As per NEP 2020
Master of Computer Applications
(MCA)
(Effective from Academic Year 2024-2025 onwards)

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Final Credit Summary
PG in MCA

Yr	Sem	Credits							Total
		DSC	DSE/ P/D	GEC	AEC	SEC	VAC	Seminar / Internship / Dissertation	
First	Pawas	24	4	---	---	---	2	---	30
	Vasant	24	4	---	---	---	2	---	30
Second	Pawas	--	-	---	---	---	-	---	--
	Vasant	--	--	---	---	---		---	--
		--	--	---	---	---	---	-	--
		--	--	---	---	---	--	---	--

Proposed Distribution of Credits for PG Programme				
Courses	SEM I	SEM II	SEM III	SEM IV
Major DSC	DSC1(3) DSC2(3) DSC3(3) DSC4(3) DSC5(3) DSC6(3)	DSC7(3) DSC8(3) DSC9(3) DSC10(3) DSC11(3) DSC12(3)	-	-
DSE	DSE1(4)	DSE2(4)	-	-
GEC	---	---	---	---
AEC	---	---	---	---
SEC	---	---	---	---
VAC	VAC1(2)	VAC2(2)	---	---
Seminar / Internship / Dissertation	---	---	---	-
	30	30		
Total	60		-	
		-		

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Curriculum Structure
Session 2024-2025 onwards

Name of the Programme: MCA

Year: First

	Course Code	Course Title	Contact Hrs per Week			Credits	Weightage (%)		
			L	T	P		CW$	MTE	ETE
Pawas Semester I	**Discipline Specific Core(DSC):**								
	24MCA9101T	Data Structures	3	0	0	3	10	20	70
	24MCA9102T	Database Management System	3	0	0	3	10	20	70
	24MCA9103T	Web Development	3	0	0	3	10	20	70
	24MCA9104T	Oprating System	3	0	0	3	10	20	70
	24MCA9105T	Basic Maths	3	0	0	3	10	20	70
	24MCA9101P	Data Structure Lab	0		6	3	10	20	70
	24MCA9102P	DBMS Lab	0		6	3	10	20	70
	24MCA9103P	Web Development Lab	0		6	3	10	20	100
	Discipline Specific Elective(DSE):								
	24MCA9106T	MIS & E-Commerce	4	0	0	4	10	20	70
		OR							
	24MCA9107T	Software Engineering	4	0	0	4	10	20	70
		OR							
	Value Added Course (VAC):								
	Seminar/Intership/Dissertation (S/I/D):		2	0	0	2	10	20	70
	--	--	--	--	--	--	--	--	--
		Total				22			

Summary: I Semester

S.N.	Particulars	Credits
1.	Discipline Specific Core(DSC):	24
2.	Discipline Specific Elective(DSE):	04
3.	Value Added Course(VAC):	02
4.	Seminar/Intership/Dissertation(S/I/D):	--
	Total	30

$CW (Class work): It would include attendance, assignments, class test/ quiz test/ assignements, ppt, play, learn by fun activities etc.

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Course Code   : 24MCA9101T
Title of the Course   : Data Structures
Credit of the Course : 3
Type of the Course   : DSC Course for MCA in computer science
Paper   : I

Objectives of the Course:
1. To provide the knowledge of basic data structures
2. To provide Know the strength and weakness of different data structures
3. To understand concepts about searching and sorting
4. To assess how the choice of data structures and algorithm design methods impacts the performance of programs.

Learning Outcomes:
1. To provide the knowledge of basic data structures and their implementations.
2. To understand the importance of data structures in the context of writing efficient programs.
3. To develop skills to apply appropriate data structures in problem solving.
4. To understand standard application of different basic data structures

UNIT I

Data Type - Data Object - Data Structure: Data abstraction and abstract data type; Notion of an algorithm - Complexity measures: Rate of growth, basic time analysis of an algorithm; ordering notion- detailed timing analysis - space complexity.
Arrays: Arrays and their representation-Single and multidimensional arrays-row major and column major ordering-address calculation.

UNIT II

Stacks and Queues: Stacks and Queues-representation and Manipulation-Uses of stacks and Queues- Recursion, polish expressions
Storage   Management: Dynamic   storage management-Reclamation   and compaction- Boundary Tag method.

