Faculty of Engineering & Technology

Board of Studies in Computer Science & Engineering

Proposed Curriculum structure of Second Year M.C.A.

w.e.f. July 2009

Part – I

Sr. No.	Subject Code	Subjects	Teaching Scheme [Hours/Week]		Examination Scheme [Marks]			
			Lecture	Pract.	Theory	TW	Pract.	Total
01	MCA 201	Programming in Java	4	2	100	25	25	150
02	MCA 202	Database Management System	4	2	100	25	25	150
03	MCA 203	Operating System	4	2	100	25	25	150
04	MCA 204	Software Engineering	4	--	100	--	--	100
05	MCA 205	Microsoft Technologies Lab –I	--	4	--	50	50	100
Total of I			**16**	**10**	**400**	**125**	**125**	**650**

Part – II

Sr. No.	Subject Code	Subjects	Teaching Scheme [Hours/Week]		Examination Scheme [Marks]			
			Lecture	Pract	Theory	TW	Pract	Total
01	MCA 206	Design and Analysis of Algorithm	4	2	100	25	25	150
02	MCA 207	Computer Network	4	--	100	--	--	100
03	MCA 208	Linux Operating system	4	2	100	25	25	150
04	MCA 209	Data Warehousing and Data Mining	4	2	100	25	25	150
05	MCA 210	Microsoft Technologies Lab –II	--	4	--	50	50	100
		Total of II	**16**	**10**	**400**	**125**	**125**	**650**
Total of I and II					**800**	**250**	**250**	**1300**

Title of the Subject: Programming in Java
Course Code: MCA 201

Teaching Scheme:
Lectures: 4 Hrs/Week
Practical : 2 Hrs/Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Practical Exam: 25 Marks
Term Work: 25 Marks

Objectives:
- To learn programming skills using JAVA language
- To enhance ability of students for developing advance programs using Java which is required in IT industry

Contents -

Unit 1: (8 hrs)
Basics of Java: Java's importance to the internet, Java's Magic: The Byt Code, Java Buzzwords, Basic syntax of Java - Identifiers, Keywords & Data Types , Strings And Characters, Arithmetic Operators And Expressions, Type Conversion in Assignments, Comments

Classes in Java: Introduction to Methods, Constructors, This Keyword, Overloading Methods, Overloading Constructors, Using objects as Parameters, A closer look at argument passing, Returning objects, Understanding Static, Command Line Arguments.

Unit 2: (8 hrs)
Inheritance: Basics, Using Super, Method Overriding, Abstract methods and Class, Using Final with Inheritance, Packages, Importing Packages and Interfaces.

Exception handling: Fundamentals, Exception Types, Uncaught Exceptions, Using Try and Catch, Multiple Catch Clauses, Throw, throws, finally, Built-in Exceptions and creating your own Exception Sub Classes.

Unit 3: (8 hrs)
M**ultithreading:** Java Thread Model, The Main thread, Creating a Thread, Creating Multiple Threads, Using Alive ( ) and Join ( ),Thread Priorities, Synchronization, Interthread Communication, Suspending, Resuming and Stopping Threads.

Applets: An Overview of Applets, the Life Cycle of an Applet, creating applets, the Graphics Class, Using Colors, Displaying Text, Using Applets in a Web Page

Unit 5: (8 hrs)
JDBC: Basics of Database Connectivity, Introduction to JDBC, JDBC Architecture, Steps to create JDBC Application, insert, update, delete and select operations

I/O Package:
Files and Directories, Overview of Codes and Streams, Buffered Character Streams, Byte Streams

Text Books/ Reference Books:

1. Herbert Schildt: "The Complete Reference Java2", 5th Edition TMH Publications.
2. Deitel & Deitel: "How To Program JAVA", Pearson Education
3. E Balguruswamy: "Programming with Java- A Primer", TMH
4. Core Java Vol I and Vol II : Sun Microsystems Press

Reference websites:

1. www.java.sun.com/docs/books/tutorial

Term Work:

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

(Tools to be used –

JDK 1.2 onwards, TextPad / EditPlus, Eclipse 3.x, Tomcat 5.x, JBoss 4.x, Ant 1.6.x, Struts 1.2)

Practical Examination:

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive List of Experiments –

1. Design a simple class to represent Time using overloaded constructors
2. Design a program to display string array in sorted order
3. Design a class to create a package and use package in another class
4. Design a program to display digital clock in applet
5. Design a program to create logon form for user
6. Program to create a frame to enter details of student
7. Program to create free hand drawing tool using keyboard.
8. Program to create menu based application
9. Program to save student details in a database
10. Program to display student details in a frame

Title of the Subject: Database Management System

Course Code: MCA-202

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)
Practical : 2 Hrs/Week	Practical Exam: 25 Marks
	Term Work: 25 Marks

Objectives:

- To make students familiar with the fundamental concepts of database management.
- To develop the expertise in database management skills
- To give emphasis on how to organize, maintain and retrieve--efficiently, and effectively--information from a DBMS

- To use the concepts in Information System implementation.

CONTENTS

Unit 1- Introduction: (08 Hrs)
Introduction to Database Management System, Examples, Characteristics of the Database Approach, Advantage of using a Database Approach, Database System concepts and Architecture, Data Models, Schemes and Instances, DBMS Architecture and Data Independence, Database Languages and Interfaces, Database System Environment, Classification of Database Management Systems.

Unit 2- ER Models, Relational Models: (08 Hrs)
Database Modeling using the ER Model, Using High-Level conceptual Data Models for Database design, An example Database Application, Entity types, Entity Sets, Attributes and keys, Relationships, Relationship types, roles and Structural Constraints, Week Entity types, Refining the ER Design for the Company Database, ER Diagrams, naming conventions and design Issues, the Relational Data Model, Relational constraints, the Relational Algebra: Relational Model Concepts, Relational concepts and Relational Database Schemes, Update Operation and Dealing with Constraints Violations, Relational Database Design, Using ER-to-Relational Mapping.

Unit 3- Database Designing: (08 Hrs)
Functional Dependencies and Normalization for Relational Database, Informal Design Guidelines for Schemes, Functional Dependencies, Normal Forms based on Primary keys, General Definitions of Second and Third Normal forms, Boyce- Codd Normal form, Relational Database Design Algorithms and Further Dependencies, Algorithms for Relational Database Schema Design, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Inclusion Dependencies, Other Dependencies and Normal Forms.

