

**OUTLINES OF TESTS,
SYLLABI AND COURSES OF READINGS
CREDIT BASED SYSTEM**

**FOR
M.SC(IT)(MASTER IN INFORMATION
TECHNOLOGY)
(SEMESTER SYSTEM)**

M.Sc(IT)-I (Ist & IInd Semester)

[For the Session 2023-24]

**MATA GUJRI COLLEGE
SRI FATEHGARH SAHIB-140406**

MATA GUJRI COLLEGE, SRI FATEHGARH SAHIB

(An Autonomous College)
SYLLABUS
Credit Based System
MSc IT -I
FIRST YEAR-FIRST SEMESTER EXAMINATION
Session 2023-24

OUTLINE OF PAPERS AND TESTS

Code	Title of Paper	Schedule of Teaching (Hours/Week)			Total Hours	Credits	Marks	
		L	T	P			External	Internal
MS-111	Fundamentals of Information Technology	4	0	0	4	4	70	30
MS-112	Programming with Python	4	0	0	4	4	70	30
MS-113	Web Designing using HTML and DHTML	4	0	0	4	4	70	30
MS-114	Operating System	4	0	0	4	4	70	30
MS-115	Programming Lab-I based on MS-112	0	0	6	6	3	70	30
MS-116	Programming Lab-II based on MS-113	0	0	6	6	3	70	30
TOTAL		16	0	12	28	22	420	180

- i. The breakup of marks for the Continuous assessment for theory papers will be as under:

i.	One or two tests out of which minimum one best will be considered for assessment (50% of Total marks)	15 Marks
ii.	Attendance (20% of Total marks)	6 Marks
iii.	Class participation and behaviour (30% of Total marks)	9 Marks

- ii. The breakup of for the Continuous Assessment for the practical will be as under:

	Lab Assignments (20 % of Total marks)	6 Marks
	Viva (50 % of Total marks)	15 Marks
	Attendance/Class participation and behaviour (30 % of Total marks)	9 Marks

MS-111: Fundamentals of Information Technology

Maximum Marks:100

Internal Assessment: 30

External Examination: 70

Minimum Pass Marks: 35%

Maximum Time: 3HRS

Lectures to be delivered: 45-55

Course Objective:The objective of this paper is to familiarize the students with concept of IT basics, computer applications, programming, interactive media, Internet basics etc.

Course Outcomes: After the completion of this course, the students will be able:

CO1: To understand the basics of computer system, its architecture, database and Networks.

CO2: To understand the basic concepts, terminology of IT and familiar with the use of IT tools.

A) Instructions for paper-setters:

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates:

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non programmable scientific calculator is allowed.

UNIT-I

Computer Fundamentals: Block structure of a computer, characteristics of computers, generations of computers, classification of computers on the basis of size and logic. **Number System:** Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, **Binary Arithmetic:** Addition, subtraction and multiplication. **Representation of Information:** Integer and floating point representation, Complement schemes, Character codes (ASCII, EBCDIC, BCD, 8421, 2421, Excess-3, Gray, Hamming) **Memory types:** Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory. **I/O devices:** Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR. **Printers:** Impact, non-impact. **Storage devices:** floppy disk, hard disk, compact disk, tape.

UNIT-II

Computer languages: Machine language, assembly language, higher level language, 4GL.

Introduction to: Compiler, Interpreter, Assembler, System Software and Application Software.

Operating System: classification—simple batch processing, Multiprogramming, Multitasking, parallel Systems, Distributed system, Real time system. **Computer Network and Communication:** Network types, network topologies, network communication devices, physical communication media. **Internet and its Applications:** E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, extranet.

Text Books:

1. D. H. Sanders, “Computers Today”, McGraw Hill

References:

1. David Cyganski, John A. Orr, “Information Technology Inside and Outside” Pearson Education .
2. V. Rajaraman, “Fundamentals of Computers” (2nd edition), Prentice Hall of India, New Delhi.
3. B. Ram, “Computer Fundamentals”, Wiley.
4. Pardeep K. Sinha & Priti Sinha, “Computer Fundamentals”, Sixth Edition, BPB.