UNIT III

Linked lists: Pointers and their uses- Continuous vs. linked storage. Singly and doubly linked lists- Operations on lists-representation of sparse matrices and polynomials using lists- Circular lists- generalized lists
Trees: Trees-Binary and N-ary trees-Representation of trees-Tree traversal algorithms and advantages- Conversion of general trees to Binary trees-B trees- Applications

UNIT IV

Sorting and Searching: Searching and sorting-Sequential, Binary and hashed Searching- Bubble sort, Insertion sort, shell sort, Merge sort and Quicksort-Comparison.
1. Data Structure & Algorithms, Aho A.V. & Ullman J.E.
2. Data Structures using C, Aron M. Tannenbaum.
3. Introduction to Data Structures, Bhagat Singh & Thomas Naps.
4. An Introduction to Data Structures with Applications, Trembley & Sorenson.
Suggested E-Resources:
1. https://ocw.mit.edu/courses/6-851-advanced-data-structures-spring-2012/resources/
2. https://archive.nptel.ac.in/courses/106/102/106102064/

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Course Code   : 24MCA9102T
Title of the course   : DBMS(Database Management System)
Credit of the Course : 3
Type of the Course   : DSC Course for MCA in computer science
Paper-   II

Objectives of the Course:

1. Helps students in understanding the concepts of databases
2. Helps students in Modelling the databases with different types of models available.
3. Helps students in designing the databases.
4. Helps students to learn about how to store and retrieve the data from databases
5. Helps students to write and execute difficult queries
6. Helps students to learn advance concepts of DBMS

Learning Outcomes:

1. On successful completion of the course, students will be able to:
2. Learn about different features of database management systems.
3. Differentiate between database systems and file systems.
4. Model a database system using modelling tools like ER diagrams
5. Design database schemas based on the conceptual model.
6. Write queries in relational algebra / SQL.
7. Normalizedatabase schema.
8. Understand ACID Properties of transactions

UNIT I

Introduction: Database system applications, database systems versus file systems, views of data, data models, database languages, database users and administrators, transaction management, database system structure, application architecture.
Data modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, concepts of super key, candidate key, primary key, unique key, generalization, aggregation, reduction of an ER diagram to tables.

UNIT II

Relational model: Structure of relational databases, relational algebra, tuple relational calculus, domain relational calculus.
SQL: Characteristics of SQL, advantages of SQL, types of SQL commands, SQL operators and their procedure, tables, views and indexes, queries and sub-queries, aggregate functions, insert, update and delete operations, joins, union, intersection, minus, cursors in SQL. Domain constraints, referential integrity, assertions, triggers, authorization and authentication. Relational database design & normalization: Functional dependencies, normal forms- First, second, third, BCNF, fourth and fifth normal forms, decomposition

UNIT III

Indexing and Hashing: Basic concepts, ordered indices, B-tree, B+ tree, static hashing, dynamic hashing, comparison of ordered indexing and hashing, index definition in SQL, multiple-key access. Query Processing & Optimization: Measure of query cost, selection operation, sorting, join operation, other operations
Transactions: Transaction concept, atomicity and durability, concurrent execution, serializability, conflict and view, testing of serializability.
Concurrency Control: Concurrency Control, Locking Techniques for Concurrency control, Time stamping protocols for concurrency control, validation-based protocols

Recovery System: Failure classification, storage structure (RAID), recovery and atomicity, log based recovery, shadow paging

UNIT IV

Object Oriented Database Concept: Data types and Object, Evolution of Object-Oriented Concepts, Characteristics of Object-Oriented Data Model. Object Hierarchies, Generalization, Specialization, Aggregation.
Object Schema. Inter-object Relationships, Similarities and difference between Object Oriented Database model and Other Data models. Object Oriented DBMS Architecture, Application Selection for Object Oriented DBMS, Data Access API (ODBC, DAO, ADO, JDBC, OLEDB)

References Books
1. Database Systems Concepts, Korth
2. Fundamental of database system - Elmasiri and Navathe
3. Database Systems, Date C.J., AddisionWesley