Unit 4- SQL-The Relational Database Standard: (08 Hrs)
Data definition, Constraints and Schema changes in SQL 2, Basic Quires in SQL, More Complex SQL Quires, Insert, Delete and Update Statements in SQL, views(Virtual Tables) in SQL, Specifying general constraints as Assertion features of SQL. Integrity constrains, Triggers, Functional dependencies.

Unit 5- Transaction Processing: (08 Hrs)
Transaction Processing Concepts, Introduction to Transaction Processing, Transaction and System Concept, Desirable properties of Transactions, Scheduling and Recoverability, Serializability of Scheduling, Transaction Support in SQL, Concurrency control techniques, Concurrency techniques for concurrency control, concurrency control based on timestamp based protocol, validation based protocol, deadlock handling, Database Recovery Techniques based on Immediate Update, Failure classification, Shadow Paging, Log based recovery, failure with loss of Nonvolatile Storage.

Text Books:
1. Abraham Silberschatz and Henry Korth, Sudarshan : *Database System Concepts*, 4th Edition, ISBN : 0-07-120413-X, Tata McGraw-Hill.
2. Elmasri and Navathe : *Fundamentals of Data base Systems* (3rd Ed.), Addison-Wesley, 1999.

Term Work:
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above.
Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive list of Experiments:

1. Introduction to DBMS
2. To create table , alter table & delete table(DDL)
3. To study SELECT command
4. To insert , delete & update operations on table(DML)
5. To study different types of sub queries
6. To study referential integrity constraints
7. To study other constraints
8. To study joins
9. To study views
10. To study trigger

Title of the Subject: Operating System
Course Code: MCA 203

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)
Practical : 2 Hrs/Week	Practical Exam: 25 Marks
	Term Work: 25 Marks

Objectives:
- To provide the students complete knowledge of Operating Systems principles.
- To have a clear understanding of OS design methodologies adapted by designers

Contents:

Unit 1: (8 hrs)

Introduction: Introduction to OS, OS as extended machine, OS as resource manager, History of OS:-first to fourth generation (simple batch system, time - sharing systems, Real-time systems, parallel systems, distributed system), OS concepts (Process, Files, Shell), System calls.
Process Management:
The process model, process states, PCB (process control block), Threads
Process Synchronization:
Intercrosses communication (IPC), race condition, critical sections, mutual exclusion with busy waiting, sleep & wake-up, semaphores, event counters, monitors, message passing, classical IPC problems: Dining philosophers problem, Readers & Writers problems.

Unit 2: (8 hrs)

Process scheduling:
Round Robin scheduling, priority scheduling, multiple queues, shortest job first, policy driven scheduling, two level scheduling
Memory management:
Memory management without swapping or paging, use of multiprogramming.
Swapping**:** Multiprogramming with fixed and variable partitions, memory management with bitmaps, linked lists and buddy system.
Allocation of swap space, Virtual Memory: Paging, segmentation.

Page Replacement Algorithms: Optimal page replacement, Not-Recently used page replacement, First-in-first -out, least recently used random page replacement.

Unit 3: **(8 hrs)**

Principles of I/O Hardware: I/O devices, Device controlling.

Principle of I/O software: Goals of I/O software, Interrupt handlers, Device drivers, device - independent I/O software, user space I/O software.

Deadlocks: Resources, deadlock modeling, the Ostrich algorithm, detection & recovery, deadlock prevention, deadlock avoidance (Banker's Algorithm)

Unit 4: **(8 hrs)**

RAM disks: RAM disks H/W & S/W, overview of RAM disk driver. Disks: Disk H/W disk S/W (disk scheduling algorithms)

Terminals: Terminal H/W & S/W, Clocks H/W & clocks S/W

File System: The user view of the file system: Files, directories, File system implementation: Implementing files with Contiguous, Linked list, index and index-nodes (UNIX), disk space management, Implementing directories, file storage, Directory structures, shared files, file system reliability, consistency & performance.

Unit 5: **(8 hrs)**

Security: security environment, flaws generic security attacks, user authentication, design principles of security.

Protection Mechanism: Protection domains, access control lists, capabilities, protection models

Text Books:

1. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall
2. Andrew S. Tanenbaum, "Operating System Design & Implementation", Second edition, Pearson Education
3. Abraham Silberschatz, Peter Galvin, "Operating System Concepts", Fifth edition, Addison Wesley

Reference Books:

1. Garry Nutt, "Operating Systems A Modern perspective", Second Edition, Addison Wesley, 2000
2. Milan Milenkovic, "Operating System: Concepts & design" - TMH publication
3. William Stallings, "Operating systems", Prentice Hall, 1997
4. Deital H.M., "Operating Systems", Addison Wesley, 2001

Term Work:

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive list of experiments:

1. Simulate copy and more command
2. Simulating First-fit and Best-fit method of partitioned memory allocation

3. Simulate and performance measurement in Shortest Job First, First Come First Served and priority scheduling algorithms for processor scheduling.
4. Program illustrating deadlock detection.
5. Simulate and performance measurement in FIFO and LRU page replacement algorithm.
6. Write TSR (Terminate and Stay Resident Program) illustrating concept of DOS interrupts.
7. Implementation and illustrating process/semaphore concept using Dining philosopher or Reader- writer problem.
8. Case study: Windows NT

Title of the Subject: Software Engineering (SE)

Course Code: MCA 204

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)

Objectives:

- To train the students on basic principles of Software Engineering used in Industry.
- To learn the software engineering concepts and methodologies.

Unit 1: **(8 hrs)**

The Product & the Process:

Software-characteristics, components, & applications, Software Myths, Process Framework, Software Process, Layered Technology, Capability Maturity Model, Software Process Models, Waterfall Model, Linear Sequential Model, Prototyping Model, RAD Model, Incremental Model, Fourth Generation Techniques, The Unified Process, Software Development Life Cycle.

Software Engineering Concepts:

Essence of Practices, Communication Practices, Software Phases, Planning Phase, Modeling Phase – Analysis & Design, Construction Phase – Coding & Testing, Deployment System Engineering, System Engineering, Information Engineering, Product Engineering.

Unit 2: **(8 hrs)**

Requirement Analysis: Concepts & Principles:

Requirement Analysis, Communication Techniques, Analysis Principles, Software Prototyping, Analysis Modeling, Data Modeling, Functional Modeling, Behavioral Modeling, Structured Modeling, Data Dictionary.

