Gayatri Vidya Parishad College for Degree and PG Courses (AUTONOMOUS)

Department of Computer Sciences

MASTER OF COMPUTER APPLICATIONS

Course Structure and Scheme of Examination w.e.f 2016-17

I Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA1.1.1	Fundamental Programming Methodologies	4	--	70	30	100	4
MCA1.1.2	Computer Organization	4	--	70	30	100	4
MCA1.1.3	Discrete Mathematical Structures	4	--	70	30	100	4
MCA1.1.4	Probability Statistics and Queuing Theory	4	--	70	30	100	4
MCA1.1.5	Accounting and Finance Management	4	--	70	30	100	4
MCA1.1.6	Programming Methodologies Lab	--	3	50	50	100	2
MCA1.1.7	Computer Organization Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**24**

II Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA1.2.1	Object Oriented Programming Using Java	4	--	70	30	100	4
MCA1.2.2	Data Structures Using Java	4	--	70	30	100	4
MCA1.2.3	Operating Systems	4	--	70	30	100	4
MCA1.2.4	Elective – I : i) System Programming ii) File Structures iii) Information System & Organizational Behavior iv) Formal Languages and Automata Theory	4	--	70	30	100	4
MCA1.2.5	Ecology and Environment	4	--	70	30	100	4
MCA1.2.6	Data Structures Using Java Lab	--	3	50	50	100	2
MCA1.2.7	Operating Systems Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**24**

III Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA2.1.1	Computer Graphics	4	--	70	30	100	4
MCA2.1.2	Database Management Systems	4	--	70	30	100	4
MCA2.1.3	Artificial Intelligence	4	--	70	30	100	4
MCA2.1.4	Operation Research	4	--	70	30	100	4
MCA2.1.5	Elective – II: i) Design & Analysis of Algorithms ii) Software Engineering iii) Embedded Systems iv) Compiler Design	4	--	70	30	100	4
MCA2.1.6	Graphics and Multimedia Lab	--	3	50	50	100	2
MCA2.1.7	Database Management Systems Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**24**

IV Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA2.2.1	Web Technologies	4	--	70	30	100	4
MCA2.2.2	Object Oriented Analysis and Design with UML	4	--	70	30	100	4
MCA2.2.3	Data Communications and Computer Networks	4	--	70	30	100	4
MCA2.2.4	Elective – III: i) Bio-Informatics ii) Image Processing iii) E-Commerce Technologies iv) Distributed Systems	4	--	70	30	100	4
MCA2.2.5	MOOCS-I	4	--	70	30	100	2
MCA2.2.6	Web Technologies Lab	--	3	50	50	100	2
MCA2.2.7	Data Communications and Computer Networks Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**22**

V Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA3.1.1	Network Security	4	--	70	30	100	4
MCA3.1.2	Data Warehousing and Mining	4	--	70	30	100	4
MCA3.1.3	Dot Net Technologies	4	--	70	30	100	4
MCA3.1.4	Elective IV: i) Big Data Analytics ii) Cloud Computing iii) Mobile Computing iv) Wireless Ad-hoc Networks	4	--	70	30	100	4
MCA3.1.5	MOOSC-II	--	--	--	--	100	4
MCA3.1.6	Data Mining and Warehousing Lab	--	3	50	50	100	2
MCA3.1.7	Dot Net Technologies Lab	--	3	50	50	100	2
Total		**16**	**6**	**450**	**250**	**700**	**24**

VI Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA3.2	Project	--	--	50	50	100	14
Total		--	--	**50**	**50**	**100**	**14**

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
Total (Complete Course)		**96**	**30**	**2230**	**1270**	**3600**	**132**

Syllabi

With effect from 2016-17 admitted batch

Chairman

Board of Studies

(2016-17)

Department of Computer Sciences

Gayatri Vidya Parishad College for Degree and PG Courses(A)

Affiliated to Andhra University

Visakhapatnam

MASTER OF COMPUTER APPLICATIONS

Syllabi

With effect from 2016-17 admitted batch

I YEAR I SEMESTER

I Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA1.1.1	Fundamental Programming Methodologies	4	--	70	30	100	4
MCA1.1.2	Computer Organization	4	--	70	30	100	4
MCA1.1.3	Discrete Mathematical Structures	4	--	70	30	100	4
MCA1.1.4	Probability Statistics and Queuing Theory	4	--	70	30	100	4
MCA1.1.5	Accounting and Finance Management	4	--	70	30	100	4
MCA1.1.6	Programming Methodologies Lab	--	3	50	50	100	2
MCA1.1.7	Computer Organization Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**24**

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester I

MCA1.1.1: FUNDAMENTAL PROGRAMMING METHODOLOGIES

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:		
1. To discuss basics of algorithms and Flowcharts. 2. To study about control statements and looping statements 3. To discuss about the pointer and functions and usage files. 4. To discuss various features of object-oriented programming.		
	SYLLABUS	
Unit I:		
Definition of algorithms and Flowcharts - C character set - operators and their priority - Input and output in C - if statement - if else statement - various forms of if - break statement - continue - switch statement - for statement - while statement do while statement - arrays - working with string and standard functions.		
Unit II:		
Introduction to pointers - pointer declaration - arithmetic operations with pointers - pointers and arrays - pointers to pointers - pointers and strings - void pointers - Functions - types of functions - call by value and reference - functions returning more values - recursion - pointer to function.		
Unit III:		
C storage classes - Preprocessor directives - structures and unions - bit wise operators - files - command line arguments - dynamic memory allocation.		
Unit IV:		
Basic Concepts of object-oriented programming using C++ - Basic data types in C++.Function overloading - default arguments - inline functions - Examples with classes and objects - array of objects - static data and member functions – constructors and destructors - copy constructor - deriving base class constructors - operator overloading - friend functions.		
Unit V:		
Inheritance and access specifiers - types of inheritance - pointer to objects - this pointer - memory management operators - virtual base classes - virtual functions and runtime polymorphism - Abstract classes - C++ Console I/O functions - C++ Files - Simple Examples for Class and Function Templates - Exception Handling.		
Outcomes:		
At the end of the course students will be able to 1. Understand the basicconstructs of ‘C’ language. 2.Attain the knowledge of pointers and functions in ‘C’ language. 3.Apply the functionality of various C storage classes in programming. 4.Acquire knowledge of object orientation concepts and basic programming constructs in C++. 5. Procure in depth knowledge of inheritance, polymorphism, templates and exception handling in object orientated C++.		
Text Book:		
1) Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson Education, New Delhi. 2) Object Oriented Programming using C++, E. Balagurusamy, 5thEdition, McGraHill.		

References:		
1. N. G. Venkateshmurthy, Programming techniques through C, Pearson Education, New Delhi. 2. R. G. Dromey, How to Solve it by Computer, Prentice Hall of India Ltd, New Delhi. Dreamtech publications, New Delhi. 3. Object Oriented Programming using C++, Ira Pohl, Pearson Education. 4. Object Oriented Programming in C++, Robert Lafore, PHI Publication.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester I

MCA1.1.2: COMPUTER ORGANIZATION

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:		
1. To study about structure and functional components of a computer. 2. Understanding the hierarchical organization of a computer system which consists of instruction set of commands. 3. Learn about the architecture of a computer from a programming view. 4. To design a balance system that minimizes performance and utilization of all elements.		
	SYLLABUS	
Unit I:		
Data Representation: Data Types, Complements, Fixed-Point Representation, Floating-Point Representation, Other Binary Codes, Error Detection Codes. (Chapter3, Text 1) **Computer Arithmetic**: Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating Point Arithmetic Operations, Decimal Arithmetic Unit- Operations. (Chapter 10, Text 1)		
Unit II:		
Digital Logic Fundamentals: Boolean Algebra, Basic Combinatorial Logic, More Complex Combinatorial Components, Combinatorial Circuit Designs, Basic Sequential Components, More Complex Sequential Components, Programmable Logic Devices. (Chapter 1,Text 2) **Instruction Set Architectures**: Levels of Programming Languages, Assembly Language Instructions, Instruction Set Architecture Design, A Relatively Simple Instruction Set Architecture, The 8085 Microprocessor Instruction Set Architecture. (Chapter 3,Text 2)		
Unit III:		
Introduction to Computer Organization: Basic Computer Organization, CPU organization, Memory Subsystem Organization and Interfacing, I/O Subsystem Organization and Interfacing, A Relatively Simple Computer, An 8085-based Computer. (Chapter 4, Text 2) **Register Transfer Languages:** Micro-operations and Register Transfer Language, Using RTL to Specify Digital Systems, More Complex Digital Systems and RTL, VHDL-VHSIC Hardware Description Language. (Chapter 5, Text 2)		
Unit IV:		
CPU Design: Specifying a CPU, Design a Very Simple CPU, Implementation of a Very Simple CPU Internal Architecture of the 8085 Microprocessor. (Chapter 6, Text 2) **Micro-sequence Control Unit Design**: Basic Micro sequencer Design, Design a Very Simple Micro sequencer, Implementation of a Very Simple Micro sequencer, Micro programmed Control vs. Hardwired Control. (Chapter 7, Text 2)		
Unit V:		
Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA). (Chapter 11, Text 1) **Memory Organization:** Memory Hierarchy, Main Memory, Auxiliary Memory, Associate Memory, Cache Memory. (Chapter 12, Text 1)		
Outcomes:		