Suggested E-Resources:
1. W3Schools
2. Codecademy
3. LearnSQL.com
4. Khan Academy
5. SQLZoo
6. Tutorialspoint
7. SoloLearn

Semester – I

Code of the course   : 24MCA9103T
Title of the course   : Web Development
Credit of the Course : 3
Type of the Course   : DCC Course for MCA in computer science
Paper   : III

Objectives of the Course:
1. This Course helps students in designing methodologies for better programs, including HTML, JavaScript, CSS and PHP.
2. Students will have a quick review of the Internet and Internet programming concepts, Web Servers and Web Application Servers.
3. Students would be able to write HTML, JavaScript and CSS codes.
4. Students will be able to evaluate (benchmark) Website performance.

Learning Outcomes:
1. Understand, analyze and design creative, dynamic and interactive websites.
2. Understand current and evolving Web languages for integrating media and user interaction in both front end and back end elements of a Web site
3. Able to write HTML, JavaScript and CSS.
4. Understand PHP, working with files, forms & Database.

UNIT I

Introduction of HTML: introduction, markup language, editing HTML: common tags, headers, text styles, linking, images, formatting text, horizontal rules and more line breaks, unordered lists, nested and ordered lists, basic HTML tables: intermediate HTML tables and formatting: basic HTML forms, more complex HTML forms, HTML5: Input Types & Attributes, internal linking, creating and using image maps

UNIT II

Java script Introduction to scripting: introduction- memory concepts- arithmetic- decision making. Java script control structures, Java script functions: introduction, program modules in java script

function definitions, duration of identifiers, scope rules, recursion, java script global functions. Java script arrays: introduction, array-declaring and allocating arrays, references and reference parameters – passing arrays to functions, multiple subscripted arrays, introduction to DHTML and JQuery.

UNIT III

Cascading Style Sheets: introduction, inline styles, external style sheets, creating style sheets with the style element, conflicting styles, linking external style sheets, positioning elements, backgrounds, element dimensions, text flow and the CSS box model, user style sheets

UNIT IV

HTML: HTML form using GET, POST, REQUEST, SESSION, COOKIE variables, Sending e-mail, Database Operations with PHP, Connecting to My-SQL (or any other database), selecting a db.

Introduction to PHP & web server Architecture Model Overview of PHP Capabilities, PHP HTML embedding tags & syntax, Simple script examples, PHP & HTTP Environment variables. PHP Language Core-Variables, constants, data types, PHP operators, flow control & loops, Arrays, string, functions Include & require statements, Simple File & Directory access operations, Error handling, Processing.

Books
1. Internet and World Wide Web, H.M. Deitel, P.J. Deitel, A.B. Goldberg Pearson Education
2. Web Technologies Black Book Dreamtech Press (2018)
3. Web Technologies by Achyut S Godbole and Atul Kahate
4. PHP 5.1 for Beginners Ivan Bayross Sharanam Shah, SPD Publisher

Suggested E-Resources:
1. https://nptel.ac.in/courses/106106222
2. https://learn.shayhowe.com/html-css
3. http://www.w3schools.com
4. www.devguru.com

Semester – I

Code of the course   : 24MCA9104T
Title of the course   : Operating System
Type of the Course   : DCC Course for MCA in computer science
Paper   : IV
Objective of the course:

1. To understand the need of Operating Systems
2. To understand the Roles of an Operating System
3. To understand how these Roles are performed by an Operating System

Learning outcomes:
1. Student will understand the need and role of the Operating System.
2. Students will also understand the various alternative techniques/ algorithms to handle various resources utilization.
3. Students will understand how CPU scheduling is done.
4. Students will learn how memory management is done.
5. Students will learn how to resolve the process synchronization issues.
6. Students will also learn how to avoid deadlock and how to recover if the system goes in the deadlock.

UNIT I

Introduction to Operating Systems: Mainframe systems, desktop systems, multiprocessor systems,

distributed systems, clustered systems, real-time systems, handheld systems. Feature migration and computing Environments.

Computer System Structures: Computer system operation, I/O structure, storage structure, storage hierarchy, hardware protection, network structure.

Operating System Structures: System components, operating system services. System calls, system programs, system structure, virtual machines.

