OUTLINES OF TESTS,

SYLLABI AND COURSES OF READINGS

FOR

MASTER IN INFORMATION TECHNOLOGY

MSc. IT (PART-II)

MSc.IT- IInd Year (III & IV Semester)

Session 2023-24 & 2024-25

MATA GUJRI COLLEGE

SRI FATEHGARH SAHIB-140406

OUTLINE OF PAPERS AND TESTS
MSc. IT -II (THIRD SEMESTER) EXAMINATIONS
Sessions 2023-24 &2024-25

Code	Title of Paper	Schedule of Teaching (Hours/Week)			Total Hours	Credits	Marks	
		L	T	P			External	Internal
MS-231	Software Engineering	4	0	0	4	4	70	30
MS-232	Data Structures	4	0	0	4	4	70	30
MS-233	Programming in JAVA	4	0	0	4	4	70	30
MS-234	Artificial Intelligence	4	0	0	4	4	70	30
MS-235	Programming Lab-V based on MS-232 (Data Structures)	0	0	6	6	3	70	30
MS-236	Programming Lab-VI based on MS-233 (JAVA)	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-231 Software Engineering

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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

Course Objectives: Describe software engineering layered technology and Process frame work and the role of project management including planning, scheduling, risk management, etc.

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

CO1. Basic knowledge and understanding of the analysis and design of complex systems.

CO2. Ability to apply software engineering principles and techniques.

CO3. Ability to develop, maintain and evaluate large-scale software systems.

CO4. To produce efficient, reliable, robust and cost-effective software solutions.

Unit-I

Introduction to Software Engineering: Origin, Definition and goals of Software Engineering. Comparison with traditional Engineering Disciplines. **Software development process**, Process Models: Waterfall, Spiral, Prototype. Error distribution, Effort distribution, Role of metrics and measurements. **Software Project Planning**: Planning activities, Team structure (Democratic, Chief-programmer, Hierarchical). **Software Requirement Specification:** Role, characteristics and components of SRS. Problem Analysis: Structuring Information, DFD and Data Dictionary.

Unit-II

Software Design: Design Objectives and principles, Design concepts – Abstraction, Information hiding, Concurrency, Modularity. **Coupling-Cohesion criteria**. Structured design methodology. Design specification, Metrics**,** Coding, Structured coding techniques: Data Encapsulation, Go to statement, Recursion, Single Entry Single Exit criteria. Structured programming.

Testing fundamentals: Error, Fault, Failure and Reliability, Levels of testing, Test case and Test criteria, Top-down and bottom-up approach, Test case execution and analysis, Test report. **Software maintenance:** The nature of maintenance, maintenance problems, maintenance techniques and tools. Software re-engineering, reverse engineering and forward engineering

Text books:

1. An Integrated Approach to Software Engineering by P.Jalote, Narosa Publications.

Reference:

1.Fundamentals of Software Engineering by Carlo Ghezzi, Mehdi Jazayeri,Dino Mandrioli,Pearson Education,2nd Edition.

2. Software Engineering: Theory and Practice by Shari Lawrence Pfleeger, Pearson Education, 2nd Edition.

3. Software Engineering-A practitioner's Approach by Roger.S.Pressman, McGraw-Hill, and 3rd Edition.

Teaching Plan

Week-I	Introduction to Software Engineering: Origin, Definition and goals of Software Engineering. Comparison with traditional Engineering
Week-II	Disciplines. Software development process, Process Models: Waterfall, Spiral, Prototype.
Week –III	Software Project Planning: Planning activities, Team structure (Democratic, Chief-programmer, Hierarchical).
Week-IV	Error distribution, Effort distribution, Role of metrics and measurements.
Week –V	Software Requirement Specification: Role, characteristics and components of SRS.)
Week-VI	Problem Analysis: Structuring Information, DFD and Data Dictionary.
Week –VII	Software Design: Design Objectives and principles, Design concepts – Abstraction, Information hiding, Concurrency, Modularity.
Week-VIII	Coupling-Cohesion criteria. Structured design methodology. Design specification, Metrics,
Week –IX	Coding, Structured coding techniques: Data Encapsulation, Go to statement, Recursion, Single Entry Single Exit criteria. Structured programming
Week –X	Testing fundamentals: Error, Fault, Failure and Reliability, Levels of testing, Test case and Test criteria, Top-down and bottom-up approach, Test case execution and analysis, Test report
Week –XI	Software maintenance: The nature of maintenance, maintenance problems, maintenance techniques and tools.
Week –XII	Software re-engineering, reverse engineering and forward engineering

