exploration.

Unit 4: Analytics using R

Decision trees, regression, clustering, Association rules, text mining, social network analysis, case study on forecast and prediction.

Unit 5: Bigdata Analytics using Hadoop

What is bigdata? Why?, Introduction to Hadoop, Hadoop distributed file system, components of Hadoop, analyzing big data with Hadoop, HDFS and MapReduce, case study on bigdata.

Reference Books:

Albright Winston Zappe, (2006). Data Analysis and Decision Making with Microsoft Excel Hobson *Publications*, 3rd Edition. Conrad Carlberg,(2008). Business Analysis with Microsoft Excel, Pearson Education, 3rd Ed. Naresh K. Malhotra. (2003) Marketing Research an Applied Orientation, Pearson Education. Thomas Devonport, Competing on analytics: The new science of winning

MCA155T01 SOFTWARE TESTING TOOLS

Credits: 3

Objectives:

The course is designed to get awareness and knowledge of software testing tools knowledge to make the software testing life cycle easy for execution. It explains the usage of different tools in different testing types, test management, defect life cycle.

Unit1: Introduction to Software Testing tools

An overview of Software testing tools; Open source tools; Licensed tools; Unit Testing tools; Functional automation testing tools; Performance testing tools: Load, Stress, Volume; Defect tracking tools, Test repository tools, Test management tools.

12hrs

12hrs

12hrs

12hrs

Total: 60 Hours

12hrs

Unit 2: Unit testing tools

JUnit – Java unit testing tool, C++ Test – C/C++ Unit testing tool, Rational Test RealTime Unit Testing tool.

Unit 3: Automation and Performance Testing tools

Automation testing tools : Selenium; software testing framework for web applications; Quick Test Professional; Keyword view; Expert view, Languages; Sikuli – to automate and test graphical user interfaces using screenshots; Silk Test – functional automation testing tool; Performance testing tools : Load Runner – application load testing, JMeter – heavy load simulator, Rational Performance Tester – performance testing tool to emulate various loads.

Unit 4: Mobile testing tools

Mobile Application testing tools: Mobile phone emulator, MobiReady, Responsivepx; Mobile Performance testing tools: mobitest, neotys, BlazeMeter; Mobile automation testing tools: eggON, Monkeytalk, Experitest

Unit 5: Test Management and Defect Tracking Tools

Quality Center – test management tool, TestLink – open source web based test management tool, IBM Rational Quality Manager; Defect Tracking tools: Bugzilla – bug tracking tool, ClearQuest – Rational's bug tracking tool.

References:

Dr. K.V.K.K. Prasad, "Software Testing Tools", Dreamtech Press. http://www.junit.org http://www.mobiready.co.uk http://www.onestoptesting.com/introduction/

MCA155U01 DIGITAL IMAGE PROCESSING

Credits: 3

Objectives:

To study the image fundamentals and mathematical transforms necessary for image processing, image enhancement techniques, image restoration procedures, image compression procedures and image segmentation and representation techniques

Unit 1: Digital image fundamentals

Elements of digital image processing systems, Vidicon and Digital Camera working principles, Elements of visual perception, brightness, contrast, hue, saturation, Mach band effect, Color image fundamentals - RGB, HSI models, Image sampling, Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms - DFT, DCT, KLT, SVD.

Unit 2: Image Enhancement

Histogram equalization and specification techniques, Noise distributions, Spatial averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Contra harmonic mean filters, Homomorphic filtering, Color image enhancement.

12hrs

12hrs

12hrs

12hrs

Total: 60 Hours

12hrs

Unit 2

Unit 3: Image Restoration

Image Restoration - degradation model, unconstrained restoration - Lagrange multiplier and constrained restoration, Inverse filtering-removal of blur caused by uniform linear motion, Wiener filtering, Geometric transformations-spatial transformations.

Unit 4: Image Segmentation

Edge detection, Edge linking via Hough transform – Thresholding - Region based segmentation – Region growing - Region splitting and Merging - Segmentation by morphological watersheds - basic concepts -Dam construction – Watershed 87, segmentation algorithm.

Unit 5: Image Compression

Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, Vector Ouantization, Transform coding. **JPEG** standard, MPEG.