UNIT II

Processes: Process concept, process scheduling, operations on processes, cooperating processes, Inter-process communication, communication in client-server systems.

Threads: Overview, multithreading models, threading issues.

UNIT III

CPU Scheduling: Basic Concepts, scheduling criteria, scheduling algorithms, multiple- processor scheduling, real-time scheduling, algorithm evaluation.

Process Synchronization: The critical section problem, synchronization hardware, semaphores, classical problems of synchronization, monitors.

Deadlocks: System model, deadlock characterization, methods for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock.

UNIT IV

Storage and Memory Management: Swapping, contiguous memory allocation, paging, segmentation, segmentation with paging.

Virtual Memory: Demand paging, process creation, page replacement, allocation of frames, thrashing.

File System Interface: File concept, access methods, directory structure, file system mounting, file sharing, protection.

File-System Implementation: File system structure, file-system implementation, directory implementation, allocation methods, free space management, efficiency and performance.

Protection: Goals of protection, domain of protection, access matrix, implementation of access matrix, revocation of access rights.

Security: The security problem, user authentication, program threats, system threats, security systems and facilities, intrusion detection, cryptography.

References Books

1. Operating System Concepts, Silberschatz G.G., John Wiley &SonsInc.
2. Modern Operating Systems, Andrew S. Tanenbaum,Pearson Prentice Hall,
3. Advanced Concepts in Operating Systems Distributed, Database, and Multiprocessor
4. Operating Systems, Mukesh Singhal and Niranjan G. Shivaratri, Tata McGraw-Hill

Suggested E-Resources:

1. https://onlinecourses.nptel.ac.in/noc20_cs04/preview
2. https://www.udacity.com/course/introduction-to-operating-systems--ud923
3. https://www.coursera.org/learn/os-power-user
4. https://www.youtube.com/watch?v=mXw9ruZaxzQ
5. https://www.udemy.com/courses/it-and-software/operating-systems/

Semester – I

Course Code: 24MCA9105T
Title of the Course: Basic Maths
Credit of the Course: 3
Type of the Course: DSC for MCA in computer science
Paper -   V

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Objectives of the Course:
1. Computer science is a division or subset of general computer science and mathematics which focuses on more abstract or mathematical aspects of computing.
2. Students will be able to apply problem-solving and logical skills.
3. Students will have a deeper understanding of mathematical theory.
4. Students will be able to communicate mathematical/logical ideas in writing.

Learning Outcomes:
1. To be able to apply mathematical logic to solve problems.
2. To have the concept of relations and sets.
3. Understand different operations on matrices.
4. Apply Propositional logic and first order logic to solve problems.
5. Analyze different types of Probability and their application.

UNIT I

Set:- Introduction, Objectives, Representation of Sets (Roster Method, Set Builder Method), Types of Sets (Null Set, Singleton Set, Finite Set, Infinite Set, Equal Set, Equivalent Set, Disjoint Set, Subset, Proper Subset, Power Set, Universal Set) and Operation with Sets (Union, Intersection, Difference, Symmetric Difference of Sets), Universal Sets, Complement of a Set, Applications of Sets.

Mathematical Logic:- Basic Logical connections; Conjunction; Disjunction; Negation; Negation of Compound Statements; Truth tables. Tautologies: Logical Equivalence; Applications.

UNIT II

Matrices and Determinants: Definition of a matrix; Representation of a Matrix; Equality of Matrices; Operations on matrices; Square Matrix and its inverse; Multiplication of 2 matrices; Transpose of a Matrix, Determinants: Properties of determinants; the inverse of a matrix; solution of equations using matrices and determinants; solving equations using determinants.

UNIT III

Counting: Basic counting principles, factorial notation, binomial coefficient, permutations, combinations, pigeon-hole principle, inclusion-exclusion principle, ordered and unordered partition.

UNIT IV

Probability: Concept of probability; sample space and events; three approaches of probability; Kolmogorov"s axiomatic approach to probability; conditional probability and independence of events; Baye"s theorem.