Project Management Concepts:

The Management Spectrum, People, Problem, Process, Project, Software Process & Project Metrics, Software Scope, Resources, Software Project Estimation, Decomposition Techniques, Empirical Estimation Model.

Unit 3: **(8 hrs)**

Design Concepts & Methods:

Design Process & Principles, Design Concepts, Effective Modular Design, Architectural Design, Interface Design, Procedural Design, Object Oriented Design, Unified Modeling Language (UML): Basic Notations , Class diagram , State diagram activity diagrams , Use-case diagrams sequence diagrams.

Unit 4: **(8 hrs)**

Coding:

TOP-DOWN and BOTTOM-UP structure programming, information hiding, programming style, and internal documentation, verification, metrics, monitoring and control.

Software Testing Methods:

Software Testing Fundamentals, Test Case Design, White Box Testing, Black Box Testing.

Unit 5: Software Quality Assurance: (8 hrs)

Quality Concept, Quality Movement, Formal Technical Review.

Re-engineering: Business Process Engineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering

Text Books / Reference Books:

1. Pressman R., "Software Engineering, A Practitioners Approach", 6th Edition, Tata McGraw Hill Publication, 2004, ISBN 007-124083 – 7
2. K.K.Aggarwal , Yogesh Singh , "Software Engineering" , New Age International Publishers
3. Meilir Page-Jones- " Fundamentals of Object Oriented Design in UML" , Pearson Education
4. Ian Sommerville, "Software engineering", Pearson education, 6th edition.
3. Rajesh Prasad, Yogesh Sharma, Nihar Ranjan, Bhavna Tiple, "Software Engineering"

Reference Books:

1.Pankaj Jalote , "Software Engineering " , Narosa Publishing House.

2.Peters J. Pedrycz W., "Software Engineering: An Engineering Approach", John Wiley & Sons, 20007 ISBN 9971-5 1-309-9

3.Shari Lawrence Pfleeger, Joanne M Atlee , "Software Engineering", 3/e, ISBN-13: 9788131720981, Pearson

Title of the Subject: Microsoft Technologies Laboratory –I (VB.NET)

Course Code: MCA 205

Teaching Scheme:
Practical: 4 Hrs/ week

Examination Scheme:
Practical Exam: 50 Marks
Term Work: 50 Marks

Objectives:

- To provide the students, complete knowledge of VB.NET programming principles.
- To provide a proper expertise on Software development using these techniques

Contents:

Unit 1:

Introduction - .NET platform, Structure of .NET framework, Visual Studio .NET, Basics of Visual Basic.NET

Unit2:

Object Oriented Features- Classes & objects, Inheritance, Interface

Unit 3:

Windows Forms – Form Controls, Mouse and Keyboard events, File stream and Text IO operations

Unit 4:

Database Handling – ADO.NET, Table, Adapter, Data Set, Sql operations, Data Binding

Unit 5:

Error Handling, Security in.Net Framework, Assemblies & Deployment

Reference Books:

1. "Professional VB.NET", WROX Publication
2. VB.NET, Black Book

Term Work:

The term work shall consist of **The term work shall consist of at least** 5 **experiments based on the syllabus above and a mini project.**

Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

- Continuous lab assessment
- Actually performing practicals in the laboratory during the semester
- Mini project developed by the student

Practical Examination:

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record and the **mini project**. Duration of examination is three hours.

Mini Project (Compulsory):

Guidelines for Mini Project:

- Allow **minimum 2 to maximum 4** students per mini project group
- Take the topic from students in **first 15 days** from the start of the semester.
- Follow Software Development Life Cycle Phase for mini project development.

Mini Project shall follow the steps below:

1. Define the problem with specifications
2. Define the functionality of the project
3. Design a solution for the project
4. Implement the solution.
   (Also Keep a record of total number of man hours spent for the mini project.)
5. Present and evaluate the project.

The report of this Mini project is to be submitted in typed form with Spiral Binding. The report should have all the necessary diagrams, charts, printouts and source code. The work has to be done in groups.

The **suggestive format** of the report is as follows:
(Only one report should be submitted per group as a part of term work submission.)

Title of the Mini Project:
Names & Roll Nos of the students:
Name of the guide:
Chapter 1: Introduction
Chapter 2: Requirement specifications
Chapter 3: Design and implementation
(This chapter will include the entire design process with necessary DFDs, other diagrams, design methodologies and other design and implementation details.)
Chapter 4: Performance Analysis
(This chapter will include Testing and evaluation process. It should also mention about the method of testing used. It will include test case analysis with results. It should also indicate how better the designed system performs with tabular results.)
Chapter 5: Conclusions (This should include conclusion & future scope)

Title of the Subject: **Design and Analysis of Algorithms (DAA)**

Course Code: MCA 206

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)
Practical : 2 Hrs/Week	Practical Exam: 25 Marks
	Term Work: 25 Marks

Objectives:

- To study different methods to devise an algorithm
- To use computational complexity to analyze algorithms

Contents:

Unit 1: **(8 Hrs)**

Introduction and a brief review of Elementary Data Structures

Definition of an Algorithm, Algorithm specification, Performance analysis: -Space and time complexity, Asymptotic Notation, Practical Complexities, Performance Measurement, heap and heap sort, sets and disjoint set, Union, graphs, hashing.

Unit 2: **(8 Hrs)**

Divide and Conquer -

General method of Divide and Conquer, Binary search, finding the maximum and minimum, merge sort, quick sort, Selection, Strassen's Matrix Multiplication.

Unit 3: **(8 Hrs)**

The Greedy Method: -

General method, Knapsack Problem, Tree vertex splitting, Job sequencing with deadlines, Minimum cost spanning trees, optimal storage on tape, optimal merge Patterns, Single sources shortest paths.

Unit 4: **(8 Hrs)**

Basic Search and Traversal Techniques -

The techniques for binary trees, Techniques for graphs, connected components and spanning trees, Biconnected Components and DFS

Unit 5: **(8 Hrs)**

Backtracking and Branch and Bound Technique -

The general method of backtracking, The 8- queens problem, sum of subsets, Graph coloring, Hamiltonian cycles, Knapsack problem using backtracking.

The method of branch and bound, 0/1 knapsack problem, Traveling sales person problem using branch and bound.