MS-232 Data Structure

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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 II is compulsory.
2. Use of non-programmable scientific calculator is allowed

Course Objectives: To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms

C**ourse Outcomes**: After the completion of this course, the students will be able:

CO1. Describe how arrays, records, linked structures, stacks; queues, trees, and graphs are represented in memory and used by algorithms

CO2. Discuss the computational efficiency of the principal algorithms for sorting, searching

UNIT – I

Data Structure: Introduction to data structure and algorithm, complexity of an algorithm. Algorithm analysis: Time space trade off, Big O notation, Algorithmic notations & Complexity.

Arrays: Introduction, one dimensional and multidimensional array, memory representation of arrays, Operations on arrays: Insertion, Deletion, searching, sorting.

Stacks: Introduction, Operation on stacks, Implementation of stacks, Application of stacks: evaluation of arithmetic expressions, Parenthesis matching, String Reversal, Polish & Reverse Polish Notation.

Queues: Introduction, operation on queues, circular queue, memory representation of queues, Dequeues, Priority queues, application of queues.

UNIT – II

Linked List: Introduction to operation on linked list, circular linked list, doubly linked list, header linked list, implementation of linked list, application of linked lists.

Trees: Introduction to Trees, Binary Tree; Binary Search Tree, Heaps: Insertion and Deletion.

Searching: Linear search, Binary Search.

Sorting: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Shell Sort, Radix Sort, and Quicksort.

Text Book:

1. Data Structures using C by Seymour Lipschultz , McGraw-Hill.

2. Data Structures Using C by A.M. Tanenbaum, Y. Lanhgsam and M.J. Augenstein, Prentice Hall of India.

References:

1. Theory and Problems of Data Structures by Seymour Lipschultz, McGraw-Hill.

2. Data Structures with Pascal by E. Horowitz and S. Sahni, Galgotia, 3rd Edition,

3. Algorithms in C by Robert Sedgewick, Pearson Education.

Teaching Plan

Week-I	Data Structure: Introduction to data structure and algorithm, complexity of an algorithm.
Week-II	Algorithm analysis: Time space trade off, Big O notation, Algorithmic notations & Complexity.
Week –III	Arrays: Introduction, one dimensional and multidimensional array, memory representation of arrays
Week-IV	Operations on arrays: Insertion, Deletion, searching, sorting.
Week –V	Stacks: Introduction, Operation on stacks, Implementation of stacks, Application of stacks: evaluation of arithmetic expressions
Week-VI	Parenthesis matching, String Reversal, Polish & Reverse Polish Notation.
Week –VII	Queues: Introduction, operation on queues, circular queue, memory representation of queues, Dequeues, Priority queues, application of queues.
Week-VIII	Linked List: Introduction to operation on linked list, circular linked list.
Week –IX	Doubly linked list, header linked list, implementation of linked list, application of linked lists
Week –X	Trees: Introduction to Trees, Binary Tree; Binary Search Tree, Heaps: Insertion and Deletion.
Week –XI	Searching: Linear search, Binary Search.
Week –XII	Sorting: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Shell Sort, Radix Sort, And Quick Sort

MS-233 Programming in Java

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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

Course Objectives: programming in the Java programming language. Knowledge of object-oriented paradigm in the Java programming language,

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

CO1. Java programming and the basic concepts of object-oriented programming.

CO2. Identify Java code utilities in Arrays, Strings and Vectors and classes**.**

CO3. Write Java code using Java features.

UNIT –I

Introduction to Java: evolution, features, comparison with C and C++; Java program structure; tokens, keywords, constants, variables, data types, type casting, statements.

Operators and expressions: arithmetic, relational, logical, assignment, increment, decrement, conditional, bitwise and special operators. Operator precedence & associativity rules.

Control statements: if else, switch case, for, while, do while, break, continue, labeled loops.

Class: syntax, instance variable, class variables, methods, constructors, overloading of constructors and methods.

UNIT –II

Inheritance: types of inheritance, use of super, method overriding, final class, abstract class, wrapper classes.