Progressions Introduction, Arithmetic Progression, Sum of Finite number of quantities in A.P, Arithmetic Means, Geometric Progression, Geometric Mean, Harmonic Progression, Harmonic Mean

References Books
1. Discrete Mathematics, Lipschutz S., Lipson M.
2. College Mathematics, Schaum"s Series, TMH
3. Elements of Mathematics, ML Bhargava
4. Discrete Mathematical Structures with Applications to Computer Science, Trembley J.P. and Manohar R.P.
5. Discrete Mathematical Structures for Computer Science, Kolman B., Busby R, PHI

Suggested E-Resources:
1. www.see.leeds.ac.uk/geo- maths/basic_maths.pdf
2. www.britannica.com/science/matrix-mathematics
3. www.pdfdrive.com/schaums-outline-of-discrete-mathematics-third-editionschaumse6841453.html
4. MIT – Introduction to Probability and statistics by Jeremy Orloff and Jonathan Bloom
5. https://ocw.mit.edu/courses/mathematics/18-05-introduction-to-probabilityand-statistics-spring-2014/index.htm

Semester-I

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Data Structures Lab	
	Credit: 3
	Code of the course : 24MCA9101P

S.No.	**List of Experiments**
1.	Write a C++ program to implement recursive and non-recursive i) Linear search ii) Binary search
2.	Write a C++ program to implement i) Bubble sort ii) Selection sort iii) quick sort iv) insertion sort
3.	Write a C++ program to implement the following using an array. a) Stack ADT b) Queue ADT
4.	Write a C++ program to implement list ADT to perfo,m the following operations Insert an element into a list. Delete an element from a list Search for a key element in a list count number of nodes in a list
5.	Write C++ programs to implement the following using a singly linked list. Stack ADT b) Queue ADT
6.	Write C++ programs to implement the deque (double-ended queue) ADT using a doubly-linked list.
7.	Write a C++ program to perfom1 the following operations: Insert an element into a binary search tree. Delete an element from a binary search tree. Search for a key element in a binary search tree.
8.	Write C++ programs for implementing the following sorting methods a) Merge sort b) Heap sort
9.	Write C++ programs that use recursive functions to traverse the given binary tree in Preorder b) inorder and c) postorder.
10.	Write a C++ program to perform the following operations Insertion into a B-tree b) Deletion from a B- tree
11.	Write a C++ program to pcrfom1 the following operations Insertion into an AVL-trce b) Deletion from an AVL-trcc

Suggested Books:

- Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++," Pearson Education India, Fourth Edition, 2014.
- Yashavant Kanetkar, Data Structures Through C++ By Kanctkar, BPB Publications
- K.R. Venugopal, Raj Kumar Buyya, "Mastering C++," McGraw-Hill, 2017
- Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to ALGORITHMS," PHI, India Second Edition.
- E. Balagurusamy, "Object-Oriented Programming with C++," Tata McGraw Hill, 2006
- Yahwant Kanctkar, "C++ Programming", BPB Publication
- Mary E. S. Loomis, "Data Management and File Structure," PHI, Second Edition, 2009.
- D.S Malik, "Data Structures using C++," Ccngagc Learning, 2nd Edition, 2009
- E. Horowitz &Sahni, "Fundamental Data Structure," Galgotia Book Source, 2007.

Code of the course   : 24MCA9102P
Title of the course   : DBMS Lab (Database Management System Lab)
Credit of the Course   : 3
Type of the Course   : DCC Course for MCA in computer science

bjectives of the Course:

1. This Course helps students in implementing the concepts of databases learned in theory.
2. This Course helps students in Modelling the databases with different types of models available.
3. This course helps students to perform the operations to store and retrieve the data from databases

Learning Outcomes:

On successful completion of the course, students will be able to:

1. Model a database system using modelling tools like ER diagrams
2. Design database schemas based on the conceptual model.
3. Write queries in relational algebra / SQL.

List of sample programs for reference

1. Create a database having two tables with the specified fields, to computerize a library system of a MLSU.
   LibraryBooks (Accession number, Title, Author, Department, PurchaseDate, Price) IssuedBooks (Accession number, Borrower)

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
   b) Delete the record of book titled "Database System Concepts".
   c) Change the Department of the book titled "Discrete Maths" to "CS"
   d) List all books that belong to "CS" department.
   e) List all books that belong to "CS" department and are written by author "Navathe".
   f) List all computer (Department = "CS") that have been issued.
   g) List all books which have a price less than 500 or purchased between "01/01/1999" and "01/01/2004".