Teaching Plan

Week-I	Computer Fundamentals: Block structure of a computer, characteristics of computers, generations of computers
Week-II	Classification of computers on the basis of size and logic.
Week –III	Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems conversion from one system to the other
Week-IV	Binary Arithmetic: Addition, subtraction and multiplication.
Week –V	Representation of Information: Integer and floating point representation, Complement schemes, Character codes (ASCII, EBCDIC)
Week-VI	Character codes (8421, 2421, Excess-3, Gray, Hamming)
Week –VII	Memory types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory
Week-VIII	I/O devices: Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR.
Week –IX	Printers: Impact, non-impact. Storage devices: floppy disk, hard disk, compact disk, tape
Week –X	Computer languages: Machine language, assembly language, higher level language, 4GL.
Week –XI	Operating System: classification–simple batch processing, Multiprogramming, Multitasking, parallel Systems, Distributed system, Real time system, physical communication media.
Week –XII	Internet and its Applications: E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, extranet.

MS-112 Programming with Python

Maximum Marks: 100
Internal Assessment: 30
External Examination: 70
Minimum Pass Marks: 35%

Maximum Time: 3HRS
Lectures to be delivered: 45-55

Course Objective:

The objective of this course is to enable students to learn a new programming language which has high demand in industry. Students are expected to use Dictionary, Functions in effective manner in order to create a reliable and user friendly application.

Course Outcomes

CO1: To provide Basic knowledge of Python and to understand why Python is a useful scripting language for developers.
 CO2: To learn how to design and program Python applications.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non programmable scientific calculator is allowed.

UNIT-I

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Python IDLE, Indentation, Atoms, Identifiers and keywords, Literals.

Operators: Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment and Decrement operator

Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass).

Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison, A find function, Looping and counting, List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists.

UNIT-II

Tuples and Dictionary: Update and delete tuples, basic tuples operation, indexing and slicing tuples, Update and delete dictionary, properties of dictionary keys.

Functions: arguments, parameter pass by reference, default arguments, variable length arguments, return argument, scope of variables, Recursion, Stack diagrams for recursive functions, Anonymous function.

File handling: Introduction, Reading and writing text files.

Object Oriented Programming: Introduction to Classes, Objects and Methods, Standard Libraries.

Exceptions: Handling an exception, except Clause, try-finally Clause, Raising an Exceptions

References :

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. How to think like a computer scientist : learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers. 1st Edition – Freely available online.

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Teaching Plan

Week-I	Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Python IDLE.
Week-II	Indentation, Atoms, Identifiers and keywords, Literals.
Week-III	Operators: Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment and Decrement operator
Week-IV	Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping)
Week-V	Conditional Statement, Exit function, Difference between break, continue and pass.
Week-VI	Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison,
Week-VII	A find function, Looping and counting, List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists.
Week-VIII	Tuples and Dictionary: Update and delete tuples, basic tuples operation, indexing and slicing tuples, Update and delete dictionary, properties of dictionary keys.
Week-IX	Functions: arguments, parameter pass by reference, default arguments, variable length arguments, return argument, scope of variables, Recursion, Stack diagrams for recursive functions, Anonymous function
Week-X	File handling: Introduction, Reading and writing text files. Object Oriented Programming: Introduction to Classes, Objects and Methods, Standard Libraries.
Week-XI	Exceptions: Handling an exception, except Clause, try-finally Clause, Raising an Exceptions
Week-XII	Revision of Syllabus

MS-113 Web Designing using HTML and DHTML

Maximum Marks: 100
Internal Assessment: 30
External Examination: 70
Minimum Pass Marks: 35%

Maximum Time: 3HRS
Lectures to be delivered: 45-55

Course Objective: The objective of this paper is to familiarize the students with basic HTML elements to create web pages. Understand how to use HTML tags and tag attributes to control a Web page's appearance.

Course Outcomes: On completion of this course, the student will be able to:

CO1: Students are able to develop a dynamic webpage by the use of HTML and DHTML.

CO2: Write a well formed / valid XML document.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non programmable scientific calculator is allowed.

Unit I

Internet Basics: WWW, Web pages, Web Browsers, URL, communicating on the internet, internet domains, internet server identities, establishing connectivity on the internet client IP address.