1. Understands about data representation and computer arithmetic.
2. Acquires knowledge on Boolean Algebra and 8085 instruction set architecture.
3. Understands the basics of computer organization.
4. Ability to understand and design CPU of a computer.
5. Ability to analyze the input and output organization of a computer.

Text Book:		

1. Computer System Architecture, M. Morris Mano, Third Edition, Pearson Education, 2007.
2. Computer Systems Organization & Architecture, John D. Carpinelli, Pearson Education, 2001

References:		

1) Digital Logic and Computer Organization, V.Rajaraman and T.Radhakrishnan, PHI Publication, 2006.
2) Computer Organization – Car Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGrawHill.
3) Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int.Edition.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester I

MCA 1.1.3: DISCRETE MATHEMATICAL STRUCTURES

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contrapositives using truth tables and the properties of logic.
2. Solve problems using Set Laws, Operations and properties of relations, Functions and Types of functions and Recursive Functions.
3. Solve counting problems by applying elementary counting techniques using the product and sum rules, permutations, combinations, the pigeon-hole principle, and binomial expansion.
4. Definition and identify different types of Graphs, Trees and Minimal spanning trees and Tree traversal Algorithms.

SYLLABUS

Unit I:

Mathematical Logic: Statements -connectives and Truth Tables-Tautology and contradiction -Logical Equivalence, Laws of Logic- Duality-Connectives NAND and NOR forms-Converse –Inverse and Contrapositive- Logical -Rules of Inference- Open Statements-Quantifiers.

Unit II:

Sets and Relations: Sets and Subsets-Operations on Sets and Laws of Set Theory-CartesianProduct of Sets-Relations-Operations on Relations-Properties of Relations-Equivalence Relations-Partial Orders-External elements in Posets.

Unit III:

Functions and Combinatory: Functions-Types of Functions-The Pigeonhole Principle-Recursive Functions-Definition-Fibonacci Series-Towers of Hanoi-The Rules of Sum and Product-Permutations-Combinations-Binomial and Multinomial Theorems-Combinations with Repetitions-The Principle of Inclusion-Exclusion.

Unit IV:

Graph Theory-I: Directed Graphs-Graphs-Isomorphism-Sub Graphs-Operations on Graphs-Walks and their classification-Connected and Disconnected Graphs-Euler circuits and Euler trials-Hamiltonian cycles and Hamiltonian paths.

Unit V:

Graph Theory-II: Planar and non-planar graphs-Graph Coloring-Map Coloring-Trees and theirbasic properties-Rooted Trees-Spanning Trees-Minimal Spanning Tree.

Outcomes:

1. Ability to apply the rules and laws of propositional logic on statements.
2. Understands the basic principles and operations on sets.
3. Attains capability to solve recursive functions and permutations and combinations.
4. Ability to understand graph theory and its applications.
5. Obtains knowledge in applications of trees.

Text Book:

1.Mathematical Foundations of Computer Science-3rd Edition-Dr. D.S.C.-Prism Books Pvt.Ltd.

References:

1.Discrete and Combinatorial Mathematics-An Applied Introduction-5th Edition –Ralph. P. Grimaldi. Pearson Education.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester I

MCA1.1.4: PROBABILITY STATISTICS AND QUEUING THEORY

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To discuss basics of probability and related theorems, problems.
2. To study about conditional probability and Baye's theorem.
3. To study about random variables and their properties. and to examine, analyze and compare Probability distributions.
4. To discuss regression and estimation techniques.
5.To discuss various types of tests such as F-test, Chi-square test. To study the various queuing models.

SYLLABUS

Unit I:

Probability: Definition of probability – Addition Theorem-Conditional probability – Multiplication theorem - Bayes' Theorem of Probability and Geometric Probability.
Random variables and their properties: Discrete Random Variable-Continuous Random Variable-Probability Distribution-Joint Probability Distributions & their Properties-TransformationVariables-Mathematical Expectations-Probability Generating Functions.

Unit II:

Probability Distributions: Discrete Distributions: Binomial-Poisson-Negative Binominal Distributions and their Properties.
ContinuousDistributions: Uniform-Normal-ExponentialDistributionsandTheir Properties.

Unit III:

Multivariate Analysis: Correlation-Correlation Coefficient-Rank Correlation –Regression Analysis- Multiple Regression.
Estimation: Sample –Populations – Statistic – Parameter-Sampling Distribution-Standard Error – Un-biasedness –Efficiency-Maximum likelihood Estimator-Notion &Interval Estimation.

Unit IV:

Testing of Hypothesis: Formulation of Null hypothesis-critical region-level of significance-power of the test.
Sample Tests: Small Sample Tests: Testing equality of means-testing equality of variances-test of correlation coefficient; Large Sample tests: Tests based on normal distribution (proportions, means, standard deviations).

Unit V:

QueuingTheory: Queue description–characteristics of a queuing model-study state solutions of M/M/1: Model, M/M/1; N Model.

Outcomes:

1. Solves various problems regarding probability and conditional probability.
2. Examine, analyze and compare probability distributions.
3. Prepares null and alternative hypothesis and test its validity based on random sample.
4. Solves various types of regression problems.
5. Understands various queuing models.

Textbook:

1 Probability, Statistics and Random Processes T.Veerarajan TataMcGraw–Hill
2 Fundamentals of mathematical statistics, S.C. Gupta and V.K.Kapoor ,schand publications.

References:		
1. Probability & Statistics with Reliability, Queuing and Computer Applications, KishorS. Trivedi, Prentice HallofIndia,1999 2. Fundamentals of mathematical statistics, S.C. Gupta and V.K.Kapoor ,s chand publications. 3. Probability&Statistics for Engineers and Scientists, Walpole, Myers, Myers, Ye. Pearson Education.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester I

MCA1.1.5: ACCOUNTING AND FINANCE MANAGEMENT

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:		
1.To introduce students to Accounting, stressing its importance in today's business world. 2.To help students understand the main concepts and principles of Accounting. 3.To provide students with a theoretical basis upon which they will develop their knowledge in other areas of accounting. 4. To apply finance concepts to real finance problems.		
	SYLLABUS	
Unit I:		
Accounting for Management: Nature and Scope of Accounting -Distinction between financial accounting & cost accounting-Generally accepted Accounting Principles (GAAP), Double Entry System of Accounting– Preparation of Journal, Ledger and Trial Balance.		
Unit II:		
Final Accounts: Preparation of Trading account, Profit and Loss Accounts and Balance Sheet with Normal Closing Entries (Simple numerical problems).		
Unit III:		
Ratio Analysis: Meaning, objectives, Advantages, Limitations - Types of Ratios and Their Usefulness. (Theory only). **Fund Flow Statement**: Meaning, Objectives, Advantages and Limitations, Preparation and Interpretation of Statement (Simple numerical Problems).		
Unit IV:		
Costing: Elements of cost- Cost Sheet Preparation (Simple numerical problems) - Marginal costing; Nature, scope, importance, Break even analysis-Contribution and Profit planning (with simple numerical problems).		
Unit V:		
Budget: Budgetary control – Types of budgets, Advantages, Limitations – Preparation of Flexible Budget, Cash budget (Simple Numerical Problems) – Zero Based Budgeting.		
Outcomes:		
1. Understands the role of accounting and its limitations. 2. Ability to prepare profit-loss account and balance sheet. 3. Ability to describe how investors and creditors use accounting. 4. Ability to solve numerical problems of costing. 5. Understands the preparation of budget and learn about budget control.		
Textbook:		
1. Financial Accounting - S.P. Jain&K.L.Narang, Kalyani Publications(I & II Units) 2. Management Accounting, R.K. Sharma and Shashi.K. Gupta (III, IV, V Units). 3. Accounting For Managers, S.N. Maheswari, SameerK.Maheswari.		
References:		
1. Introduction to Accounting, G. Agarwal.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester I

MCA1.1.6: PROGRAMMING METHODOLOGIES LAB

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:

1. To implement decision making and arrays.
2. To develop programs for pointers and structures.
3. To write programs using concepts of object orientation.
4. To implement inheritance and polymorphism.