2. Create a database having three tables to store the details of students of Computer Department in your college, as per the given schema.
   Personal information about Student (College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at 10 + 2, Phone number)
   Paper Details (Paper code, Name of the Paper)
   Student Academic and Attendance details (College roll number, Paper code, Attendance, Marks in home examination).

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
   b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper 2.
   c) List all students who live in "Delhi" and have marks greater than 60 in paper 1.
   d) Find the total attendance and total marks obtained by each student.
   e) List the name of student who has got the highest marks in paper 2.

3. Create the following tables and answer the queries given below:
   Customer (CustID, email, Name, Phone, ReferrerID)
   Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)
   BicycleModel (ModelNo, Manufacturer, Style)
   Service (StartDate, BicycleID, EndDate)

   a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each

table.
b) List all the customers who have the bicycles manufactured by manufacturer"HONDA"
c) List the bicycles purchased by the customers who have been referred by customer "C1"
d) List the manufacturer of red colored bicycles.
e) List the models of the bicycles given for service.

4. Create the following tables, enter at least 5 records in each table and answer the queries given below.

EMPLOYEE (Person_Name, Street, City) WORKS
(Person_Name, Company_Name, Salary)
COMPANY (Company_Name, City)
MANAGES (Person_Name, Manager_Name)

a) Identify primary and foreign keys.
b) Alter table emp
c) Find the name of all managers who work for both Samba Bank and NCB Bank.
d) Find the names, street address and cities of residence and salary of all employees who earn more than $10,000.
e) Find the names of all employees who live in the same city as the company for which they work.
f) Find the highest salary, lowest salary and average salary paid by each company.
g) Find the sum of salary and number of employees in each company.
h) Find the name of the company that pays highest salary.

5. Create the following tables, enter at least 5 records in each table and answer the queries given below.

Suppliers (SNo, Sname, Status, SCity)
Parts (PNo, Pname, Colour, Weight, City)
Project (JNo, Jname, Jcity)
Shipment (Sno, Pno, Jno, Quantity)

a) Identify primary and foreign keys.
b) Get supplier numbers for suppliers in Paris with status>20.
c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.
d) Get suppliers names for suppliers who do not supply part P2.
e) For each shipment get full shipment details, including total shipment weights.
f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.
g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.
h) Get the names of cities that store more than five red parts.
i) Get full details of parts supplied by a supplier in London.
j) Get part numbers for part supplied by a supplier in London to a project in London.
k) Get the total number of project supplied by a supplier (say, S1).
l) Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).

Suggested E-Resources:
Online virtual lab

Web Development Lab		Credit: 3
		Code of the course : 24MCA9103P
S.No.		List of Experiments
1.	Program to Implement Basic Html Tags.	
2.	Program to Implement Table Tags.	
3.	Design a Student Registration form using HTML.	
4.	Perfonn the validation of a form using Javascript.	
5.	Write a JavaScript to design a simple calculator to perform the following operations: sum, product, difference, and quotient.	
6.	Write a JavaScript that calculates the squares and cubes of the numbers from O to 10 and outputs HTML text that displays the resulting values in an HTML table fonnat.	
7.	Write a program to the simple calculator using the windows application.	
8.	Write a program working with Page using ASP.Net.	
9.	Write a program to access data sources through ADO.NET.	
10.	Implement Various Types of CSS.	
11.	Using JQuery Implement : i. Selecting Element, Getting Values, Setting Values. ii. Events	
12.	DOM Manipulation with jQuery. Events in JQuery.	
13.	Animation in JQuery.	
14.	AJAX with JQuery.	
15.	Creating & Integrating Plug-ins with Jquery Using JQucry Frameworks	

Suggested Books:

- Ivan Bay Ross, "HTML, DHTML, Javascript, Perl CGI," BPB Publication, 4th Revised Edition, 2010.
- Herbert Schildt, "C# 4.0 The Complete Reference", McGraw-Hill Education, 15¹ Edition, 2010.
- Paul Dcitel, Harvey Deitel, Abbey Deitel, "Internet & World Wide Web: How to Program," Pearson, 5th Edition, 2018.
- Jason N. Gaylord, Christian Wenz, Pranav Rastogy, Todd Miranda, Scott Hanselman, "Professional ASP.NET 4.5 in C# and VB", Wrox Publication, 1st Edition, 2013.
- James L Mohler and Jon Duff. "Designing Interactive Web Sites," Delmar Thomson Leaming, I st Edition, 2000.
- John Pollock, "JavaScript: A Beginner's Guide," TMH, 5th Edition, 2020.
- Stephen Walther, Kevin Hoffman, Nate Dudek, "ASP.NET 4.0 Unleashed", Pearson Education, I st Edition, 2010.
- Jess Chadwick, Todd Snyder, Hrusikesh Panda, "Programming ASP.NET MVC 4", O'Reilly Media, 1st Edition, 2007.

Dicipline Specific Elective(DSE)

Notes: The student is required to select one of the following Papers

Code of the course : 24MCA9106T
Title of the course : MIS & E-Commerce
Credit of the Course : 4
Paper: VI
Objective of the course:

1. Provide students with a foundational understanding of what e-commerce is, its history, and its significance in modern business.
2. Apply sound managerial concepts and principles in the development and operation of information systems
3. Apply systems analysis, IS design and project management concepts effectively
4. Improve business processes through the effective application of information technology concepts and practices
5. Familiarize students with the technologies and platforms used in e-commerce, including websites, mobile apps, payment gateways, and security measures.

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Learning outcomes:

1. Develop problem-solving skills and the ability to adapt to the rapidly changing landscape of e-commerce.
2. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
3. Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program"s discipline.
4. Communicate effectively in a variety of professional contexts.
5. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
6. Function effectively as a member or leader of a team engaged in activities appropriate to the program"s discipline.
7. Support the delivery, use, and management of information systems within an information systems environment.
8. Students will learn about emerging trends and innovations in e-commerce, such as mobile commerce, social commerce, and blockchain technology, and their potential impact on the industry.

Students will learn about different customer service and support options in e-commerce, such as live chat, email, social media, and telephone support.

UNIT I

Management Information Systems - Need, Purpose and Objectives- Contemporary Approaches to MIS – Business processes and Information Systems –Information systems function in Business- Use of Information Systems for competitive advantage - MIS as an instrument for the organizational change: Management issues – Types of Business Information Systems.

UNIT II

Enhancing Decision Making: Information, Management and Decision Making - Models of Decision Making - Classical, Administrative and Herbert Simon's Models - Attributes of information and its relevance to Decision Making - Types of information, Decision Support Systems - Group Decision Support Systems — Executive Support Systems

UNIT III

E-commerce: Introduction, Definition of e-commerce, emergence of Internet, commercial use of Internet, history of e-commerce, advantages and disadvantages of e-commerce
Business models for e-commerce: B2C, B2B, C2C, C2B, brokerage model, aggregator model, infomediaries, communities, value-chain model, manufacturer model, advertising model, subscription and affiliate model

Enabling technologies: Internet Client server applications, networks, Uniform Resource Locator (URL), search engines, software agents, Internet Service Providers(ISP), broadband technologies,Electronic Data Interchange(EDI).
E-payment systems: token-based system, card-based system, e-cash. E-cheque, e-banking, risks, data protection

UNIT IV

E-marketing: characteristics, methods, e-marketing value-chain, site adhesion, browsing behavior model, e- advertising, e-branding, e-marketing strategies
E-security: Security risks, risk management issues, legal and ethical issues, security mechanisms, encryption, digital signature, digital certificates.

References Books

1. Management Information Systems, Laudon and Laudon, 7th Edition, Pearson Education Asia
2. P.T. Joseph, S.J. E-commerce: An Indian Perspective, Prentice Hall India, Second Edition, 2007