Introduction to HTML: HTML tags and attributes, paired and unpaired tags, Text-formatting tags- bold, italic, underline, strike, superscript, subscript, font face, font size, font color, marquee tag. **Lists:** Type of Lists (Unordered List, Ordered Lists, Definition Lists), Nested Lists. **Tables:** introduction (header, data rows, the caption tag), using width and border, attribute, using cell padding attribute, using cell spacing attribute, using BGCOLOR Attribute, using COLSPAN and ROWSPAN attributes. cells spanning multiple row and columns, coloring cells, column specification, Presenting information in tables, table attributes.

Hyperlinks: Creating external and internal links, using images as links.

Unit II

Forms: Introduction, form elements, Input elements, different control types created with input elements, button elements, text area element, drop down lists, action attributes and method attributes

DHTML and Style Sheets: Defining styles, Elements of styles, linking a stylesheet to an HTML Documents, In-Line Styles, External style sheets, Internal style sheets, Multiple Styles..

CSS properties: CSS Font Properties, CSS Text Properties, CSS Background Properties, CSS Border Properties, CSS Margin Properties. CSS List Properties.

Text Books:

1. Thomas A. Powell , "HTML: The Complete Reference", Osborne/McGraw-Hill
2. HTML 4.0 Unleashed by Rick Dranell; Tech Media Publications

Reference Books:

1. Teach Yourself HTML 4.0 with XML, DHTML and Java Script by Stephanie, Cottrell, Bryant; IDG Books India Pvt. Ltd., New Delhi

Teaching Plan

Week-I	Internet Basics: WWW, Web pages, Web Browsers, URL, communicating on the internet, internet domains, internet server identities, establishing connectivity on the internet client IP address.
Week-II	Introduction to HTML: HTML tags and attributes, paired and unpaired tags, Text-formatting tags-bold, italic, underline, strike, superscript, subscript, font face, font size, font color, marquee tag.
Week –III	Lists: Type of Lists (Unordered List, Ordered Lists, Definition Lists), Nested Lists.
Week-IV	Tables: introduction (header, data rows, the caption tag), using width and border, attribute, using cell padding attribute, using cell spacing attribute, using BGCOLOR Attribute, using COLSPAN and ROWSPAN attributes.
Week –V	Cells spanning multiple row and columns, coloring cells, column specification, Presenting information in tables, table attributes.
Week-VI	Hyperlinks: Creating external and internal links, using images as links.
Week –VII	Forms: Introduction, form elements, Input elements, different control types created with input elements, button elements, text area element, drop down lists, action attributes and method attributes
Week-VIII	DHTML and Style Sheets: Defining styles, Elements of styles, linking a stylesheet to an HTML Documents.
Week –IX	In-Line Styles, External style sheets, Internal style sheets, Multiple Styles..
Week –X	CSS properties: CSS Font Properties, CSS Text Properties, CSS Background Properties, CSS Border Properties, CSS Margin Properties.CSS List Properties.

MS-114 OPERATING SYSTEM

Maximum Marks: 100

Internal Assessment: 30

External Examination: 70

Minimum Pass Marks: 35%

Maximum Time: 3HRS

Lectures to be delivered: 45-55

Course Objective: The objective of this paper is to familiarize the students with concept of Operating Systems & their functions and the need for special purpose operating system with the advent of new emerging technologies.

Course Outcomes: On completion of this course, the student will be able to:

CO1: describe basic functions of an Operating System.

CO2: describe different techniques for managing computer resources like CPU, memory, file and devices.

CO3: implement simple algorithms for managing computer resources

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non programmable scientific calculator is allowed.

Unit-I

Introduction to Operating System: Definition, Types of Operating system, Operating system components, Operating system services. Process Management: Process concept, Process cs. threads, CPU scheduling criteria, Scheduling algorithms, and Algorithm evaluation Deadlocks: Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, avoidance, detection and recovery. File Management: File concept, Access methods, directory structure, Allocation methods – contiguous, linked and indexed.

Unit-II

Memory Management: Background, logical vs. physical address space, Contiguous memory management schemes using Multi partition memory allocation using fixed number of tasks and variable number of tasks, paging and segmentation. Virtual Memory management: Concept, demand paging and demand segmentation. Mass storage structure: Disk structure, disk scheduling algorithms. Protection: Goals of protection, Access matrix. Security: Security problem, Program threats, system threats, User Authentication, Cryptography.