Text Books/Reference Books:

1. E. Horowitz and S. Sahni, "Fundamentals of Computer Algorithms", Galgotia Pub
2. Aho, Hopcroft, Ulman, "The Design and Analysis of Computer Algorithms", Addison Wesley

Term Work:

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above.
Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Title of the Subject: Computer Networks
Course Code: MCA 207

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)

Objectives:
- To train the students on basic principles of Computer Networks.
- To learn the Networking concepts and methodologies.

Contents-

Unit 1- Introduction: **(8 Hrs)**
Overview of computer networks, Network hardware and software, Switches, routers, Reference model-OSI and TCP/IP and their comparison, Network layer – Network layer design issues, Various Routing algorithms and congestion control algorithms, Internetworking, The networking layer in the internet and in ATM network.

Unit 2- Transport Layer: **(8 Hrs)**
The Transport Service, Elements of Transport Protocols, Internet Transport Protocols, TCP and UDP, ATM AAL layer protocols, Performance issues.

Unit 3- TCP/IP : **(8 Hrs)**
The TCP/IP architecture, The Internet Protocols, Ipv6, User gram Protocol, DHCP and mobile IP, Internet protocols, Multi cast routing.

Unit 4- The Application Layer: **(8 Hrs)**
Network security – Principles of cryptography, Secret-key and Public-key algorithms, Authentication protocols, Digital scanners, Domain Name System –The DNS name space, Resource records, Name Servers, Simple Network Management Protocol – the SNMP model, Abstract syntax notation, Structure of management information, Managements information base, The SNMP protocol, Electronic mail- Architecture and services, The user agent, Message formants and message transfer, Email privacy, Usenet news, User view of Usenet Implementation.

Unit 5- Multimedia Information and Networking: **(8 Hrs)**
Digital Representation of Analog Signals, Techniques for increasing compression, The Real-Time Transport Protocol, Session control protocols.

Text Books/Reference Books :

1. Andrew S Tanenbaum**, "**Computer Networks"**,** Third Edition, Prentice HI
2. Forozon , "Data Communication and Networking" , Tata McGraw Hill
3. William Stallings, "Local and Metropolitan Area Networks", 6/e, Pearson, ISBN-10: 8131720217

Title of the Subject: Linux Operating System
Course Code: MCA 208

Teaching Scheme:
Lectures: 4 Hrs/Week
Practical: 2 Hrs/Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Practical Exam: 25 Marks
Term Work: 25 Marks

Objectives –
- To train the students on basic principles of Linux Operating System.

Contents -

Unit 1: Introduction (8 hrs)
History of Linux, Flavors of Linux, Architecture of Linux Operating System, Linux Vs Classic Unix operating system, obtaining the kernel source, installing kernel source, kernel source tree

Unit 2: Process Management (8 hrs)
The process Descriptor and task structure, Process state, Process creation, Process termination, Policy, Process scheduling algorithms

Unit 3: File and Memory Management (8 hrs)
Buffer Cache – Buffer Header , Structure of Buffer pool, Scenarios for retrieval of buffer, reading and writing disk blocks, advantages and disadvantages of buffer cache
Memory Management – pages, zones, kmalloc(), kfree()
Internal Representation of Files – inodes, structure of regular files, directories, conversion of pathname to an inode, superblock, inode assignment to new file

Unit 4:Commands and Utilities (8 hrs)

User login and session management commands, file system navigation and file management commands, communication commands, commands for working with text files, grep, awk, vi editor, File management system calls like read(), write(), open(), close(), create()

Unit 5: Shell Scripts and Configuration (8 hrs)
Writing simple shell scripts, command line arguments, logical operators, using if then else, case, for loop, while and until loop, Role of system administrator, configuring - Apache, DNS, Samba servers

Text Books/ Reference Books:

1.M.Becket.al: "Linux Kernel Programming", 3rd Edition Pearson Educations.
2.Robert love: "Linux Kernel Development", Pearson Education
3.Sumitabha Das: "Unix concepts & applications", TMH

Term Work:
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.
* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Title of the Subject: Data Warehousing and Data Mining
Course Code: MCA 209

Teaching Scheme:
Lectures: 4 Hrs/Week
Practical : 2 Hrs/Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Practical Exam: 25 Marks
Term Work: 25 Marks

Objectives:
- To familiarize with the fundamental concepts of Data warehousing and OLAP
- To develop the concepts of data mining methods in database management skills
- To be able to efficiently design and manage data storages using data warehousing, OLAP, and data mining techniques,
- To use the concepts in Text mining, web mining and Knowledge Discovery

Unit 1- Introduction to Data Warehousing: (8 hrs)
Introduction to Decision Support System: DSS Defined, History of DSS, Ingredients of DSS, Data and Model Management, DSS Knowledge base, User Interfaces, The DSS Users, Categories and Classes of DSSs Need for data warehousing, Operational & informational data, Data Warehouse definition and characteristics, Operational Data Stores.

Unit 2- Data warehouse Components (8 hrs)
Architectural components, Data Preprocessing: Why Preprocess Data? Data Cleaning Techniques, Data Integration and Transformation, Data Reduction Techniques, Discretization and Concept Hierarchy Generation for numeric and categorical data, Significant role of metadata , Building a Data warehouse, Benefits of Data Warehousing.

Unit 3- OLAP in the Data Warehouse (8 hrs)
A Multidimensional Data Model, Schemas for Multidimensional Databases: Stars, Snowflakes, Star join and Fact Constellations Measures, Concept Hierarchies, OLAP Operations in the Multidimensional Data Model, Need for OLAP, OLAP tools , Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web.