Arrays, Strings and Vectors, Packages and Interfaces, visibility controls Errors

Exceptions: Types of errors, Exception classes, Exception handling in java, use of try, catch, finally, throw and throws. Taking user input, Command line arguments.

Multithreaded Programming: Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication.

Text books:

1. The Complete Reference Java 2 by Patrick Naughton and Herbert Schildt,Tata McGraw Hill.

References:

1. Java Programming Language by Ken Arnold, James Gosling, David Holmes, Pearson Publications, 3rd Edition.

2. Infosys Campus Connect Foundation Program Volume: 1 – 3, Education & Research Department, Infosys Technologies Ltd, Bangalore.

3. Practical java project for beginners by B.M.Harwani

Teaching Plan

Week-I	Introduction to Java: evolution, features, comparison with C and C++;
Week-II	Java program structure; tokens, keywords, constants, variables, data types, type casting, statements
Week –III	Operators and expressions: arithmetic, relational, logical, assignment, increment, decrement, conditional,
Week-IV	Bitwise and special operators. Operator precedence & associativity rules. .
Week –V	Control statements: if else, switch case, for, while, do while, break, continue, labeled loops
Week-VI	Class: syntax, instance variable, class variables, methods, constructors, overloading of constructors and methods.
Week –VII	Inheritance: types of inheritance, use of super, method overriding,
Week-VIII	Final class, abstract class, wrapper classes.
Week –IX	Arrays, Strings and Vectors, Packages and Interfaces, visibility controls Errors
Week –X	Exceptions: Types of errors, Exception classes, Exception handling in java,
Week –XI	Use of try, catch, finally, throw and throws. Taking user input, Command line arguments.
Week –XII	Multithreaded Programming: Creating Threads, Life cycle of thread, Thread priority, Thread synchronization, Inter-thread communication

MS-234Artificial Intelligence

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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

Course Objectives: The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence.

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

CO1. Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.

CO2. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.

Unit-I

Introduction to AI: Definitions, Basic Elements of AI, Application Areas.

Prepositional Logic: Syntax and semantics of Preposition Logic.

First Order Predicate Logic: Syntax and Semantics, Clausal form, Inference rules, Unification, resolution,

Knowledge Based Systems: Meaning of Knowledge, Types of Knowledge, procedural vs. declarative knowledge. Components of Knowledge Base System.

Knowledge Representation: Approaches to Knowledge representation, Issues in Knowledge representation, Knowledge representation using rules. Semantic Nets, Frames, Conceptual Dependencies, Scripts.**Knowledge Acquisition**: Definition, General Learning Model, Types of Learning, Factors affecting Learning. Knowledge organization & Manipulation: Introduction, Issues in organization and manipulation.

Unit-II

Expert systems: Basic Components & architecture of Expert systems, representing and using domain knowledge, ES-Shells.
Natural language processing: Features of natural language, Steps in Natural Language Processing, Syntactic processing – Grammar and Parsers, Semantic analysis – Semantic grammars, discourse and pragmatic processing

Text Books:

1. Introduction to Artificial Intelligence and Expert Systems by Dan W. Patterson, Prentice-Hall.

2. Artificial Intelligence by E. Rich and K. Knight, Tata McGraw Hill.

References:

1. Introduction to artificial Intelligence by E. Charnaik and D. McDermott, Addison-Wesley Publishing Company.

2. Principles of Artificial Intelligence by Nils J. Nilson, Narosa Publishing Co.

3. Expert Systems for Personal Computers by M. Chandwick and J.A. Hannah, Galgotia Publications Pvt. Lt

Teaching Plan

Week-I	Introduction to AI: Definitions, Basic Elements of AI, Application Areas. Prepositional Logic: Syntax and semantics of Preposition Logic.
Week-II	First Order Predicate Logic: Syntax and Semantics, Clausal form, Inference rules, Unification, resolution,
Week –III	Knowledge Based Systems: Meaning of Knowledge, Types of Knowledge procedural vs. declarative knowledge. Components of Knowledge Base System.
Week-IV	Knowledge Representation: Approaches to Knowledge representation,
Week –V	Issues in Knowledge representation, Knowledge representation using rules. Semantic Nets, Frames, Conceptual Dependencies, Scripts...
Week-VI	Knowledge Acquisition: Definition, General Learning Model, Types of Learning, Factors affecting Learning. Knowledge organization & Manipulation: Introduction, Issues in organization and manipulation.
Week –VII	**Expert systems:** Basic Components &architecture of Expert systems,
Week-VIII	Representing and using domain knowledge, ES-Shells.
Week –IX	Natural language processing: Features of natural language
Week –X	Steps in Natural Language Processing, Syntactic processing – Grammar and Parsers,
Week –XI	Semantic analysis – Semantic grammars,
Week –XII	Discourse and pragmatic processing