Text Book:

1. Silberschatz and Galvin, "Operating System Concepts", Addison-Wesley publishing.

Reference Books:

- 1 Nutt Gary, "Operating Systems" Addison Wesley Publication.
- 2 Hansen, Per Brinch, "Operating System Principles", Prentice-Hall.
- 3 N. Haberman, "Introduction to Operating System Design", Galgotia Publications.
- 4 Hansen, Per Brich, "The Architecture of Concurrent Programs", PHI.
- 5 Shaw, "Logical Design of Operating System", PHI.

Teaching Plan

Week-I	Introduction to Operating System: Definition, Types of Operating system, Operating system components, Operating system services.
Week-II	Process Management: Process concept, Threads,
Week –III	CPU scheduling criteria, Scheduling algorithms, and Algorithm evaluation
Week-IV	Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, avoidance, detection and recovery.
Week –V	File Management: File concept, Access methods, directory structure, Allocation methods – contiguous, linked and indexed.
Week-VI	Memory Management: Background, logical vs. physical address space,
Week –VII	Contiguous memory management schemes using Multi partition memory allocation using fixed number of tasks and variable number of tasks,
Week-VIII	paging and segmentation.
Week –IX	Virtual Memory management: Concept, demand paging and demand segmentation.
Week –X	Disk structure, disk scheduling algorithms. Protection: Goals of protection, Access matrix.
Week –XI	Security: Security problem, Program threats, system threats, User Authentication, Cryptography.

MS-115 Programming Lab-I (Based on MS-112)

Maximum Marks: 100

Maximum Time: 3HRS

External Examination: 70

Practical sessions to be conducted: 45-55

Internal Assessment: 30

Minimum Pass Marks: 35%

Course Objective: The objective of this course is to enable students to learn a new programming language which has high demand in industry. Students are expected to use Dictionary, Functions in effective manner in order to create a reliable and user friendly application.

This laboratory course will mainly comprise of exercise based on subject MS-112 (Programming Python)

***Maximum Marks for Continuous Assessment: 30**

Maximum Marks for Semester Examination: 70

MS-116 Programming Lab-II
(Based on MS-113)

Maximum Marks: 100

External Examination:70

Internal Assessment: 30

Minimum Pass Marks: 35%

Maximum Time: 3HRS

Practical sessions to be conducted: 45-55

Course Objectives: The purpose of this course is to introduce to students to study designing the web pages and designing web sites using the latest developments in the field and creating a functional Web site.

This laboratory course will comprise as exercises to supplement what is learnt under paper MS-115 Programming Lab-II Web Designing Using HTML and DHTML.

*** Maximum Marks for Continuous Assessment: 30**

Maximum Marks for Semester Examination: 70

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SYLLABUS
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MSc IT -I
FIRST YEAR-SECOND SEMESTER EXAMINATION
Session 2023-24
OUTLINE OF PAPERS AND TESTS

Code	Title of Paper	Schedule of Teaching (Hours/Week)			Total Hours	Credits	Marks	
		L	T	P			External	Internal
MS-121	Object Oriented programming Using C++	4	0	0	4	4	70	30
MS-122	Database Management System	3	0	2	5	4	70	30
MS-123	Java Script	4	0	0	4	4	70	30
MS-124	Computer Networks	4	0	0	4	4	70	30
MS-125	Programming Lab-based on MS-121III	0	0	6	6	3	70	30
MS-126	Programming Lab-IV based on MS-123	0	0	6	6	3	70	30
TOTAL		15	0	14	30	22	420	180

i The breakup of marks for the Continuous assessment for theory papers will be as under:

iv.	One or two tests out of which minimum one best will be considered for assessment (50% of Total marks)	15 Marks
v.	Attendance (20% of Total marks)	6 Marks
vi.	Class participation and behaviour (30% of Total marks)	9 Marks

iii. The breakup of for the Continuous Assessment for the practical will be as under:

	Lab Assignments (20 % of Total marks)	6 Marks
	Viva (50 % of Total marks)	15 Marks
	Attendance/Class participation and behaviour (30 % of Total marks)	9 Marks

MS-121 Object Oriented programming Using C++**Maximum Marks: 100****Maximum Time: 3HRS****Internal Assessment: 30****Lectures to be delivered: 45-55****External Examination: 70****Minimum Pass Marks: 35%**

Course Objective: The objective of this course is to understand how C++ improves C with object-oriented features and understand the concept of data abstraction and encapsulation.