Unit 4- Data Mining Algorithms (8 hrs)
Concept Description: What is Concept Description? Data Generalization and Summarization-Based Characterization, Mining Descriptive Statistical Measures in Large Databases. Mining Association Rules: Association Rule Mining, Market Basket Analysis, Association Rule classification, The Apriori Algorithm, Mining Multilevel Association Rules, Constraint-Based Association Mining, Sequential mining.
Classification and Prediction: What is Classification and Prediction? Data Classification Process, Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification,

Unit 5- Classification, Knowledge Discovery (8 hrs)
Classification Based on Association Rule Mining, Other Classification Methods Cluster Analysis: What is Cluster Analysis? Types of Data in Cluster Analysis, A Categorization of Clustering Methods.
Introduction to **Knowledge Discovery**, innovative techniques for knowledge discovery, application of those techniques to practical tasks in areas such as fraud detection, scientific data analysis, and web mining, Introduction to huge data sets such as Web, telecommunications networks, relational databases, object-oriented databases, and other sources of structured and semi-structured data, Problem of Large Data sets

Text/Reference Books –

1. Paul Punnian, “Data Warehousing Fundamentals”, John Wiley Pub
2. Han, Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann .
3. Alex Berson, S.J. Smith, “Data Warehousing, Data Mining and OLAP”, Tata McGraw Hill
4. Margaret Dunham, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Pub.
5. Ralph Kimball, "The Data Warehouse Lifecycle toolkit', John Wiley.
6. Jiawei Han, Micheline Kamber, “Data Mining : Concepts and Techniques”, 2nd edition, Morgan Kaufmann, ISBN 1558609016, 2006.
7. A B M Shaukat Ali, Saleh A Wasimi, “Data Mining: Methods and Techniques”, Cengage Learning Pub.
8. Ian Witten and Eibe Frank, Data Mining, “Practical Machine Learning Tools and Techniques with Java Implementations”, Morgan Kaufman, ISBN 1558605525, 1999,

Term Work:
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive List of experiments:

1. Evolution of data management technologies, introduction to data warehousing concepts
2. Develop an application to implement defining subject areas, design of fact and dimension tables, data marts.
3. Develop an application to implement OLAP, roll-up, drill-down, slice, and dice operations.
4. Develop an application to construct a multidimensional data
5. Develop an application to implement data generalization and summarization techniques
6. Develop an application to extract association mining rules.
7. Develop an application for classification of data.
8. Develop an application for implementing one of the clustering technique
9. Develop an application for implementing Naïve Bayes classifier
10. Develop an application for Decision tree classifier

Title of the Subject: Microsoft Technologies Laboratory –II (ASP.NET)

Course Code: MCA 210

Teaching Scheme:
Practical: 4 Hrs/ week

Examination Scheme:
Practical Exam: 50 Marks
Term Work: 50 Marks

Objectives:

- To Study website development using GUI environment.
- To develop programming skills with ASP.NET

Contents:

Unit 1: Introduction
Internet terminology, Web Server, Browser, Client Vs Server Side Scripting
Introduction to Java Script (Client Side Script) – Variables, Document Object Model, Functions, Event Handling.

Introduction to .NET framework, ASP.NET namespace hierarchy, Page life cycle, view state, postback, Ispostback property, HTML and Web Controls

Unit 2: Web Controls
Text Box, Label, Button, Link Button, Hyperlink Button, Image Button, List Box, Drop DownList, CheckBox, Radio Button, CheckBoxList, RadioButtonList, Panel

Unit 3: Validation Controls & Rich Controls
RequiredFieldValidator, RangeValidator, CompareValidator, RegularExpressionValidator, CustomValidator and ValidationSummary, Rich Controls – Calendar Control, AdRotator Control

Unit 4: ADO.NET
Overview of ADO.NET, Advantages of ADO.NET, Connected and disconnected data access, Connection, Command, DataReader, DataAdapter, DataSet, DataTables DataGrid Control, DataList Control and Repeater Control

Unit 5: Passing Data between Pages & Web Services Cache, Session, Context, QueryString, Post, Global.asax , Introduction to web services

Reference Books:
1. ASP.NET: Stephen Walther - Unleashed.

2. Asp. Net: The Complete Reference: TATA Mc GRAW HILL

Term Work:
The term work shall consist of **The term work shall consist of at least** 5 **experiments based on the syllabus above and a mini project.**

Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

- Continuous lab assessment
- Actually performing practicals in the laboratory during the semester
- Mini project developed by the student

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record and the **mini project**. Duration of examination is three hours.

Mini Project (Compulsory):

Guidelines for Mini Project:

- Allow **minimum 2 to maximum 4** students per mini project group
- Take the topic from students in **first 15 days** from the start of the semester.
- Follow Software Development Life Cycle Phase for mini project development.

Mini Project shall follow the steps below:

1. Define the problem with specifications
2. Define the functionality of the project
3. Design a solution for the project
4. Implement the solution.
   (Also Keep a record of total number of man hours spent for the mini project.)
5. Present and evaluate the project.

The report of this Mini project is to be submitted in typed form with Spiral Binding. The report should have all the necessary diagrams, charts, printouts and source code. The work has to be done in groups.

The **suggestive format** of the report is as follows:
(Only one report should be submitted per group as a part of term work submission.)

Title of the Mini Project:
Names & Roll Nos of the students:
Name of the guide:
Chapter 1: Introduction
Chapter 2: Requirement specifications
Chapter 3: Design and implementation
(This chapter will include the entire design process with necessary DFDs, other diagrams, design methodologies and other design and implementation details.)
Chapter 4: Performance Analysis
(This chapter will include Testing and evaluation process. It should also mention about the method of testing used. It will include test case analysis with results. It should also indicate how better the designed system performs with tabular results.)
Chapter 5: Conclusions
(This should include conclusion & future scope)

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Faculty of Engineering & Technology

Board of Studies in Computer Science & Engineering

Proposed Curriculum structure of Third Year M.C.A.

w.e.f. July 2009

Part – I

Sr. No.	Subject Code	Subjects	Teaching Scheme [Hours/Week]		Examination Scheme [Marks]			
			Lecture	Pract.	Theory	TW	Pract.	Total
01	MCA 301	Software Testing	4	2	100	25	25	150
02	MCA 302	Professional Ethics and Cyber Security	4	2	100	25	25	150
03	MCA 303	Business Processes	4	--	100	--	--	100
04	MCA 304	Elective	4	2	100	25	25	150
05	MCA 305	Open Source Software Development Lab	--	4	--	50	50	100
06	MCA 306	Seminar	--	2	--	50	--	50
Total of I			**16**	**12**	**400**	**175**	**125**	**700**

Part – II

Sr. No.	Subject Code	Subjects	Teaching Scheme [Hours/Week]		Examination Scheme [Marks]			
			Lecture	Pract	Theory	TW	Pract	Total
01	MCA 307	Dissertation	--	8	--	50	150	200
		Total of II		08	00	50	150	200
Total of I and II					**400**	**225**	**275**	**900**

Elective: 1. Mobile Computing 2. Multimedia Systems

Title of the Subject: Software Testing
Course Code: MCA 301

Teaching Scheme:
Lectures: 4 Hrs/Week
Practical : 2 Hrs/Week

Examination Scheme:
Theory Paper: 100 Marks (3 Hrs)
Practical Exam: 25 Marks
Term Work: 25 Marks

Objectives:

-To identify correctness, completeness and quality of developed Software.
-To train student to create good test case is one that has a high probability of finding an as yet undiscovered error.