SYLLABUS

Cycle – I

1.BASIC TECHNIQUES: Finding the sum of digits of a given number - Reverse of a given number.
2.DECISION MAKING: Finding the largest and the smallest of a given array–selecting an operation based on a menu.
3.LOOPING TECHNIQUES&ARRAYS: Finding the sum of n terms of a sine series– Matrix Multiplication–Polynomial addition
4.CHARACTERS AND STRING HANDLING: Finding the length of string– reversal of string–checking whether it is a palindrome or not.
5.POINTERS: Finding the sum of all elements of an array using pointers - Swapping the contents of two variables using pointers.
6.STRUCTURES: Finding the first and second rank holders and printing their names and roll numbers in a class of 60 students using structures.
7.FILES & OTHER TOPICS: Copying and concatenation of files–Command line parameters- C preprocessor directives.

Cycle – II

1. An Application in C++ using Classes and Objects. Program using Friend Functions.
2. Program using Inheritance.
3. Program using Operator Overloading.
4. Program using Runtime Polymorphism.
5. Program using files in C++.

Outcomes:

1. Student will be able to write basic C programs using iterative methods.
2. Exercise programs using pointers, structures and files.
3. Practice programs using objects and classes.
4. Ability to write C++ Applications.
5. Practice programs based on C++ features.

Text Book:

1. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearon Education, New Delhi.
2) Object Oriented Programming using C++, Balagurusamy, 5th Edition, McGraHill.

References:

1. YashwantKanetker, Let us C, BPB Publications.
2. Object Oriented Programming in C++, Robert Lafore, PHI Publication.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester I

MCA1.1.7: COMPUTER ORGANIZATION LAB

Credits: 2	Theory: 3 Hours	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:

1. To learn the about logic gates, half adders, full adders and flip -flops.
2. To learn about the microprocessor programming.
3. To learn about the microprocessor interfacing with stepper motor, R-2R ladder.
4. To develop the skill in writing microprocessor programming.

SYLLABUS

DIGITAL EXPERIMENTS

1. Verification of truth tables of Logic Gates
2. TTL characteristics, Verification of Demorgan's Laws
3. Implementation of Adders and Subtractors
4. Verification of Flip-Flops (RS- JK- D- T)
5. Design of 3-to-8 Decoder, Encoder
6. Multiplexer, De-Multiplexer

8085 ASSEMBLY LANGUAGE PROGRAMMING

7. Clears a Memory Location
8. To Move the Contents in one memory Location to Another
9. To Exchange the contents in Memory location
10. To Find the Sum of Two Numbers
11. To Transfer a Value from one Memory to Another (Indirect Mode)
12. To Exchange the contents in two Memory Locations (Indirect Mode)
13. To Add 2-8 Bits Store Result in 16-Bit (Indirect Mode)
14. To Find largest of 2-8 Bit NO's
15. To Find Smallest of 2-8 Bit NO's
16. To Add 2-16 bits Store Result in 32-Bit
17. To Find the Sum of Series of 8-bit and result in 16-Bit
18. To Determine a NO. Is Even or Odd
19. To Count NO. Of 1's in a given Byte
20. To find 2's Complement of a given NO.
21. To Multiply Two 8-Bit No.'s
22. To Perform Division of 2-8 Bit No's
23. To Find Factorial of a Given Number
24. To add 2-8Bit Numbers with Carry
25. To Shift Left One-Bit

Outcomes:

1. The student understands and learns the applications of Digital logic design.
2. The student understands and learns the concept ofmemory design.
3. The student understands and learns the concept of data interpretation.
4. The student understands and learns theconcept of data transmission.
5. The student develops the skill of writing microprocessor programming.

Text Book:

1. Computer System Architecture, M. Morris Mano, Third Edition, Pearson Education, 2007.
2. Computer Systems Organization & Architecture, John D. Carpinelli, Pearson Education, 2001.

References:		
1) Digital Logic and Computer Organization, V. Rajaraman and T.Radhakrishnan, PHI Publication, 2006. 2) Computer Organization – Car Hamacher, ZvonksVranesic, SafeaZaky, Vth Edition, McGrawHill. 3) Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi, Springer Int.Edition.		

Syllabi

With effect from 2016-17 admitted batch

I YEAR II SEMESTER

II Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA1.2.1	Object Oriented Programming Using Java	4	--	70	30	100	4
MCA1.2.2	Data Structures Using Java	4	--	70	30	100	4
MCA1.2.3	Operating Systems	4	--	70	30	100	4
MCA1.2.4	Elective – I: i) System Programming ii) File Structures iii) Information System & Organizational Behavior iv) Formal Languages and Automata Theory	4	--	70	30	100	4
MCA1.2.5	Ecology and Environment	4	--	70	30	100	4
MCA1.2.6	Data Structures Using Java Lab	--	3	50	50	100	2
MCA1.2.7	Operating Systems Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**24**

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester II

MCA1.2.1: OBJECT ORIENTED PROGRAMMING USING JAVA

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1.The main objective is to teach the basic concepts and techniques which form the object-oriented programming paradigm.
2.Students completing the course should know the model of object-oriented programming: abstract data types, encapsulation, inheritance and polymorphism.
3.Students completing the course should know fundamental features of an object-oriented language like Java: object classes and interfaces, exceptions and libraries of object collections.
4.Students completing the course should know how to take the statement of a business problem and from this determine suitable logic for solving the problem; then be able to proceed to code that logic as a program written in Java.

	SYLLABUS	
Unit I:		

Introduction: Object Oriented Paradigm - Basic Concepts of OOP - Benefits of OOP - Java history - Java Features - Java Environment - Simple Java Program - Java Program Structure - Java Tokens - Implementing a Java Program – JVM - Command Line Arguments – Variables – Constants - Data Types - Declaration of Variables - Scope of Variables - Type Casting – Operators - Control Statements – Arrays – Strings - Vectors.

Unit II:		

Classes-Objects-Methods: Defining a Class - Fields Declaration - Methods Declaration - Creating Objects - Accessing Class Members – Constructors - Methods Overloading - Static Members - Nesting of Methods.
Inheritance: Basics - Extending a Class - Extending a Class - Overriding Methods - Final Variables and Methods - Final Classes - Abstract Methods and Classes.

Unit III:		

Interfaces and Packages: Defining Interfaces - Extending Interfaces - Implementing Interfaces - Accessing Interface Variables - Creating Packages - Accessing a Package - Using a Package - Adding a Class to a Package - Java API Packages - Using System Packages - Naming Conventions.

Unit IV:		

Multithreaded Programming: Creating Threads - Extending the Thread Class - Life cycle of Thread - Using Thread Methods - Thread Exceptions - Thread Priority – Synchronization - Implementing the Runnable Interface - Inter-Thread Communication.
Managing Errors and Exceptions: Types of Errors – Exceptions - Syntax of Exception Handling Code - Multiple Catch Statements - Using Finally Statements - Throwing Our Own Exceptions - Using Exceptions for Debugging.