Course Outcomes: On completion of this course, the student will be able to:

CO1: Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism.

CO2: Understand advanced features of C++ specifically stream I/O, templates and operator overloading.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non programmable scientific calculator is allowed.

Unit-I

Evolution of OOP: Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms. Characteristics of Object Oriented Programming: Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types. **Introduction to C++:** Identifier, Keywords, Constants, variables, expressions, manipulators. **Operators:** Arithmetic, relational, logical, conditional and assignment. Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements. **Storage Classes:** Automatic, Static, Extern, Register. **Arrays:** Arrays as Character Strings, Structures, Unions. **Pointers:** Pointer Operations Pointer Arithmetic, **Functions:** Prototyping, Definition and Call, Parameter Passing: by value, by address and by reference, recursion, function overloading.

Unit-II

Classes and Objects: Class Declaration and Class Definition, Defining member functions, making functions inline, nesting of member functions, friend functions and friend classes. **Constructors:** properties, types of constructors (Default, parameterized and copy), **Destructors:** properties, Rules for constructors and destructors. Dynamic memory allocation using new and delete operators. **Inheritance:** types of inheritance: Single, Multiple, Multilevel and Hybrid. **Polymorphism:** Methods of achieving polymorphic behaviour, **Operator overloading:** overloading binary operator, overloading unary operators, rules for operator overloading, Function overloading: early binding, late binding. **Files and streams:** Classes for file stream operations, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations.

Text Books:

1. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publications

References:

1. Bjarne Strastrup, "The C++ Programming Language", Addison-Wesley Publication Co., 4th Edition
2. E. Balagurusamy, "Object Oriented Programming with C++", Tata McGraw-Hill, 6th Edition
3. Schildt, "The Complete Reference C++", Tata McGraw-Hill, 4th Edition

Teaching Plan

Week-I	Evolution of OOP: Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms. Characteristics of Object Oriented Programming: Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types.
Week-II	Introduction to C++: Identifier, Keywords, Constants, variables, expressions, manipulators.
Week -III	Operators: Arithmetic, relational, logical, conditional and assignment. Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements.
Week-IV	Storage Classes: Automatic, Static, Extern, Register. Arrays: Arrays as Character Strings, Structures, Unions.
Week -V	Pointers: Pointer Operations Pointer Arithmetic,
Week-VI	Functions: Prototyping, Definition and Call, Parameter Passing: by value, by address and by reference, recursion, function overloading.
Week -VII	Classes and Objects: Class Declaration and Class Definition, Defining member functions, making functions inline, nesting of member functions, friend functions and friend classes
Week-VIII	Constructors: properties, types of constructors (Default, parameterized and copy),
Week -IX	Destructors: properties, Rules for constructors and destructors. Dynamic memory allocation using new and delete operators.
Week -X	Inheritance: types of inheritance: Single, Multiple, Multilevel and Hybrid.
Week -XI	Polymorphism: Methods of achieving polymorphic behaviour, Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading, Function overloading: early binding, late binding.
Week-XII	Files and streams: Classes for file stream operations, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations.

MS-122 DBMS**Maximum Marks: 100****Maximum Time: 3HRS****Internal Assessment: 30****Lectures to be delivered: 45-55 External****Examination: 70**

Course Objectives : The objective of this course is to expose the students to the fundamentals & basic concepts in Data Base Management Systems. This course explains techniques for database design, database recovery and protection.

Course Outcomes: On completion of this course, the student will be able to:

CO1: Demonstrate an understanding of the elementary & advanced features of DBMS.

CO2: Describe DBMS architecture, physical and logical database designs, database modeling, relational, hierarchical and network models.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non programmable scientific calculator is allowed.

UNIT-I

Traditional file processing system: characteristics, limitations. **Database:** definition. **DBMS:** definition, characteristics, advantages, database schema, instance, DBA and its responsibilities, three level architecture of DBMS, mapping between different levels, **Data independence.**

Database languages: DML, DCL, DDL Keys: primary, candidate, super, foreign, composite.