CONTENTS

Unit 1- Introduction to Basic of software testing & Terminology: (8 hrs)
Quality Concepts, Quality Assurance, Quality Control, What is testing?, Why is testing necessary?, Objective of testing?, Software Development & Software Testing Life Cycle, Testing Standards:-IEEE,CMM,ANSI,Object – oriented testing, Web testing, GUI testing

Unit 2- Levels Of Testing: (8 hrs)
Verification and Validation Model, Techniques of Verification:-Peer Review, Walkthrough, Inspection.Unit testing, Integration testing, Function Testing
System testing**:-**Installation Testing, Usability Testing, Regression testing,
Performance testing**:-**Load Testing**,** Stress Testing**.** Security testing**,** Volume testing
Acceptance testing**:-**Alpha testing, Beta testing, Gamma testing.

Unit 3- Testing methods and Testing tools: (8 hrs)
Black Box methods**:-**Equivalence partitioning**,** Boundary-value analysis**,** Error guessing.
White Box methods**:-**Statement coverage**,** Decision coverage**,** Condition coverage.
Testing Tools:-Win Runner, Load Runner.

Unit 4- Test Planning & Documentation: (8 hrs)
Testing Strategy**:-**type of project, type of software**.** Test Plans, Test Case, Test Data, Risk Analysis.

Unit 5- Defect Management and Test Reporting: (8 hrs)
Defect analysis, Defect Reporting, Tracking Workflow, Test reporting,Defect rates and schedules .

Reference Books:

1. Dr.K.V.K.K. Prasad, "*Software testing tools*", Dreamtech Publications
2. Rex Black , "*Software testing*", Wrox Publications
3. Roger Pressman, " *Software Engineering- a practitioners approach*", McGraw Hill
4. Boris Bezier, "*Software testing techniques*", Dreamtech Publications
5. Ron Pattorn, "*Software testing* ", Tech Publications
6. Cem Kener , "*Testing Computer Software*", Van Nostrand Publications

Reference Website:
1. www.onestoptesting.com
2. www.wikipedia.org

Term Work:
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive List of Experiments:

1. Study of Testing tools
2. Introduction to Win runner
3. Recording test in analog and context sensitive mode
4. Synchronizing test
5. Checking GUI Objects
6. Checking Bitmap Objects
7. Programming test with TSL
8. Creating data driven test
9. Maintaining test script
10. Project (Creating test report)

Title of the Subject: Professional Ethics and Cyber Security

Course Code: MCA 302

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)
Practical : 2 Hrs/Week	Practical Exam: 25 Marks
	Term Work: 25 Marks

Objectives:

- To make students familiar with the fundamental concepts of computer ethics
- To know the linkage between computer, professional , philosophical ethics and decision making
- To develop the concepts in computer forensics
- To give emphasis on how cyber security operations are carried out
- To introduce the linkage between technology, law and ethics

CONTENTS

Unit 1- Computer ethics and philosophical ethics: (08 Hrs)
Vacuum of policies, conceptual muddles, social context, moral and legal issues, uniqueness of ethical issues, role of analogy, descriptive and normative claims, ethical relativism, utilitarianism, other theories

Professional Ethics:

Characteristics, the system of professions, computing as a profession, professional relationships, responsibilities, code of ethics and professional conduct

Privacy: Computers and privacy issue, reframing this issue, legislative background, better privacy protection

Unit- 2 **(08 Hrs)**

Intellectual property issues in cyberspace:

Introduction to intellectual property Protections via Copyright, Trade Secrets, Trademarks, Patents, Contracting to protect intellectual property, Protection options – Encryption, copyright on web-content, copyright on software

Ethical Decision Making: **(08 Hrs)**

Types of ethical choices, Making defensible decisions, Ethical dilemmas, law and ethics, Guidelines for dilemma (Informal and Formal), Four-step analysis process of solving dilemma

Case studies: i) A stolen password ii) Recovery of data leads to Discovery of confidential files iii) Do copyright ethics change overseas?

Unit 3- Crime incident Handling Basics: **(08 Hrs)**

Hacking, cyber activism, Tracking hackers, clues to cyber crime, privacy act, search warrants, common terms, organizational roles, procedure for responding to incidents, reporting procedures, legal considerations

Information Technology Act 2000

Scope, jurisdiction, offense and contraventions, powers of police, adjudication

Unit 4- Cyber Forensics: **(08 Hrs)**

Cyber forensics, cyber crime examples, forensics casework, investigative incident-response actions, computer forensics tools, Threats in cyberspaces, Blended attacks

Sample Policy Documents: i) Antivirus Guidelines Policy ii) Internal Lab Security Policy iii) Server Security Policy iv) Wireless Communications Policy

Unit 5- **(08 Hrs)**

Information Security Certifications, CISSP and SSCP, CISA and CISM, SCP, GIAC, certification weaknesses, Role of these certified professionals, Windows Server 2003 Security Fundamentals

Text/ Reference Books:

1. Deborah G Johnson, " *Computer Ethics*", Pearson Education Pub., ISBN : 81-7758-593-2.
2. Earnest A. Kallman, J.P Grillo, "*Ethical Decision making and IT: An Introduction with Cases",* McGraw Hill Pub.
3. John W. Rittinghouse, William M. Hancock, "*Cyber security Operations Handbook*", Elsevier Pub.
4. Michael E. Whitman, Herbert J. Mattord, "*Principles of Information Security",* 2nd Edition,, CengageLearning Pub.
5. Randy Weaver, Dawn Weaver, "*Network Infrastructure Security*", Cengage Learning Pub.