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Suggested E-Resources:
1. https://www.drnishikantjha.com/booksCollection/E-Commerce%20.pdf
2. E Commerce Author MS K Bhavithravani.pdf - Google Drive
3. https://www.google.co.in/books/edition/E_commerce/MwEB8LuK0P0C?hl=en&gbpv=1&dq=e+commerce&printsec=frontcover&bshm=rime/1
4. https://nitsri.ac.in/Department/Electronics%20&%20Communication%20Engineering/MIS-Notes_New_-word.pdf
5. https://ebooks.lpude.in/management/mba/term_4/DMGT505_MANAGEMENT_INFORMATION_SYSTEM.pdf
6. https://www.google.co.in/books/edition/Management_Information_Systems_Manageria/ZaNDDAAAQBAJ?hl=en&gbpv=1&dq=mis&printsec=frontcover&bshm=rime/1

Course Code   : 24MCA9107T
Title of the course : Software Engineering
Credit of the Course : 4
Type of the Course   : DCC Course for MCA in computer science
Delivery Type   : Lecture.
Total Lectures   : 60(40+20), 40 lectures for content delivery and 20 hours on diagnostic, formative assessment, class activity and problem solving.

Prerequisites:
Software engineering involves programming and working with computers, it is important to have a basic level of computer proficiency. This includes knowledge of operating systems, file management, and basic software applications.

Objectives of the Course:
The basic objective of software engineering is to develop methods and procedures for software development that can scale up for large systems and that can be used consistently to produce high-quality software at low cost and with a small cycle of time.

Learning outcome
1. Understanding the Software Engineering Fundamentals, Software development Process with different types of models, Project management Concepts.
2. Understand the Software Quality Assurance concepts, Software Configuration Management,
3. Understand the Software Quality Assurance concepts, Software Configuration Management, Analysis Concepts and Principles
4. Get acquainted with Design Concepts and Principles, Software Testing.
5. Understand the purpose of Reengineering with some CASE Tools.

UNIT-I
Software Engineering Fundamentals: Definition of Software, Software characteristics, Software Applications.
Software Process:
Software Process Models - Waterfall model, prototyping model, spiral model, incremental model, concurrent development model.
Project management Concepts: The Management Spectrum - The People, The Product, The Process, The Project.

UNIT –II
Software Process and Project Metrics: Measures, Metrics and Indicators, Software measurement: Size - Oriented Metrics, Function - Oriented Metrics, Extended Function point metrics
Software Project Planning: Project Planning Objectives, Software Project Estimation, Decomposition Techniques - Problem Based Estimation, Process Based Estimation, Empirical Estimation Models- The COCOMO Model

Risk Analysis and Management: Software risks, Risk identification, Risk Projection, Risk Refinement, Risk Mitigation, Monitoring and Management

UNIT –III

Software Quality Assurance: Basic concepts- Quality, Quality Control, Quality Assurance, Cost of Quality, Software Quality Assurance (SQA), Formal Technical Review
Software Configuration Management: Baselines, Software Configuration Items, The SCM Process, Version Control, Change Control, Configuration Audit, Status Reporting.
Analysis Concepts and Principles: Requirements Elicitation for Software, Analysis Principles - The Information Domain, Modeling, Partitioning, Essential and Implementation Views, Specification: Specification Principles, Representation, The Software Requirement Specification (SRS)

UNIT –IV

Design Concepts and Principles: Design Principles, Design Concepts, Abstraction, Refinement, Modularity, Software Architecture, Control Hierarchy, Structural Partitioning, Data Structure, Software Procedure, Information Hiding, Effective Modular Design- Cohesion, Coupling
Software Testing: Testing Objectives & principles, Unit Testing, Integration Testing (Top Down Integration, Bottom Up Integration, Regression Testing, Smoke Testing), Validation Testing (Alpha and Beta Testing), System Testing (Recovery Testing, Security Testing, Stress Testing, Performance Testing).
Reengineering: Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering CASE Tools: What is CASE, Building Blocks of CASE, A Taxonomy of CASE Tools, Integrated CASE Environments, The Integration Architecture, The CASE Repository.

Books
1. Software Engineering, R. Pressman, McGraw-Hill.
2. Software Engineering, K.K. Agrawal and Y. Sing, New Age International.
3. Software Project Management in Practice, P. Jalote, Pearson.

Suggested E-resources
1. https://www.cs.uct.ac.za/mit_notes/software/pdfs/SE_top.pdf
2. https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/Software-Engineering-9th-Edition-by-Ian-Sommerville.pdf
https://www.vssut.ac.in/lecture_notes/lecture1428551142.pdf