Unit V:		

Event Handling: Events - Event Sources - Event Classes - Event Listeners - Delegation Event Model - Handling Mouse and Keyboard Events - Adapter Classes - Inner Classes.
AWT: The AWT Class Hierarchy - User Interface Components- Labels – Button – Canvas – Scrollbars - Text Components - Check Box - Check Box Groups – Choices - Lists Panels – Scroll Pane – Dialogs - Menu Bar – Graphics - Layout Manager – Layout Manager Types.
Applets: Building Applet Code – Applet Life cycle – Creating an Executable Applet – Designing Web Page – Applet Tag – Adding Applet to HTML File – Running the Applet.

Outcomes:		
1. Understands the basics of java programming. 2. Understands the concepts of object orientation methods and inheritance using java. 3. Obtain the overview of interfaces and java API. 4. Gains knowledge on multithreading and exception handling in JAVA. 5. Able to design GUI using applets.		
Text Book:		
1. Programming with java, E. Balagurusamy, TATAMcgraw Hill.		
References:		
1. Head First Java 2nd edition, Kathy Sierra and Bert Bates. Orielly Publications 2. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester II

MCA1.2.2: DATA STRUCTURES USING JAVA

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To discuss about stacks and queues using arrays and linked lists.
2. To develop programs for searching and sorting algorithms.
3. To explain the concepts of various trees.
4. To implement programs using graphs.

SYLLABUS

Unit I:

Introduction to Data Structures: Abstract Data Types, Arrays, List ADT, Stack ADT and operations, implementation of Stacks using Arrays. Applications of Stacks: Infix to Postfix conversion and postfix evaluation, Recursion.

Unit II:

Queue ADT: Operation on queues, implementation of queues using arrays, circular queues andimplementation. Single Linked Lists: single linked lists and operations, implementation of single linked lists, implementation of stacks and queues using single linked lists.

Unit III:

Doubly linked lists: Operations, implementation of doubly linked lists, deques. **Trees**: Terminology, basic properties and representation, Binary trees, traversals of a binary tree - Binary search trees and operations, AVL trees, B-trees.

Unit IV:

Graphs: Definition and representation of graphs, Graph traversal techniques, Minimal spanning trees-Prims and Kruskals algorithms, Dijkstraw's shortest path Algorithm. Hashing: Common Hash functions, Collision Resolution techniques, Dictionary ADT.

Unit V:

Sorting: General Background, Insertion Sort, Selection Sort, Bubble Sort, Quick Sort, Merge Sort, Heapsort, Radix Sort, time complexities. Searching: Linear Search, Binary Search.

Outcomes:

1. Acquires knowledge on implementationof Stacks and their applications.
2. Develop knowledge on queues and linked lists.
3. Ability to implement various tree data structures and their properties.
4. Acquires knowledge on graphs and its applications.
5. Familiarizes with various sorting and searching techniques.

Text Book:

1.Data Structures and Algorithm Analysis in C++, MARK ALLEN WEISS, Pearson Edition.

References:

1. DATA STRUCTUERS AND ALGORITHMS IN JAVA, MITCHELL WAITE, SignatureSeries.
2. Data Structures and Algorithms in C++, 2nd edition, A. Drozdek, Thomson.
3. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert schildt. TMH.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester II

MCA 1.2.3: OPERATING SYSTEMS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1.To learn about fundamentals, functions and types of operating systems.
2.To learn the mechanisms of OS to handle processes and threads and their communication.
3.To gain knowledge on operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and memory management algorithms.
4. To provide the knowledge towards process synchronization and virtual memory, Secondary storage structure and Security.

SYLLABUS

Unit I:

Introduction: Introduction to Operating Systems- Computer-System Organization- Computer-System Architecture- Operating-System Structure- Operating-System Operations- Process Management- Memory Management- Storage Management- Protection and Security- Distributed Systems. **System Structure:** Operating-System Services- User Operating-System Interface- System Calls- Virtual Machines- System Boot.

Unit II:

Process Concept: Process Concept- Process Scheduling. Operations on Processes-Interprocess Communication. **Process Scheduling:** Basic Concepts- Scheduling Criteria- Scheduling-Algorithms- Algorithm Evaluation. **Synchronization:** Background- The Critical-Section Problem- Peterson's Solution- Synchronization Hardware- Semaphores- Classic Problems of Synchronization- Monitors.

Unit III:

Deadlocks: System Model- Deadlock Characterization- Methods for Handling Deadlocks-Deadlock Prevention- Deadlock Avoidance- Deadlock Detection- Recovery from Deadlock.
Memory Management Strategies: Background- Swapping- Contiguous Memory Allocation-Paging- Structure of the Page Table- Segmentation.

Unit IV:

Virtual Memory Management: Background- Demand Paging- Copy-on-Write- Page Replacement- Allocation of Frames- Thrashing. **File System Interface:** File Concept- Access Methods- Directory and Disk Structure. **Implementing File Systems:** File-System Structure-File-System Implementation- Allocation Methods- Free-Space Management.

Unit V:

Secondary Storage Structure: Overview- Disk Structure- Disk Scheduling- Disk Management- Swap-Space Management- RAID structure. **System Protection:** Goals of Protection- Principles of Protection- Domain of Protection- Access Matrix. **System Security:** The Security Problem- Program Threats- System and Network Threats- Cryptography as a Security tool- User Authentication.

Outcomes:

1. Familiarizes with the fundamentals and different types of operating systems.
2. Ability to learn Process Scheduling and synchronization.
3. Acquaint knowledge about Deadlocks.
4. Learns about memory management and CPU scheduling techniques.
5.Studies about Disk Scheduling, Disk Management and Security issues.

Text Book:

1.Operating System Concepts- 8th edition- Abraham Silberschatz- Peter Galvin- Grey Gagne-JohnWiley& Sons.

References:		
1.Dhamdhere (IInd Revised Edition)- System Programming and Operating Systems & System Programming- Tata McGraw Hill. 2. Unix Shell Programming BPB Yashawant kanetkar. 3.Modern Operating Systems- A.S Tanenbaum Pearson/PHI latest Edition. 4. Operating Systems -William Stallings- PHI latest Edition.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester II
(Elective-I)

MCA1.2.4: SYSTEMS PROGRAMMING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:		
1. To understand the evolution of hypothetical machine and Introduction to formal Languages and processing of high-level languages. 2. To understand the structure and design of a two-pass assembler. 3. To understand the structure and design of one pass assemblers, macro languages and macro processors. 4. To get the knowledge of Loaders and linkers.		
	SYLLABUS	
Unit I:		
Introduction to Systems Programming: Machine Structure - Machine and Assembly Language Programming with IBM 360/370 -Grammars -Types of Grammars –Languages-FSM.		
Unit II:		
Assemblers: Concepts of Single Pass- Two- Pass and Multi- Pass Assemblers- Design of a Single and Two-Pass Assembler.		
Unit III:		
Macros and Macro Processors: Definition - Types of Macros - Macro Instructions - Features of Macro Facility like conditional Macro Expansion - Macros Calls within Macros - Macro Definitions within Macros - Design of Macro Processors: Single-Pass and Two-Pass.		
Unit IV:		
Loaders: Absolute Loader - Relocation Loader - Binders - Dynamic Loading and Linking – Design of Absolute Loader and Direct Linking Loaders.		
Unit V:		
General Model of Compiler: Phase of a Compiler - Detailed Discussion of different Phases. **Introduction to Software Tools:** Text editors- Interpreters- Program Generators- Debug Monitors.		
Outcomes:		
1. Learns the machine structure and assembly language perceptions. 2. Ability to design a single pass and 2-pass assembler. 3. Ability to design a single pass and 2-pass macroprocessor. 4. Familiarizes with loaders and design of dynamic linking loader. 5. Learns about the phases in compiler design.		
Text Book:		
1. John J. Donovan- Systems Programming- Tata McGraw Hill.		
References:		
1. Dhamdhere (IInd Revised Edition)- System Programming and Operating Systems & System Programming- Tata McGraw Hill. 2. Leland. L. Beck- System Software- Pearson Education.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)

M.C.A-Semester II

(Elective-I)

MCA1.2.4: FILE STRUCTURES

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To discuss about file processing operations.
2. To discuss about secondary storage devices.
3. To explain the concepts of file structure concepts.
4. To discuss about file indexing and B+ trees.