Term Work:

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Title of the Subject: Business Processes
Course Code: MCA 303

Teaching Scheme:
Lectures: 4hrs/week

Examination Scheme:
Theory Paper: 100 Marks (03 hrs)

Objectives:
- To study concepts of Business Process
- To enable students to understand various types of processes involved in Business
- To know the linkage between the technology and the actual processes used in Business

CONTENTS

Unit-1 **(8 hrs)**

Business Process: Overview, History – Adam Smith and Other definitions. Supporting Theories and Concepts - Division of Labor, Span of Control, Departmentalization by Process and Purpose, Information Management Concepts
Business Architecture: Overview, Business Architecture Topics – Different view of an organization, Disciplined Approach, Business Strategy. Frameworks for Business Architecture – Zachman Framework, The Object Management Group, The Open Group, eXtended Business Modeling Language, Industry Reference Models

Unit- 2: **(8 hrs)**

Business Process Management: Overview, BPM Life-cycle - Design, Modeling, Execution, Monitoring, Optimization. Practice - BPM Technology. Use of Software

Business Process Automation: Delivery – Extension of Existing IT Systems, Purchase of a Specialist BPA tool, Purchase of a Business Process Management Solution with BPA Extensions, Purchase of a Middleware Solution. BPA vs BPM, The Role of Service-Oriented Architecture (SOA) with respect to BPA

Unit -3: **(8 hrs)**

Business Process Reengineering: Basic Concepts, Need for BPR, Principles of BPR, Role of IT, BPR and restructuring the organization

Business Process Mapping: Early History, Recent Developments

Unit -4: **(8 hrs)**

Business Process Execution: Overview, History, Business Process Execution Language Topics – BPEL Design Goals, The BPEL Languages, Relationship of BPEL to BPMN, Adding 'Programming in the Small' Support to BPEL, WS- BPEL

Business Process Outsourcing (BPO): Benefits and limitations of outsourcing the processes, offshore and nearshore outsourcing, industry size, risks involved

Unit -5: **(8 hrs)**

Business Management Strategy- Six Sigma: Historical Overview, Origin and Meaning of the Term "Six Sigma Process", Role of the 1.5 Sigma Shift, Sigma Levels. Methods- DMAIC, DMADV. Implementation Roles, Quality Management Tools and Methodologies used in Six

Sigma, Software used for Six Sigma, List of Six Sigma Companies, Reception – Lack of Originality, Role of Consultants, Potential Negative Effects, Based on Arbitrary Standards, Criticism of the 1.5 Sigma Shift.

Text/ Reference Books:

1. R. Radhakrishnan and S. Balasubramanian, *"Business Process Reengineering: Text cases",* PHI Pub.
2. Vikram Sethi, Wiiliam R King, *"Organizational Transformation Through Business Process Reengineering",* Pearson Education Pub.

Website: www.wikipedia.org (Wikipedia, The Free Encyclopedia)

Title of the Subject: (i) Mobile Computing (Elective I)
Course Code: MCA 304

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)
Practical : 2 Hrs/Week	Practical Exam: 25 Marks
	Term Work: 25 Marks

Objectives:

1. To make students familiarize with Wireless Networking.
2. To know the basics of WAP and WML
3. To familiarize students with open source tools for Mobile Applications

Unit 1 **(8 hrs)**

Introduction

Principle of Cellular Communication, Overview of 1G, 2G, 2.5G and 3G and 4G technologies. Applications - Vehicles , Emergencies , Business , Replacement of wired networks ,Infotainment and more ,Location dependent services , Mobile and wireless devices. Mobile OS

Wireless transmission

Frequencies for radio transmission, Regulations Signals ,Antennas , Signal propagation -Path loss of radio signals, Additional signal propagation effects , Multipath propagation. Multiplexing -Space division multiplexing , Frequency division multiplexing , Time division multiplexing , Code division multiplexing. Modulation -Amplitude shift keying , Frequency shift keying , Phase shift keying , Advanced frequency shift keying , Advanced phase shift keying , Multicarrier modulation , Spread spectrum -Direct sequence spread spectrum , Frequency hopping spread spectrum ,Cellular systems

Unit 2 **(8 hrs)**

Medium access control

Motivation for a specialized MAC - Hidden and exposed terminals , Near and far terminals SDMA , FDMA , TDMA - Fixed TDM , Classical Aloha , Slotted Aloha , Carrier sense multiple access , Demand assigned multiple access , PRMA packet reservation multiple access ,Reservation TDMA

Multiple access with collision avoidance , Polling , Inhibit sense multiple access , CDMA - Spread Aloha multiple access , Comparison of S/T/F/CDMA

Telecommunication systems

GSM - Mobile services , System architecture , Radio interface Protocols , Localization and calling , Handover , Security , New data services ,Cellular Digital Packet Data,VOIP, GPRS Services, Wireless Local Loop-WLL system Bluetooth Technology

Unit 3 **(8 hrs)**

Wireless LAN

Infrared vs. radio transmission , Infrastructure and ad hoc networks
IEEE 802.11 - System architecture, Protocol architecture , Physical layer , Medium access control layer , MAC management , Future development

Mobile network layer

Mobile IP - Goals, assumptions, and requirements, Entities and terminology, IP packet delivery , Agent advertisement and discovery , Registration , Tunnelling and encapsulation, Optimizations, Reverse tunnelling, IPv6 ,Dynamic host configuration protocol ,Ad hoc networks -
Routing , Destination sequence distance vector ,Dynamic source routing , Hierarchical algorithms , Alternative metrics

Unit 4 **(8 hrs)**

Mobile transport layer

Traditional TCP - Congestion control , Slow start , Fast retransmit/fast recovery, Implications on mobility. Indirect TCP, Snooping TCP , Mobile TCP , Fast retransmit/fast recovery ,Transmission/time-out freezing , Selective retransmission , Transaction oriented TCP

Wireless ATM

Motivation for WATM , Wireless ATM working group , WATM services , Reference model - Example configurations , Generic reference model, Functions

Wireless application protocol

Architecture - Wireless datagram protocol , Wireless transport layer security , Wireless transaction protocol , Wireless session protocol , Wireless application environment

Unit 5 **(8 hrs)**

Wireless Markup Language
An Introduction to Wireless Technologies, Markup Languages , An Introduction to XML, Fundamentals of WML., Writing and Formatting Text , Navigating Between Cards and Decks, Displaying Images, Tables, Using Variables, Acquiring User Input

Wireless Markup Language Script

An Introduction to WMLScript, WMLScript Control Structures, Events, Phone.com Extensions, Usability

Application of Mobile computing:

ASP and Dynamic WAP Sites, XML and XSLT, Dynamic WML Generation with ASP and XSLT, Developing WAP Applications using Emulators.