MS-235 -Programming Lab-V based on MS-232

Maximum Marks: 100 **Lectures to be delivered: 45-55**
Minimum Pass Marks: 35 % **Time allowed: 3 Hrs.**

Course Objectives: To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms

C**ourse Outcomes**: After the completion of this course, the students will be able:

CO1. Describe how arrays, records, linked structures, stacks; queues, trees, and graphs are represented in memory and used by algorithms

CO2. Discuss the computational efficiency of the principal algorithms for sorting, searching

This laboratory course will mainly comprise of exercise based on subject MS-**232**

The distribution of marks is as under:-

- Maximum Marks for Continuous Assessment : 30
- Maximum Marks for Semester Examination : 70

MS-236 -Programming Lab-V based on MS-233

Maximum Marks: 100 **Lectures to be delivered: 45-55**
Minimum Pass Marks: 35 % **Time allowed: 3 Hrs.**

Course Objectives: programming in the Java programming language. Knowledge of object-oriented paradigm in the Java programming language,
Course Outcomes: After the completion of this course, the students will be able:
CO1. Java programming and the basic concepts of object-oriented programming.
CO2. Identify Java code utilities in Arrays, Strings and Vectors and classes**.**
CO3. Write Java code using Java features.

This laboratory course will mainly comprise of exercise based on subject MS-**233**

The distribution of marks is as under:-

- Maximum Marks for Continuous Assessment : 30
- Maximum Marks for Semester Examination : 70

OUTLINE OF PAPERS AND TESTS

MSc. IT -II (FOURTH SEMESTER) EXAMINATIONS
Session Year 2023-24 &2024-25

Code	Title of Paper	Schedule of Teaching (Hours/Week)			Total Hours	Credits	Marks	
		L	T	P			External	Internal
MS-241	E-Commerce Technologies	4	0	0	4	4	70	30
MS-242	Computer Graphics	4	0	0	4	4	70	30
MS-243	Web Development using PHP	4	0	0	4	4	70	30
MS-244	Cloud Computing	3	0	1	4	4	70	30
MS-245	Programming Lab-VII based on MS-242 (Computer Graphics)	0	0	6	6	3	70	30
MS-246	Programming Lab-VIII Project based on MS-243**)** (PHP)	0	0	6	6	3	70	30
	Total	15	0	13	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-241 E-Commerce Technologies

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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

Course Objectives: Focuses on the three major driving forces that permeate all aspects of e-commerce: business development and strategy, technological innovations, and social and legal issues and impacts.

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

- **CO1**. Analyze the impact of E-commerce on business models and strategy.
- **CO2**. Describe the major types of E-commerce.
- **CO3**. Explain the process that should be followed in building an E-commerce presence.

UNIT-I

Introduction to E-commerce: Definition of E-commerce, Advantages and disadvantages of E-commerce Ecommerce versus traditional commerce. Internet and WWW, Electronic commerce framework, Electronic commerce and media convergence, the anatomy of E-commerce applications.

Architectural framework for E-commerce, World Wide Web as the architecture**,** Web background: Hypertext publishing, Security and the Web. Consumer-oriented E-commerce: Consumer-oriented applications, Mercantile Process Models – consumer's perspective, Merchant's perspective.

UNIT-II

Advertising and Marketing on the Internet: The new age information based marketing, Advertising on the Internet – Active or push-based advertising models, Passive or pull-based advertising models. Guidelines for Internet advertising.

Online marketing process: Introduction to Mobile-commerce Types of Electronic Payment Systems, Digital token-based electronic payment systems, Smart cards and electronic payment systems, Credit card-based electronic payment systems, Risk and electronic payment systems. Electronic Data Interchange and its applications in business. Legal, Ethical and other public policy issues related to e-commerce.