E-R MODEL: Definition, Entity and Relationship, cardinality of a relationship, E-R Diagram Notations, Modeling using E-R Diagrams, weak entity sets, strong entity sets, converting E-R diagrams to tables. Aggregation, Generalization, Specialization.

Data Base Model: Hierarchical, Network, Relational Models & their difference.

Unit-II

Normalization: Definition, Need, Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive dependency, Multivalued Dependency, Types of Normal Forms:(1NF,2NF,3NF,BCNF).

Database concurrency: definition, Problems of concurrency: Lost Update, Dirty read, Incorrect Summary.

Concurrency control techniques: Locking, Deadlock.

Introduction to Database Recovery: Transaction Log: Deferred Update

Introduction to Database Security: Privileges, Granting and Revoking Privileges and roles

Text Book:

1. ElmasryNavathe, "Fundamentals of Database System", Pearson Education

Reference Books:

1. Oracle SQL Complete Reference", Tata McGraw-Hill.
2. T. Connolly, C Begg, "Database Systems", Pearson Education.
3. Jeffrey D. Ullman, "Principles of Database Systems", Galgotia Publications.
4. Henry F. Korth, A. Silberschhatz, "Database Concepts," Tata McGraw Hill.
5. C.J. Date, "An Introduction to Database Systems", Pearson Education.
6. Naveen Parkash, "Introduction to Database Management", Tata McGraw Hill.
7. Bobrowski, "Client Server Architecture and Introduction to Oracle 7".

Teaching Plan

Week-I	Traditional file processing system: characteristics, limitations. Database: definition.
Week-II	DBMS: definition, characteristics, advantages, database schema, instance, DBA and its responsibilities,
Week -III	three level architecture of DBMS, mapping between different levels, Data independence.
Week-IV	Database languages: DML, DCL, DDL Keys: primary, candidate, super, foreign, composite.
Week –V	E-R MODEL: Definition, Entity and Relationship, cardinality of a relationship, E-R Diagram Notations, Modeling using E-R Diagrams, weak entity sets, strong entity sets, converting E-R diagrams to tables. Aggregation, Generalization, Specialization.
Week-VI	Data Base Model: Hierarchical, Network, Relational Models & their difference.
Week -VII	Normalization: Definition, Need, Functional Dependency, Full Functional Dependency, Partial Dependency, Transitive dependency, Multivalued Dependency, Types of Normal Forms:(1NF,2NF,3NF,BCNF).
Week-VIII	Database concurrency: definition, Problems of concurrency: Lost Update, Dirty read, Incorrect Summary.
Week -IX	Concurrency control techniques: Locking, Deadlock.
Week –X	Introduction to Database Recovery: Transaction Log: Deferred Update
Week -XI	Introduction to Database Security: Privileges, Granting and Revoking Privileges and roles
Week-XII	Revision

MS-123 Java Script

Maximum Marks: 100

Internal Assessment: 30

External Examination: 70

Maximum Time: 3HRS

Lectures to be delivered: 45-55

Course Objectives : To understand advanced and complicated structures and concepts of web design using JavaScript and jQuery

Course Outcomes: On completion of this course, the student will be able to:

CO1: Students are able to develop a dynamic webpage by the use of java Script.

CO2: Implement simple and impressive design techniques, from basics till advanced to focus on goal oriented and user centric designs.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non programmable scientific calculator is allowed.

UNIT-I

Java Script:

Introduction to Java Script: Syntax, Comments, Statements, data types, variable declaration, scope of variables, Expressions and Operators, getting inputs, output functions, **Sequence control statements:** decision taking statements, iterative (looping) statements, break and continue.

Understanding arrays: creating an array, accessing elements in array, functions on arrays, iterating over arrays. **Working with functions:** User defined functions - Function declaration, function calling, function arguments, hoisting, . Built In Functions: math functions, string functions, date and time functions. **Data Validation and verification:** Form validation: email validation, name validation.