Text/Reference Books:

1. Jochen Schiller, Mobile Communication, Pearson Education Asia
2 Yi Bing Lin, “Wireless and Mobile Networks Architecture”, John Wiley.
3. Wrox “The Beginning WML and WML Script”, Wrox Publication
4. Asha Mehrotra, GSM System Engg. ,Artech House

Term Work:

The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive List of Experiments –

1. WAP and WML

2. Programs Wireless Markup Language
3. Writing and formatting of text in WML
4. Navigation between cards and deck
5. Displaying of Image using WML
6. Table properties of WML
7. Methods of acquiring user inputs in WML
8. WML scripts basics
9. If – else structure of WML script
10. Assignment on latest Open Source Operating Systems for Mobile

Title of the Subject: (ii) Multimedia Systems (Elective I)
Course Code: MCA 304

Teaching Scheme:	**Examination Scheme:**
Lectures: 4 Hrs/Week	Theory Paper: 100 Marks (3 Hrs)
Practical : 2 Hrs/Week	Practical Exam: 25 Marks
	Term Work: 25 Marks

Objectives:
- To introduce to the students the characteristics and design methodologies of Multimedia
- To focus on content creation for the web and multimedia
- To expose students to theoretical and fundamental concepts of multimedia, its applications and the techniques involved.
- To help students learn the issues involved in capturing, processing, manipulating, storing, and retrieving various kinds of continuous media.

Unit 1 **(8 hrs)**

Evolution of Multimedia and its objects, Multimedia System Architecture , Scope of multimedia in business & work, Production and planning of Multimedia applications. Multimedia hardware, Memory & Storage Devices, Communication Devices, Multimedia Software,

Unit 2 **(8 hrs)**

Types of Compression, Binary Image Compression Schemes, Color, Gray Scale and Still-Video Image Compression, Lossy graphic compression , Video Image Compression, Rich-Text Format, Resource Interchange File Format, MIDI Files Format, JPEG DIB File, Format and Motion Image, MPEG Standards.

Unit 3 **(8 hrs)**

Macromedia products, Basic drawing techniques, Advance animation techniques, Creating multi layer combining interactivity and multiple scenes, Creating transparency effects using text in Flash, Flash animation.

Unit 4 **(8 hrs)**

Digital Audio Concepts, Sampling variables, Loss Less compression of sound, Lossy compression & Silence compression.

Unit 5 **(8 hrs)**

Multimedia Input and Output Devices, Pen Input, Video and Image Display Systems, Print Output Technologies, Image Scanners, Digital Voice and Video, Video Images and Animation, Full-Motion Video.

Text/Reference Books:

1. Prabhat K. Andleigh, Kiran Thakur, “Multimedia System Design”, PHI.
2. Buford, “Multimedia Systems”, Addison Wesley.

3. Agarwal and Tiwari, "Multimedia Systems", Excel.
4. Sleinreitz, "Multimedia Systems", Addison Wesley
5. Andreas Halzinger, "Multimedia Basics", Vol-I to Vol-III, Firewall Media, New Delhi.

Term Work:
The term work shall consist of at least 10 experiments/ assignments based on the syllabus above. Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive List of Experiments:

1. Image Editing using Image Processing Software- Photobie, Photoshop, CorelDraw
2. Creating a Multimedia Slide Show (Presentation) using Flash Slide Show Maker or alike
3. Audio Editing using Audio Processing Software- CoolEdit, SoundForge XP
4. Video Editing Using Video Processing Software- Adobe Premiere, Windows Movie Maker
5. Animation Creation using- Photobie-GIF Animator, Alice, Macromedia Flash, 3D Studio, MAX, Maya
6. Creating a Theme Movie: Audio-Video Mixing, Music, Narration, Video Effects, Video Transitions, Credits, Titles, etc.
7. For Example: Preparing Documentary, Advertisement, Awareness Program, Presentation CDs, etc.

Title of the Subject: Open Source Software Development Lab

Course Code: MCA 305

Teaching Scheme:
Practical: 2 Hrs/ week

Examination Scheme:
Practical Exam: 50 Marks
Term Work: 50 Marks

Term Work:
The term work shall consist of at least 10 experiments/ assignments based on the syllabus given below.

Implementation, installation and configuration tasks for Linux OS, installation of Apache, PHP and MySql, Programs in C / C++ /Java / Perl /Python.

Assessment of term work should be done which will consider the points below and the marks should be awarded accordingly.

* Continuous lab assessment
* Actually performing practicals in the laboratory during the semester

Practical Examination:
The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Suggestive List of Experiments:

1. Installation of Linux
2. Use of various commands
3. Use of Text Processing Tools : grep, cut,
4. User and Group Creation
5. Back up using tar
6. Installation using RPM
7. C/C++ program using cc / gcc
8. Configuring Apache
9. PHP script for sorting the marks
10. PHP scripts for other tasks
11. MySQL Installation , Configuration and Testing
12. Design of admission form using PHP – MYSQL

Title of the Subject: Seminar

Course Code: MCA 306

Teaching Scheme:
Practical: 2 hrs /week

Examination Scheme:
Term Work: 50 Marks

- Seminar is to be independently delivered by each candidate.
- The topic selected should be associated with current trends in Computer field.
- A report is to be submitted before the presentation. There should be unified format for the report which is to be given by the department. Presentation must be done using PPTs.
- The seminar presentation and the report is to be evaluated by two examiners of the Department.

Title of the Subject: Dissertation

Course Code: MCA 307

Teaching Scheme:
Practical: 8 hrs/week

Examination Scheme:
Practical Exam: 150 Marks
Term Work: 50 Marks

The candidate should complete the project work individually. The project can be done within the institute or it can be sponsored and performed in an industry The performance Analysis chapter should consist of various testing methods used along with sample test cases. It should also include how better the system is performing as compared to other similar systems.

1. The guide should be internal examiner for oral examination.
2. The external examiner should be from the related area of the concerned project. He should have minimum of five years of experience at degree level / industry.
3. The evaluations at final oral examination should be done jointly by the internal and external examiner.

The final examination will consist of the demonstration of work which will be judged by two examiners (one internal and one external) and the marks will be given accordingly.

The **suggestive format** of the report is as follows:
(Only one report should be submitted per group as a part of term work submission.)

Title of the Project:

Names & Roll No. of the student:

Name of the guide:

Chapter 1: Introduction

Chapter 2: Literature Survey

Chapter 3: System Development

(This chapter will include the entire design process with necessary DFDs, other diagrams, design methodologies and other design and implementation details.)

Chapter 4: Performance Analysis

Chapter 5: Conclusions

(Detailed format of the project report is to be made available by the Dept.)

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