Text Book:

Ravi Kalakota, Andrew B. Whinston: Frontiers of Electronic Commerce, Addison Wesley.

Reference Books:

1.Efraim Turbon, Jae Le, David King, Chung: Electronic Commerce- A managerial perspective, Prentice-Hall International.

Teaching Plan

Week-I	Introduction to E-commerce: Definition of E-commerce, Advantages and disadvantages of E-commerce,
Week-II	Ecommerce versus traditional commerce. Internet and WWW, Electronic commerce framework
Week –III	Electronic commerce and media convergence, The anatomy of E-commerce applications.
Week-IV	Architectural framework for E-commerce, World Wide Web as the architecture,
Week –V	Web background: Hypertext publishing, Security and the Web. Consumer-oriented E-commerce: Consumer-oriented applications
Week-VI	Mercantile Process Models – consumer's perspective, Merchant's perspective.
Week –VII	Advertising and Marketing on the Internet: The new age information based marketing, ,
Week-VIII	Advertising on the Internet – Active or push-based advertising models,
Week –IX	Passive or pull-based advertising models. Guidelines for Internet advertising.
Week –X	Online marketing process: Introduction to Mobile-commerce Types of Electronic Payment Systems,
Week –XI	Digital token-based electronic payment systems, Smart cards and electronic payment systems, Credit card-based electronic payment systems,
Week –XII	Risk and electronic payment systems. Electronic Data Interchange and its applications in business. Legal, Ethical and other public policy issues related to e-commerce.

MS-242 Computer Graphics

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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

Course Objectives: To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.

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

CO1. To list the basic concepts used in computer graphics

CO2. To implements various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.

CO3. To describe the importance of viewing and projections

UNIT-I

Functioning of Input devices: Keyboard, Touch panel, Light pens, Graphic tablets, Joysticks, Data glove, Image scanner, Mouse. **Functioning of Output devices:** Impact and non-impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters. **Functioning of Video Display Devices:** Refresh cathode ray tube, raster scan displays, random scan displays, color CRT monitors, DVST, flat-panel displays, virtual reality, raster scan systems, Frame buffer and video controller. **Scan conversion algorithms** for line, circle and ellipse, Bresenham's algorithms, area filling techniques.

UNIT-II

2-d Graphics: 2-dimensional Geometric transformations(translation, Scaling, Rotation, Reflection, Shearing), Viewing transformation, 2D clipping algorithms (Cohen Sutherland and Liang Barsky's line clipping algorithms), polygon and text clipping.

3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Composite transformations, Mathematics of Projections (parallel & perspective), 3-D viewing transformations and clipping.

Text books:

1. Computer Graphics by D. Hearn and M.P. Baker, PHI, 4th Edition.

References:

1. Introduction to Computer Graphics byJ.D. Foley, A.V. Dam, S.K. Feiner, J.F. Hughes, R.L Phillips, and Addison-Wesley Publishing Company, N.Y., 2nd Edition.

2. Computer Graphics by R.A. Plastock and G. Kalley, McGraw Hill.

Teaching Plan

Week-I	Functioning of Input devices: Keyboard, Touch panel, Light pens, Graphic tablets, Joysticks, Data glove, Image scanner, Mouse. .
Week-II	Functioning of Output devices: Impact and non-impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters.
Week –III	Functioning of Video Display Devices: Refresh cathode ray tube, raster scan displays, random scan displays
Week-IV	color CRT monitors, DVST, flat-panel displays, virtual reality, raster scan systems, Frame buffer and video controller
Week –V	Scan conversion algorithms for line, circle and ellipse,
Week-VI	Bresenham's algorithms, area filling techniques.
Week –VII	2-d Graphics: 2-dimensional Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing),.
Week-VIII	Viewing transformation, 2D clipping algorithms (Cohen Sutherland and Liang Barsky's line clipping algorithms),
Week –IX	polygon and text clipping
Week –X	3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing,
Week –XI	Composite transformations, Mathematics of Projections (parallel & perspective),
Week –XII	3-D viewing transformations and clipping...

MS-243 Web Development using PHP

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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

Course Objectives: Introduction to the open source Web scripting language PHP. Build dynamic Web applications. Semantics and syntax of the PHP language, including discussion on the practical problems that PHP solves.