SYLLABUS

Unit I:

File Processing Operations: Physical and logical files, opening, reading & writing and closing files in C, seeking and special characters in files, physical devices and logical files, file-related header files in C.

Unit II:

Secondary Storage: Disks – organization, tracks, sectors, blocks, capacity, non-data overhead, cost of a disk access, Magnetic Tape – types, performance, organization estimation of tape length and data transmission times. **Journey and buffer Management: File** manager, I/O buffer, I/O processing, buffer strategies and bottlenecks.

Unit III:

File Structure Concepts: A stream file, field structures, reading a stream of fields, record structures and that uses a length indicator, mixing numbers and characters – use of a hex dump, reading the variable length records from the files. **Managing records in C files:** Retrieving records by keys, sequential search, direct access, choosing a record structure and record length, header records, file access and file organization. Organizing files for performance: Data compression, reclaiming space – record deletion and storage compaction, deleting fixed-length records for reclaiming space dynamically, deleting variable-length records, space fragmentation, replacement strategies.

Unit IV:

Indexing: Index, A simple index with an entry sequenced file, basic operations on an indexed, entry sequenced file, indexes that are too large to hold in memory, indexing to provide access by multiple keys, retrieval using combination of secondary keys, improving the secondary index structure – inverted lists.

Unit V:

Indexed sequential file access and prefix B+ Trees: Indexed sequential access, maintaining a sequence set, adding a simple index to the sequence set, the content of the index: separators instead of keys, the simple prefix B+ tree, simple prefix B+ tree maintenance, index set block size, internal set block size, internal structure of index set blocks: a variable order B-tree, loading a simple prefix B+ tree **Hashing:** Collisions in hashing, a simple hashing algorithms, hashing functions and record distributions, memory requirements, collision resolution by progressive overflow, buckets, deletions.

Outcomes:

1. Ability to learn file processing operations.
2. Familiarizes with secondary storage devices and buffer management.
3. Ability to understand the concepts of file structures.
4. Analyze the concepts of File indexing.
5. Learning B+ tree indexing and hashing concepts.

Text Book:

File Structures – An Object-Oriented Approach with C++ by Michael J. Folk, Bill Zoelli and Greg Riccardi, Pearson.

References:		
1. File Structures: An Object-Oriented Approach with C++, 3rd Edition. Michael J. Folk, University of Illinois Bill Zoellick, CAP Ventures.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)

M.C.A-Semester II

(Elective-I)

MCA1.2.4: INFORMATION SYSTEMS & ORGANIZATIONAL BEHAVIOUR

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Understanding the meaning of Organizational behavior
2. Understanding the basic approaches of Organizational behavior.
3. Knowing the importance of Organizational behavior for the managers.
4. Understanding the contemporary MIS theory and how information systems support business strategy, business processes, and practical applications in an organization.
5. Understanding the proven value of, and relationship between business data, data management, and business intelligence.

	SYLLABUS	
Unit I:		

Organization Structure: Features of Good Organization Structures, Designing of Organization Structure, Types of Organization Structures- Functional, Product, Geographic and Matrix Organization Structures.

Unit II:		

Motivation: Nature and importance of motivation, Theories of motivation – Maslow's, Herzberg's and McGregor's X and Y Theories of Motivation. **Leadership:** Meaning and definition, Importance of Leadership, Leadership styles, Communication: Process of Communication, Importance, Forms of Communication and Barriers in Communication.

Unit III:		

Group Dynamics: Types of Groups, Stages of Group Development, Group Behavior and Group Performance Factors. **Organizational Conflicts:** Reasons for Conflicts, Consequences of Conflicts in Organizations, Types of Conflict, Strategies for Managing Conflicts, Organizational Climate and Culture.

Unit IV:		

Management Information System: Nature and Scope, Characteristics and Functions. Classification of MIS - Transaction Processing System, Management Information System, Decision Support System, Executive Support System, Office Automation System and Business Expert System.

Unit V:		

Functional Information Systems: Production, Marketing, Finance and Human Resources Information Systems; Objectives and Functions of Information Resource Management.

Outcomes:		

1. Familiarizes with organizational behavior and structure.
2. Analyzes individual motivation and leadership skills.
3. Understands the group behavior and conflicts.
4. Understands the concepts of Information Systems in management.
5. Learns the activities of Functional Information System in an organization.

Text Book:		

1. Elements of Organizational Behavior, Robbins, 7th Edition, Pearson Education
2. Management Information Systems – D.P. Goyal, Macmillan Publishers India Ltd.

References:		

1. Organizational Behavior – L.M. Prasad, Sultan Chand and sons
2. Management Information Systems - L.M. Prasad, Usha Prasad, Sultan Chand and sons
3. Management Information Systems – Kantar Erma, PHI.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)

M.C.A-Semester II

(Elective-I)

MCA1.2.4: FORMAL LANGUAGES AND AUTOMATA THEORY

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Understand basic properties of Deterministic and Nondeterministic Finite Automata.
2. Understand basic properties of Languages, Grammars, Normal forms and difference between types of languages and types of automata.
3. Understand Pushdown Automata and Turing Machines, concepts of tractability and decidability, concepts of NP-Completeness and NP-Hard problems.
4. Understand the challenges of Theoretical computer science and its contribution to other sciences.

	SYLLABUS	
Unit I:		

Theory of Automata: Definition and Description of an Automaton-Transition Systems-Properties and Acceptance of a String by Automaton-Deterministic Finite Automata (DFA) and Nondeterministic Finite State Automata (NDFA)-Equivalence of DFA and NDFA-Mealy and Moore Models-Minimization of Finite Automata.

Unit II:		

Formal Languages: Basic Definitions and Examples-Grammar and Types of Grammar-Language and Chomsky classification of Languages- Language generated by Grammar-Grammar generated by Language-Operations on Languages-Languages and Automata.

Regular Sets and Regular Grammar: Regular Expressions-Finite Automata and Regular Expressions-Pumping Lemma for Regular Sets-Application of Pumping Lemma-Closure properties of Regular Grammar.

Unit III:		

Context-Free Languages: Context-Free Languages (CFL) and Derivation Trees-Ambiguity in Context-Free Grammars (CFG)-Simplification of CFG-Normal Forms for CFG-Pumping Lemma for CFL-Closure Properties of CFL-Decision Algorithms for CFL.

Pushdown Automata: Definition-Acceptance of PDA- Pushdown Automata and Context-free Languages-Parsing and PDA.

Unit IV:		

Turing Machines: Definition and Model-Representing of Turing Machines-Language Acceptability by Turing Machine-Design and Description of Turing Machine-Techniques and Variants of Turing Machine.

Decidability and Recursively Enumerable Languages: Decidability-Decidable and Undecidable Languages-Halting Problem of TM-Post Correspondence Problem-Godelization.

Unit V:		

Computability and Complexity: Basic Concepts-Primitive Recursive Functions-Recursive Functions-Partial Recursive Functions- The Classes P and NP-Polynomial Time Reduction-Importance and Use of NP Completeness.

Outcomes:		

1. Familiarizes with various types of Finite Automata.
2. Understand the types of Grammar and Regular expressions.
3. Learn the concepts of Context Free Language, Normal Forms and Pushdown Automata.
4. Ability to construct Turing machines and apply on its applications.
5. Optimize computability using Recursivefunctions and Time Complexity using P & NP Completeness.

Text Book:		
1.Theory of Computer Science, K.L.P. Mishra & N.Chandrasekaran, Third Edition, Prentice Hall of India Private Limited.		
References:		
1. Elements of Theory of Computation, Harry R Lewis &CristosH.Papadimitriou, Pearson Education/Prentice Hall of India Privated Limited. 2. Introduction to Automata theory, Languages& Computation, Hopcroft.J.E and J.D.Ullman, Addision-Wesely, Mass 1979.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester II

MCA1.2.5: ECOLOGY AND ENVIRONMENT

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. The Program seeks to provide students better understanding and planning for conservation through an interdisciplinary environmental sciencecurriculum.
2. Designed to enhance scientific inquiry and to strengthen scientific competence.

To aim at preparing and providing students to opportunities for careers in environmental sciences, environmental health, public health, and medical schools.