UNIT-II

Events in JavaScript: handling events, using addEventListener() method, using on<event> handlers: onchange, onclick, onmouseover, onmouseout, onkeydown, onload events. Key Events: onkeypress, onkeydown, onkeyup, **Document object model (DOM):** Introduction, **fetching elements:** getElementById, getElementsByTagName, getElementsByClassName, query selectors. **jQuery:** Introduction, jQuery selectors and its syntax, events, jQuery effects- hide/show, fade, slide, animate, fetching elements, modifying HTML attributes and CSS attributes using jQuery, event handling using jQuery.

Bootstrap: Introduction to Bootstrap, exploring bootstrap classes – containers, grid system, custom forms, navbars

Text Book : Laura Lemay, Mastering HTML, CSS & JavaScript Web Publishing, BPB Publication

Reference Books: 1. Thomas Powell, The Complete Reference HTML & CSS, TMH 5th edition.

2. David Flanagan , JavaScript : The Definitive Guide, O'REILLY

Teaching Plan

Week-I	Introduction to Java Script: Syntax, Comments, Statements, data types, variable declaration, scope of variables, Expressions and Operators, getting inputs, output functions,
Week-II	Sequence control statements: decision taking statements, iterative (looping) statements, break and continue.
Week –III	Understanding arrays: creating an array, accessing elements in array, functions on arrays, iterating over arrays.
Week-IV	Working with functions: User defined functions - Function declaration, function calling, function arguments, hoisting, . Built In Functions: math functions, string functions, date and time functions.
Week –V	Data Validation and verification: Form validation: email validation, name validation.
Week-VI	Events in JavaScript: handling events, using addEventListener() method, using on<event> handlers: onchange, onclick, onmouseover, onmouseout, onkeydown, onload events. Key Events: onkeypress, onkeydown, onkeyup
Week –VII	Document object model (DOM): Introduction, fetching elements: getElementById, getElementsByTagName, getElementsByClassName, query selectors.
Week-VIII	jQuery: Introduction, jQuery selectors and its syntax, events, jQuery effects- hide/show, fade, slide, animate, fetching elements
Week –IX	Modifying HTML attributes and CSS attributes using jQuery, event handling using jQuery.
Week –X	Bootstrap: Introduction to Bootstrap, exploring bootstrap classes – containers, grid system, custom forms, navbars.
Week –XI	Revision
Week-XII	Revision

MS-124 Computer Networks

Maximum Marks: 70

Time allowed: **3 Hrs.**

Minimum Pass Marks: 35%

Lectures to be delivered: 45-55

Course Objective: The objective of this course is to Students will try to learn the basic taxonomy and terminology of the computer networking and gain core knowledge of Network layer routing protocols.

Course Outcomes: On completion of this course, the student will be able to:

CO1: apply data communication techniques in real-life experiments like telemetry and also develop some basic skills to modify the existing ones to better suit them in different situations.

CO2: develop expertise and skills to apply services of various types of computer networks in various technical and professional fields.

CO3: reduce the overheads of different Reference models and optimize their performances.

A) Instructions for paper-setters

The question paper will consist of three units I, II and III. Unit I and II will have four questions from the respective units of the syllabus carrying 20% marks each. Unit III will have 5-10 short answer type questions which cover the entire syllabus uniformly carrying 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from Unit I and II. Unit III is compulsory.
2. Use of non-programmable scientific calculator is allowed

Unit-I

Introduction: Computer Networks, Topologies, Wireless Networks. **Network Software:** Protocol hierarchies, Design issues for layers, Interfaces and services, types of services, **Reference models:** OSI model, TCP/IP model, and Comparison of TCP/IP and OSI models. **ISDN:** Narrowband ISDN, Broadband ISDN. **Medium Access Sub layer:** Static and dynamic channel allocation, **Multiple access protocols:** ALOHA, CSMA, CSMA/CD, Collision Free protocol, Limited-contention protocols, WDMA. **Introduction to IEEE standards for LAN:** Ethernet LAN (802.3), Token Bus (802.4), Token Ring (802.5), Wireless LAN(802.11, 802.15, 802.16) High speed LAN: FDDI, Fast Ethernet, Fibre channel.

Unit-II

Data Link Layer: Design issues, Elementary data link protocols, sliding windows protocols.