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

CO1. Write PHP scripts to handle HTML forms.
CO2 Write regular expressions including modifiers, operators
CO3. Create PHP programs that use various PHP library functions, and that manipulate files and directories.

UNIT-I

PHP: A Brief History of PHP, Introduction to PHP, Syntax, **And Scope of Variables**: Global and Local Variables, Data types, Control Statements, **Operators-** Arithmetic, Logical, Relational and Bit-Wise operators.

Functions, JavaScript functions Local and Global scope, Calling Functions, Defining a Function, Built-in functions.

Installing and Configuring PHP on Windows. Installing web site on web server-Apache, WAMP.

Arrays: Creating Arrays, Multidimensional Arrays, Cookies. Document Object Model and Finding Elements. Basic Events, Standard Event Model.

Quoting String Constants - Printing Strings - Accessing Individual Characters -Cleaning Strings - Encoding and Escaping -Comparing Strings - Manipulating and Searching Strings – Regular Expressions.

UNIT-II

Connecting to MySQL from PHP. Server side programming, Client Side Scripting, WAMP tool, HTML Form Fields (Controls), PHP Form Handling, Form Validations.

Objects: Terminology - Creating an Object - Accessing Properties and Methods - Declaring a Class - Introspection – Serialization Extending PHP. **AJAX:** Introduction, Identifiers, Variables, Defined Constants, Operators and Expressions.HTML Form Fields (Controls).

Architectural Overview: The pval/zval Data Type, Parameter Handling, Returning Values, References, Global Variables. **Introduction to MySqli** , Data Types, Sql Queries: Creating Database, Creating Table, Inserting, Updating, Deleting Data, Searching, Sorting, Altering table.

Textbooks:

1. PHP and MYSQL web development by Luke welling and Laura Thomson, 4th Edition.

References:

1. PHP4: A Beginner's Guide by Bill McCarty,McGraw-Hill.
2. PHP5.1 for Beginners by Ivan Bross,Shroff Publishers.

Teaching Plan

Week-I	PHP: A Brief History of PHP, Introduction to PHP, Syntax,
Week-II	Scope of Variables: Global and Local Variables, Data types, Control Statements
Week –III	Operators- Arithmetic, Logical, Relational and Bit-Wise operators.
Week-IV	Functions, JavaScript functions Local and Global scope, Calling Functions, Defining a Function, Built-in functions.
Week –V	Installing and Configuring PHP on Windows. Installing web site on web server-Apache, WAMP
Week-VI	Arrays: Creating Arrays, Multidimensional Arrays, Cookies. Document Object Model and Finding Elements. Basic Events, Standard Event Model
Week –VII	Quoting String Constants - Printing Strings - Accessing Individual Characters -Cleaning Strings - Encoding and Escaping -Comparing Strings - Manipulating and Searching Strings – Regular Expressions.
Week-VIII	Connecting to MySQL from PHP. Server side programming, Client Side Scripting, WAMP tool, HTML Form Fields (Controls), PHP Form Handling, Form Validations.
Week –IX	Objects: Terminology - Creating an Object - Accessing Properties and Methods - Declaring a Class - Introspection – Serialization Extending PHP.
Week –X	AJAX: Introduction, Identifiers, Variables, Defined Constants, Operators and Expressions.HTML Form Fields (Controls).
Week –XI	Architectural Overview: The pval/zval Data Type, Parameter Handling, Returning Values, References, Global Variables
Week –XII	Introduction to MySqli , Data Types, Sql Queries :Creating Database, Creating Table, Inserting, Updating, Deleting Data, Searching, Sorting, Altering table

MS-244 Cloud Computing

Maximum Marks: 100 **Maximum Time: 3HRS**

Internal Assessment: 30 **Lectures to be delivered: 45-55**

External Examination: 70

Minimum Pass Marks: 35%

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

Course Objectives: To understand the basics of Cloud Computing and the movement from a traditional network infrastructure to a Cloud solution

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

CO1. Understand the core concepts of the cloud computing paradigm

CO2. Analyse various cloud computing service and deployment models and apply them to solve problems on the cloud

CO3. Implementation of various security strategies for different cloud platform

UNIT-I

Introduction : Definition of cloud, characteristics of cloud, historical developments & challenges ahead, the vision of cloud computing, Driving factors towards cloud, Comparing grid with utility computing, cloud computing and other computing systems, types of workload patterns for the cloud, IT as a service, Applications of cloud computing.