	SYLLABUS	
Unit I:		

Fundamentals of Environment & Ecology: Environment definition - Environmental Segments - Concepts of Ecosystem - Fundamentals of Ecology and Ecosystem - Components of ecosystem - Food chain - Food web -Trophic level - Energy flow - Ecological pyramids - structure and function of ecosystem: Forest – Grassland - Desert and Aquatic ecosystem.

Unit II:		

Bio-diversity and its conservation: Value of bio-diversity-consumptive and productive use - social, ethical, aesthetic and optional values - Bio-geographical classification of India- India as a mega diversity habitat - Threats to biodiversity- Hot spots - habitat loss - poaching of wildlife - loss of species – seeds - Conservation of bio-diversity- In-situ and Ex-situ conservation.

Unit III:		

Natural Resources and Management: Forest resources: Use and over-exploitation– deforestation- Timber extraction – mining - dams and their effects on forest and tribal people. **Water resources:** Use and over-utilization of surface and ground water - floods and droughts - Water scarcity and Ground Water depletion - Water conservation methods- rain water harvesting - watershed management. **Food resources:** World food problems - changes caused by agriculture and overgrazing - effects of modern agriculture – fertilizer-pesticide problems. **Energy resources**: Growing energy needs - renewable and non-renewable energy sources - use of alternate energy sources - Hydrogen as an alternative future source of Energy. **Land resources:** Land as a resource - land degradation - soil erosion and desertification -Wasteland reclamation.

Unit IV:		

Environmental Pollution & Current Environmental Issues of Importance : Air Pollution, - Climate Change and Global warming: Effects, Acid Rain, Ozone Layer depletion - Photochemical Smog - Solid waste management - Water pollution,Marinepollution,Waste water treatment - Land pollution, Noise pollution - Effects of human activities on the quality of environment: Urbanization-Transportation- Industrialization; Solid waste management, composting, vermiculture- Urban and industrial wastes, recycling and reuse,Equitable use of resources for sustainable lifestyles.

Unit V:		

Environmental Legislation: Environmental Acts: Water (Prevention and Control of pollution) act-Air (Prevention and Control of pollution) act-Envt. Protection act-Wild life Protection act-Forest Conservation Act-Coastal Zone Regulations. **Social Issues and the Environment: Basics** of Environmental Impact Assessment - Population growth and environment - Economy and Environment - Environmental education - Environmental movements in India - Sustainable Development.

Outcomes:		
1. Recognize major concepts in environmental sciences and demonstrate in-depth understanding of the environment. 2. Develop analytical skills, critical thinking, and demonstrate problem-solving skills using scientific techniques. 3. Demonstrate the knowledge and training for entering graduate or professional schools, or the job market.		
Text Book:		
1.BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India, 2. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 3.Environmental Chemistry by B.K. Sharma & H. Kaur, Goel Publishing House. 4. Environmental Studies by P.D. Sharma. 5.Environmental Studies by Kaushik & Kaushik.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester II

MCA1.2.6: DATA STRUCTURES USING JAVA LAB

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:		
1. To implement stacks and queues using arrays and linked lists. 2. To develop programs for searching and sorting algorithms. 3. To write programs using concepts of various trees. 4. To implement programs using graphs.		
	SYLLABUS	
Cycle I:		
1. List ADT implementation using arrays. 2. Implementation of Stacks using Arrays. 3. Evaluation of postfix Expression.		
Cycle II:		
1.Queues using arrays. 2.Circular queue using arrays. 3. Implementation of single Linked Lists. 4. Stacks and Queues using Single Linked Lists. 5. Implementation of a Dequeue.		
Cycle III:		
1.Binary Tree Traversals using Recursion. 2.Binary Search Tree-insertion, deletion, and traversing. 3.BFS and DFS Graph traversals. 4. Dictionary ADT implementation**.**		
Cycle IV:		
1. Insertion sort, Selection sort, and Bubble sort. 2. Quick sort and Merge sort. 3. Linear search and Binary search		
Outcomes:		
1. Practice applications of stacks and queues. 2. Able to write programs to implement linked list. 3. Practice implementation of various searching and sorting techniques. 4. Implementation of TREES and GRAPHS. 5. Exhibit applications using data structures.		
Text Book:		
1. Data Structures and Algorithm Analysis in C++, MARK ALLEN WEISS, Pearson Edition.		
References:		
1. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester II

MCA 1.2.7: OPERATING SYSTEMS LAB

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:		
1. To familiarize the students with the Architecture of UNIX Operating System. 2. To learn the mechanisms of CPU Scheduling and Deadlock Detection algorithms. 3.To learn mechanisms of Processes synchronization using semaphores. 4. To familiarize students on UNIX System Calls and shell programming		
	SYLLABUS	
Cycle 1		
1. Write programs using the system calls of UNIX operating system. 2. UNIX Shell Programming.		
Cycle 2		
1. Programs to simulate process scheduling like FCFS- SJF and Round Robin. 2. Programs to simulate page replacement algorithms like FIFO- Optimal and LRU. 3. Programs to simulate deadlock detection. 4. Implement the Producer – Consumer problem using semaphores.		
Cycle 3		
1.Implement the Producer-Consumer Program using Semaphores. 2.Implement Paging memory management scheme. 3.Implement any file allocation technique (Linked-Indexed-Contiguous).		
Outcomes:		
1. Differentiate the command set of MS Dos and UNIX. 2. Familiarizes with shell programming and shell commands. 3. Practice programs using system calls. 4. Implementation of CPU Scheduling and Deadlock Algorithms. 5. Implementation of Page replacement algorithms.		
Text Book:		
1) Unix Systems Programming: Communication- Concurrency and Threads- Kay Robbins- 2-Edition- Pearson Education 2) Unix concepts and applications-Sumitabha Das- TMH Publications. 3) Unix programming- Stevens- Pearson Education. 4) Shell programming-YashwanthKanetkar. 5) Operating System Concepts-Silberschatz- and Peter Galvin. 6) Beginning Android 4 Application Development by Wei-Meng Lee-Wiley India Pvt Ltd.		

Syllabi

With effect from 2016-17 admitted batch

II YEAR I SEMESTER

III Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA2.1.1	Computer Graphics	4	--	70	30	100	4
MCA2.1.2	Database Management Systems	4	--	70	30	100	4
MCA2.1.3	Artificial Intelligence	4	--	70	30	100	4
MCA2.1.4	Operation Research	4	--	70	30	100	4
MCA2.1.5	Elective – II: i) Design & Analysis of Algorithms ii) Software Engineering iii) Embedded Systems iv) Compiler Design	4	--	70	30	100	4
MCA2.1.6	Graphics and Multimedia Lab	--	3	50	50	100	2
MCA2.1.7	Database Management Systems Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**24**

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III

MCA2.1.1: COMPUTER GRAPHICS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Provides a comprehensive introduction to computer graphics with a foundation in Graphics Applications.
2. A thorough introduction to computer graphics techniques.
3. To give the basics of Geometric Transformations and projections.
4. To introduce three dimensional concepts and object representations with color models and basics of computer animation.

SYLLABUS

Unit I:

Introduction: Video Display Devices- Graphics Software- Line Drawing Algorithms-Loading the Frame Buffer-Circle Generating Algorithms- Ellipse Generating Algorithms-Attributes of aLine- Attributes of a Curve.

Unit II:

Two Dimensional Geometric Transformations and Viewing: Basic Transformations-Matrix Representations and Homogeneous Coordinates-Composite Transformations-Other Transformations-Viewing Pipeline-Viewing Coordinate Reference Frame-Window-to-Viewport Coordinate Transformation-2D viewing Functions-Line Clipping: Cohen Sutherland Algorithm-Liang Barsky Algorithm-Polygon Clipping: Sutherland Hodgeman Algorithm-Curve Clipping and Text Clipping.

Unit III:

Three Dimensional Geometric Transformations and Viewing: Translation- Rotation-Scaling- Viewing Pipeline- Projections: Parallel Projections-Perspective Projections. Three-Dimensional Object Representations: Bezier curves and surfaces-bezier curves-Properties-designing techniques-Bezier surfaces.

Unit-IV:

Color Models and Computer Animation: Basic Properties and functions of light- Color Models: RGB-CMY- Design of Animation Sequences-Computer Animation Languages-Motion Specifications.