Network Layer: Design Issues. Routing Algorithms –The optimality principle, Shortest path routing, flooding, flow based routing, distance vector routing, link state routing, Hierarchical routing, routing for mobile hosts, broadcast routing, multi cast routing. **Congestion Control** – General principles, prevention policies, Traffic shaping, flow specification, congestion Control in virtual circuits, choke packets, load shedding, jitter control and congestion Control in multicasting. **Internet protocols:** How networks differ, internetworking devices, virtual circuits, connectionless internetworking, IPv4 , IPv6. **Network Security:** Security attacks and Preventions, Cryptography – principles, public key encryption and digital Signatures

Text books:

1. Computer Networks by Tanenbaum A. S., PHI publications, 5th Edition

References:

1. Data Communications & Networking by Frozen, Tata McGraw Hills, 4th Edition.
2. Computer Networks and Internet by D.E. Corner, Addison Wesley, 5th Edition.

3 Inter-networking with TCP-IP ,Principles, Protocols and Architecture by D.E.Cormer and D.L. Steven, Pearson,6th Edition.

4. Data Networks by D. Bertsekas and R.Gallagar,Prentice-Hall, 2nd Edition.

Teaching Plan

Week-I	Introduction: Computer Networks, Topologies, Wireless Networks. Network Software: Protocol hierarchies, Design issues for layers, Interfaces and services, types of services,
Week-II	Reference models: OSI model, TCP/IP model, and Comparison of TCP/IP and OSI models.
Week –III	ISDN: Narrowband ISDN, Broadband ISDN. Medium Access Sub layer: Static and dynamic channel allocation, Multiple access protocols: ALOHA, CSMA, CSMA/CD, Collision Free protocol, Limited-contention protocols, WDMA.
Week-IV	Introduction to IEEE standards for LAN: Ethernet LAN (802.3), Token Bus (802.4), Token Ring (802.5), Wireless LAN(802.11, 802.15, 802.16) High speed LAN: FDDI, Fast Ethernet, Fibre channel.
Week –V	Data Link Layer: Design issues, Elementary data link protocols, sliding windows protocols.
Week-VI	Network Layer: Design Issues. Routing Algorithms –The optimality principle, Shortest path routing,
Week –VII	Flooding, flow based routing, distance vector routing, link state routing,
Week-VIII	Hierarchical routing, routing for mobile hosts, broadcast routing, multi cast routing.
Week –IX	Congestion Control – General principles, prevention policies, Traffic shaping, flow specification,
Week –X	congestion Control in virtual circuits, choke packets, load shedding, jitter control and congestion Control in multicasting.
Week –XI	Internet protocols: How networks differ, internetworking devices, virtual circuits, connectionless internetworking, IPv4 , IPv6.
Week-XII	Network Security: Security attacks and Preventions, Cryptography – principles, public key encryption and digital Signatures.

MS-125 Programming Lab-III (Based on MS-121)

Maximum Marks: 100*

Max. Time: 3 Hr

Minimum Pass Marks: 35%

Practical sessions to be conducted: 45-55

Course Objective: The purpose of this course is to introduce to students to the field of programming using C++ language.

Course Outcomes: After Completion of this course the student would be able:

CO1: To Read, understand and trace the execution of programs written in C++ language.

CO2: Write the C++ code for a given algorithm

This laboratory course will mainly comprise of exercise based on subject (MS-121 Object Oriented programming Using C++)

. Implementation and Execution of:

1. Defining variables and assigning values to variables.
2. Arithmetic and relational operators.
3. Arithmetic expressions and their evaluation
4. Formatting input/output using cin and cout.
5. Control Statements.
6. Array.
7. Strings.
8. Structures.
9. Pointers.
10. Classes and Objects.
11. Constructors.
12. Destructors .
13. Inheritance.
14. Polymorphism.
15. Operator overloading.
16. Function overloading.
17. Files and streams.

***Maximum Marks for Continuous Assessment: 30**

Maximum Marks for Semester Examination : 70

MS-126 Programming Lab-IV (Based on MS-123)

Maximum Marks: 100*

Max. Time: 3 Hrs.

Minimum Pass Marks: 35%

Practical sessions to be conducted: 45-55

This laboratory course will mainly comprise of exercise based on subject (MS-123 Java Script)

***Maximum Marks for Continuous Assessment: 30**

Maximum Marks for Semester Examination : 70

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