Cloud computing concepts: Introduction to virtualization techniques, Characteristics of virtualization, Pros and Cons of virtualization Technology, Hypervisors, Types of hypervisors, Multitenancy, Application programming interfaces (API), Elasticity and scalability.

UNIT-II

Cloud service models: Cloud service models, Infrastructure as a service (IaaS) architecture- details and example, Platform as a service (PaaS) architecture- details and example, Software as a service (SaaS) architecture-- details and example, Comparison of cloud service delivery models.

Cloud deployment models: Introduction to cloud deployment models, Public clouds, Private clouds, Hybrid clouds, Community clouds, Migration paths for cloud, Selection criteria for cloud deployment.

Security in cloud computing: Understanding security risks, Principal security dangers to cloud computing, Internal security breaches, User account and service hijacking, measures to reduce cloud security breaches Case Studies: Comparison of existing Cloud platforms /Web Services

Text Books: 1. Michael Miller, Cloud Computing, 2008.

2. Judith Hurwitz, Robin Bllor, Marcia Kaufman, Fern Halper, Cloud Computing for dummies, 2009. 3. Sosinsky Barrie, "Cloud Computing: Bible", Wiley Publication, 2011.

Reference Book:

1. Raj Kumar Buyya, James Broberg, Andrezei M.Goscinski, Cloud Computing: Principles and paradigms, 2011

Teaching Plan

Week-I	**Introduction** : Definition of cloud, characteristics of cloud, historical developments & challenges ahead, the vision of cloud computing
Week-II	Driving factors towards cloud, Comparing grid with utility computing.
Week –III	Cloud computing and other computing systems, types of workload patterns for the cloud, IT as a service, Applications of cloud computing
Week-IV	**Cloud computing concepts**: Introduction to virtualization techniques, Characteristics of virtualization.
Week –V	Pros and Cons of virtualization Technology, Hypervisors, Types of hypervisors
Week-VI	Multitenancy, Application programming interfaces (API), Elasticity and scalability.
Week –VII	**Cloud service models**: Cloud service models, Infrastructure as a service (IaaS) architecture- details and example, Platform as a service (PaaS) architecture- details and example, Software as a service (SaaS) architecture details and example.
Week-VIII	Comparison of cloud service delivery models. **Cloud deployment models**: Introduction to cloud deployment models, Public clouds, Private clouds, Hybrid clouds, Community clouds.
Week –IX	Migration paths for cloud, Selection criteria for cloud deployment.
Week –X	**Security in cloud computing**: Understanding security risks, Principal security dangers to cloud computing.
Week –XI	Internal security breaches, User account and service hijacking, measures to reduce cloud security breaches.
Week –XII	Case Studies: Comparison of existing Cloud platforms /Web Services.

MS-245 Programming Lab VII based on paper MS-242

Maximum Marks: 100 **Practical Unites to be conducted: 45-55**
Minimum Pass Marks: 35 % **Time allowed: 3 Hrs.**

Course Objectives: To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.

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

CO1. To list the basic concepts used in computer graphics

CO2. To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.

CO3. To describe the importance of viewing and projections

This laboratory course will mainly comprise of exercises based on paper MS-242

*The distribution of marks is as under

- **Maximum Marks for Continuous Assessment: 30**
- **Maximum Marks for Semester Examination: 70**

MS-246 -Programming Lab-VIII based on MS-243

Maximum Marks: 100 **Practical Unites to be conducted: 45-55**
Minimum Pass Marks: 35 % **Time allowed: 3 Hrs.**

Course Objectives: Introduction to the open source Web scripting language PHP. Build dynamic Web applications. Semantics and syntax of the PHP language, including discussion on the practical problems that PHP solves.

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

CO1. Write PHP scripts to handle HTML forms.

CO2 Write regular expressions including modifiers, operators

CO3. Create PHP programs that use various PHP library functions, and that manipulate files and directories.

This laboratory course will mainly comprise of Minor Project based on paper MS-243

.

*The distribution of marks is as under

- Maximum Marks for Continuous Assessment : 30
- Maximum Marks for Semester Examination : 70