Unit V:

Compression Techniques and Basics of Surface Rendering Techniques: Multimedia Data Compression Techniques: Lossless Compression Algorithms: Run-Length Coding-Variable Length Coding-Lossless and Lossy Image Compression Algorithms--Multimedia Applications-Media Preparation-media composition-integration and entertainment.

Outcomes:

1. Understands graphics devices, software and their applications.
2. Learns graphic transformation techniques.
3. Familiarizes with graphics modeling using Bezier curves and surfaces.
4. Gains knowledge of animation languages and motion specifications.
5. Ability to understand compression techniques.

Text Book:

"Computer Graphics C version"- Donald Hearn and M. Pauline Baker- Pearson education.
Multimedia Computing Communication &Applications "By Ralf Steimnety&KerlaNeshtudt." Prince

References:		
1. “Computer Graphics Second edition”- Zhigandxiang- Roy Plastock-Schaum’s outlines- Tata McGraw hill edition. 2. “Procedural elements for Computer Graphics”- David F Rogers- Tata McGraw hill- 2ndedition. 3. “Principles of Interactive Computer Graphics”- Neuman and Sproul- TMH. 4. “Principles of Computer Graphics”- Shalini- Govil-Pai- Springer. 5. “Computer Graphics”- Steven Harrington- TMH.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III

MCA 2.1.2: DATABASE MANAGEMENT SYSTEMS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To understand the different issues involved in the design and implementation of a database system.
2. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models.
3. To understand and use data manipulation language to query, update, and manage a database.
4. To develop an understanding of essential DBMS concepts such as: database security, integrity, and concurrency.
5. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

	SYLLABUS	
Unit I:		

Overview of Database systems: History- File system verses DBMS-Advantages of DBMS-describing and storing of data-Transaction management-structure of DBMS-People who work with DBMS. **Introduction to Database Design**: Design-ER diagrams-Beyond ER Design-Entities- Attributes and Entity Sets-Relationships and Relationship sets- Additional features of ER Model-Conceptual Design with the ER Model-Conceptual Design for Large enterprises. **Relational Model**: Introduction to the Relational Model – Integrity Constraints Over Relations-Enforcing Integrity Constraints-Querying relational data- Logical data base Design-Introduction to Views – Destroying /altering Tables and Views.

Unit II:		

Relational Algebra and Calculus: Relational Algebra – Selection and Projection-Set operations- Renaming-Joins-Division-Examples of Algebra Queries-Relational calculus – Tuple relational Calculus – Domain relational calculus. **Form of Basic SQL Q**uery – Examples of Basic SQL Queries- Introduction to Nested Queries- Correlated Nested Queries- Set – Comparison Operators- Aggregate Operators-NULL values – Comparison using Null values – Logical connectives – Impact on SQL Constructs- Outer Joins-Disallowing NULL values- Complex Integrity Constraints in SQL Triggers and Active Data bases.

Unit III:		

Introduction to Schema Refinement – Problems Caused by redundancy- Decompositions – Problem related to decomposition-Functional Dependencies - Reasoning about FDS-Normal Forms – BCNF –Properties of Decompositions- Loss less- join Decomposition-Dependency preserving Decomposition-Schema Refinement in Data base Design – Multi valued Dependencies – FOURTH Normal Form-Join Dependencies-FIFTH Normal form-Inclusion Dependencies.

Unit IV:		

Overview of Transaction Management: The ACID Properties-Transactions and Schedules- Concurrent Execution of Transactions – Lock Based Concurrency Control-Deadlocks – Performance of Locking – Transaction Support in SQL.
Concurrency Control: Serializability and recoverability – Introduction to Lock Management – Lock Conversions-Dealing with Dead Locks-Specialized Locking Techniques – Concurrency Control without Locking. **Crash recovery:** Introduction to Crash recovery- Introduction to ARIES-the Log -Other Recovery related Structures- the

Write-Ahead Log Protocol-Check pointing-recovering from a System Crash-Media recovery.

Unit V:

Overview of Storage and Indexing: Data on External Storage-File Organization and Indexing – Clustered Indexes- Primary and Secondary Indexes-Index data Structures – Hash Based Indexing-Tree based Indexing-Comparison of File Organizations.

Outcomes:

1. Understandsvarious database models.
2. Obtain querying techniquesin Entity Relation model.
3. Learn optimization of database design with Normalization.
4. Familiarizewith the concepts of Serializability, Concurrency control and crash recovery.
5. Gain an overview of storage and indexing structures.

Text Book:

Database Management Systems- Raghu Ramakrishnan- Johannes Gehrke- TMH- 3rd Edition-2003.

References:

1. Introduction to Database Systems-C.J. Date-Pearson Education.
2. Data base System Concepts- A. Silberschatz-H.F. Korth- S. Sudarshan-McGraw hill- VI edition-2006.
3. Fundamentals of Database Systems 5th edition. -Ramez Elmasri- Shamkant B.Navathe- Pearson Education-2008.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III

MCA2.1.3: ARTIFICIAL INTELLIGENCE

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1.The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence that includes problem solving, Searching Techniques, knowledge representation, logics, reasoning, planning, perception & action, and learning.

2. To learn about AI problem, Production Systems and their characteristics.

3. To understand the importance of search and the corresponding search strategies for solving AI problem.

4. Become familiar with basic principles of AI toward knowledge representation, logic and Reasoning.

5. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks.

	SYLLABUS	
Unit I:		

Introduction: What is Artificial Intelligence, The AI Problem, The Underlying Assumptions, what is an AI technique, The Level of the Model, Criteria for Success? Problem, Problem Spaces and Search:
Defining Problem at a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics and Issues in design of search programs. Heuristic Search Techniques: Generate-and-Test, Hill Climbing, Best-First-Search, Problem Reduction, Constraint Satisfaction, Means-End-Analysis.

Unit II:		

Knowledge Representation Issues: Representations and Mappings, Approaches to Knowledge Representation, Issues in Knowledge Representation, The Frame Problem. Representing knowledge using Rules: Procedural versus Declarative knowledge, Logic Programming, Forward versus Backward reasoning, matching, control knowledge. Work Slot and Filler Structures: Semantic nets, Frames. Strong slot and Filler Structures: Conceptual Dependency, Scripts.

Unit III:		

Using Predicate Logic: Representing Simple Facts in Logic, Representing Instance and Isa Relationships, Computable Functions and Predicates, Resolution, Natural Deduction. Symbolic Reasoning under uncertainty: Introduction to Non-monotonic Reasoning, Logics of Non-monotonic Reasoning, Statistical Reasoning: Probability and Bay's theorem, Certainty factors and rule-based systems, Bayesian Networks, Dumpster-Shafer Theory, Introduction to Fuzzy Logic.

Unit IV:		

Expert Systems: Introduction, Rule Based Expert System Architecture, Non-Production System Architecture, Dealing with Uncertainty, Knowledge Acquisition and Validation, Knowledge System Building Rules.

Unit V:		

Neural Networks: Characteristics of Neural Networks, Historical Development of Neural Networks Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws, Pattern Recognition Problem.

Outcomes:		
1. Understands thehistory of Artificial Intelligenceand its foundations. 2. Familiarizewith knowledge representation issues and concepts. 3. Obtains the knowledge to represent the language sentences using predicate logic. 4. Gains awareness about expert system. 5. Develops awareness onneural networks models.		
Text Book:		
1) Artificial Intelligence, 2nd Edition, E. Ritch and K.Knight (TMH). 2) Introduction to Artificial Intelligence and Expert Systems – Dan W. Patterson – Pearson Education –Low Price Edition.		
References:		
1) Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/Pearson Education. 2) Artificial Neural Networks B. YagnaNarayana, PH		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III

MCA2.1.4: OPERATIONS RESEARCH

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To discuss about basic Operation Research concepts, Formulation of LPP and its solution using graphical method and Solving LPP using various methods.
2. To study the various solutions of transportation problems, assignment problems and Sequencing problems.
3. To discuss about PERT and CPM charts in Network models, Replacement problems and inventory problems.
4. To discuss about non-linear programming problems, and integer programming problems.
5. To discuss about simulation models and game theory.