References:

Anil K. Jain, Fundamentals of Digital Image Processing', Pearson 2002. Brookes/Cole, Vikas Publishing House, 2nd edition, 1999 Dudgeon.D.E and RM. Mersereau, , Multidimensional Digital Signal Processing', Prentice Hall Professional Technical Reference, 1990. Kenneth R. Castle man, Digital Image Processing, Pearson, 2006. Milan Sonka et al, 'IMAGE PROCESSING, ANALYSIS AND MACHINE VISION', Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing', Pearson, Second Edition, 2004. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,' Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.

William K. Pratt, , Digital Image Processing', John Wiley, New York, 2002

MCA155V01 DATABASE ADMINISTRATION

Credits: 3

Objectives:

- To provide Oracle professionals with an in-depth understanding of the DBA features of Oracle, specific Oracle concepts and knowledge required for the OCP & DBA exam.
- An in-depth exploration of the database architecture, including memory, process and data structures, and the management of those structures.
- Management of database files. •

Unit 1

Fundamental of SOL: Retrieving data using the SOL select statement, Restricting and sorting data, using single row function to customize output. Reporting aggregated data using the group function. Displaying data from multiple tables-II, Using sub queries to solve problems, Using set operators, Manipulating data, and Using DDL statements to create and manage tables.

12hrs

12hrs

12hrs

12hrs

Total: 60 Hours

Introduction to DBA, Oracle Database Architecture, Table space and Data files, managing the Oracle Instance: management framework, Staring and stopping Database Control, Oracle Enterprise manager, Accessing oracle enterprise manager, STARTUP an oracle database Instance, NOMOUNT, MOUNT, OPEN, SHUTDOWN an Oracle database Instance

Unit 3

Managing Database Storage Structure, Storage Structures, How table Database is stored, Creating a New Tablespace,Storage for Locally managed Tablespace,Tablespace in the Preconfigured Database, Altering a Tablespace,Action with tablespace,Droping a tablespace, Viewing a tablespace Information,Viewing a Tablespace contents,Enlarging the Database,Automatic Storage Management.

Unit 4

Administering User security: Database User Accounts, Predefine Accounts: SYS and SYSTEM, Creating a user, Authenticating a user, Administrator of user ,unlocking a user and rest a password, Privileges, Role: Creating a role, Assigning role to the user, Profiles and user, creating a Password profile, supplied password verification function. Assign quota to user

Unit 5

Managing undo Data: Data manipulation, undo Data, Transactions and undo Data, Storing undo Information, Undo vs Redo data, monitoring undo. Administering Undo. Configuring the Oracle Network Environment: oracle Net Services, oracle Net Listener, Establishing net Connection, Establishing a Connection, user sessions, Introduction to Backup and Recovery, Introduction Moving a Data.

References:

Ian Abramson, Michael Abbey, Michael J. Corey ,*Oracle Database 11g, A Beginner's Guide – (Oracle press)*.

Edward Whalen, Oracle Database 10g Linux administration, (Oracle press) Matthew Hart and Robert G.Freeman, Oracle Db 10G Rman Backup & (Oracle press) Recovery Julian Dyke, Steve Shaw, Pro Oracle database 10g RAC on Linux, press publications Murali Vallath, Oracle 10g RAC: grid, services & clustering, Digital Press

MCA1552P1 SOFTWARE PROJECT MANAGEMENT LAB

The students are supposed to develop a mini – project and also must manage the development process using any project management tools available. The students can do the project in a group (team) consisting of not more than 2 students. The project management principles must span across all the phases of a project. The team members will be able to demonstrate competency in the management of a project plan, especially in monitor and controlling a project schedule and budget, tracking project progress. A project report must be submitted by each team.

MCA155 (A/B/C) P1 ELECTIVE III PROJECT

The students are supposed to develop a mini – project for above mentioned lab. The students can do the project in a group (team) consisting of not more than 2 students. A project report must be submitted by each team.

MCA155AP1	Embedded Systems Project
MCA155BP1	Compiler Design Project

12hrs

12hrs



Simulation and Modeling Project

MCA1562P1 MAIN PROJECT

Individual Project Work and Viva Voce: 200 Marks Duration of the project is four months. During the project work the students should interact with the internal / external guides. Project review will be conducted twice in a month.

Internal marks for the project will be based on all the reviews and final demo of the project

Internal Marks: 50 and External Project Viva – Voce Marks: 150

Internal Marks

Each Review - 5 Marks (8 Reviews * 5 = 40 Marks) Preparatory Demo - 10

External Project Viva - Voce Marks

Report	25
Presentation	75
Viva – Voce	50