	SYLLABUS	
Unit I:		

Overview of Operations Research Types of OR Models - Phases of Operations Research– OR Techniques, Introduction to Linear Programming problem: Formulation of Linear Programming Problem, Graphical Solution; Graphical Sensitivity Analysis, Standard Form of LPP, Basic Feasible Solutions - Unrestricted Variables, Simplex Algorithm- Artificial Variables --Big M Method- Two Phase Simplex Method-Degeneracy- Alternative Optimal, Unbounded Solutions-Infeasible Solutions, Primal And Dual Problems And Their Relations, Dual Simplex Method.

Unit II:		

Transportation Problems : Initial Solutions- North West Corner Rule- Lowest Cost Method, Vogel's Approximation Method- Optimum Solutions of TPP- Degeneracy in Transportation-Transportation Algorithms , Assignment Problem , Assignment Problem as LPP, Hungarian Method- Travelling Salesman Problem-Solutions Of TSP, Sequencing Problems, N-Jobs Two Machine Problems- N-Jobs K Machines Problems- Two-Jobs M-Machine Problems- Crew Scheduling Problems.

Unit III:		

Network models : Network Representation of A Project- CPM and PERT - Critical Path Calculations- Time – Cost Optimizations- PERT Analysis and Probability Considerations- Resource Analysis in Network Scheduling. Replacement Problems-Individual And Group Replacement Policy- Reliability & System Failure Problems Inventory theory-Factors Effecting Inventory-EOQ Inventory Problems With and Without Shortages- Inventory Problems With Price Breakups- Multi Item Deterministic Problems. Probabilistic Inventory Problems.

Unit IV:		

Non-Linear Programming: Dynamic Programming- Recursive Nature of Dynamic Programming - Forward and Backward Recursion- Solutions of LPP As Dynamic Programming Technique Integer Programming: Branch and Bound Algorithms-Cutting Plane Algorithm.

Unit V:		

Simulation: Introduction to Simulation, Simulation Models- Event Type Simulations, Generation of Random Numbers-Monte-Carle Simulation-Simulation of Networks; Game theory: Two Person Zero Sum Games - Mixed Strategy Games and Their Algorithms.

Outcomes:		
1. Develops ability to solve LPP problems using various methods. 2. Ability to solve transportation, assignment and sequencing problems using several methods. 3. Familiarize with PERT & CPM charts andsolves replacement & inventory theory problems. 4. Learns to analyze non-linear programming and integer programming problems. 5. Gains knowledge to solve simulation and game theory problems.		
Text Book:		
1. Operations Research, Kanti Swaroop, P.K. Gupta, Man Mohan, Sulthan Chand& Sons Education 2. Operations Research By S.D Sharma		
References:		
1. Publishers Operations Research – An Introduction, Handy A Taha – Pearson Education 2. Operations Research R. Panneerselvan Prentice Hall of India. 3. Introduction to Operations Research, F.S. Hiller, G.J. Liberman, TMH 4. Operations Research, Richard Bronson, Schaum's Series, Mcgrawhill.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III
(Elective-II)

MCA2.1.5: DESIGN AND ANALYSIS OF ALGORITHMS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To learn mathematical background for analysis of algorithm.
2. To learn various advanced data structures.
3. To understand the concept of designing an algorithm.
4. To understand the solution of problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking, branch and bound and NP Hard and completeness problems and writing programs for these solutions.

	SYLLABUS	
Unit I:		

Introduction: Fundamentals of algorithmic problem solving – important problem types – fundamental data structures. Fundamentals of analysis of algorithms and efficiency – Analysis framework – AsymptoticNotations and Basic Efficiency classes – Mathematical Analysis of Non-recursive Algorithms –Mathematical Analysis of recursive Algorithms – Empirical Analysis of Algorithms – Algorithm Visualization. Brute Force – Selection Sort and Bubble sort – Sequential Search and Brute – Force StringMatching – Closest Pair and Convex-Hull Problems by Brute Force – Exhaustive Search

Unit II:

Divide-and-Conquer: Mergesort – Quicksort – Binary Search – Binary Tree Traversals and Related Properties – Multiplication of large integers and Strassen's Matrix Multiplication – Closest- Pair Convex-Hull Problems by Divide- and – Conquer, Decrease – and – Conquer: Insertion Sort – Depth-First Search and Breadth-First Search-Topological Sorting – Algorithms for Generating Combinatorial Objects – Decrease-by-a-Constant-Factor Algorithms – Variable-Size-Decrease Algorithms

Unit III:

Transform-and-Conquer: Presorting – Gaussian Elimination – Balanced Search Trees – Heap and Heapsort – Horner's Rule and Binary Exponentiation – Problem Reduction, Space and Time Tradeoffs: Sorting by Counting – Input Enhancement in string Matching –Hashing – B-Trees

Unit IV:

Dynamic Programming: Computing a Binomial Coefficient – Warshall's and Floyd's Algorithm– Optimal Binary Search Trees – The Knapsack Problem and Memory Functions.

Greedy Technique: Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman Trees.

Unit V:

Limitations of Algorithm Power: Lower-Bound Arguments – Decision Trees – P, NP and NP – complete problems – Challenges of Numerical Algorithms

Coping with the Limitations of Algorithms: Power – Backtracking – Branch-and-Bound – Approximation Algorithms for NP-hard Problems – Algorithms for solving Nonlinear Equations.

Outcomes:		
1. Understands the algorithmic efficiency, asymptotic notations and brute force techniques. 2.Familiarizewith divide and conquer strategy for several applications. 3. Learns the techniques of transform and conquer. 4.Develops knowledge on dynamicprogramming and greedy technique for real time applications. 5. Analyze the limitations of algorithms.		
Text Book:		
Introduction to Design & Analysis of Algorithms by AnanyLevitin, Pearson Education, NewDelhi, 2003		
References:		
1. Fundamentals of Computer Algorithms, Horowitz and Sahni, Galgothia publications. 2. Introduction to Algorithms by Thomas H. Corman, Charles E. Leiserson, Ronald R. Rivest&Clifford Stein, Prentice Hall of India, New Delhi, New Delhi. 3. The Design and Analysis of computer Algorithms, Aho, Hopcroft& Ullman, Pearson Education, New Delhi, 2003 4. Fundamentals of algorithmics, Gilles Brassard & Paul Bratley, Prentice Hall of India, New Delhi.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III
(Elective-II)

MCA2.1.5: SOFTWARE ENGINEERING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Understanding Software Engineering and software process models such as waterfall and evolutionary models.
2. Understanding of software requirements and different requirement models.
3. Understanding of design engineering and different design models.
4. Understanding of software testing and software product metrics to maintain software quality.

	SYLLABUS	
Unit I:		

Software and Software Engineering: Defining Software - Software Application Domains - Unique Nature of WebApps - Software Engineering - Software Process.
Process Models: Generic Process Model - Process Assessment and Improvement - Prescriptive and Specialized Process Models - Unified Process - PSP and TSP - Process Technology - Product and Process.
Agile Development: Agile Definition - Agile Process - Agile Extreme Programming - Other Agile Process Models.

Unit II:		

Principles that Guide Practice: Software Engineering Knowledge - Core principals. **Understanding Requirements:** Requirements Engineering - Groundwork - Elicitation Requirements - Developing Use cases - Building Requirements Model - Negotiation Requirements - Validation Requirements.
Requirements Modeling: Requirements Analysis - Scenario Based Modeling - Class Based Modeling.
Requirements Modeling, Flow, Behavior, Patterns and WebApps: Requirement Modeling Strategies - Flow-Oriented Modeling - Requirements Modeling for WebApps.

Unit III:		

Design Concepts: Design Process - Concepts - Design Model.
Architecture Design: Software Architecture - Architectural Genres - Styles - Design.
Component level Design: Component - Class-based Components - Conduction Component-level Design - Component- level Design for WebApps.

Unit IV:		

Software Testing Strategies: Strategic approach for Software Testing - Strategies. for Conventional Software - Strategies for object - oriented software - Strategies. for Web Applications - Validation Testing - System Testing.
Testing Conventional Applications: Software Testing Fundamentals - Internal and External Views of Testing - White Box testing - Basis Path testing- Control Structure Testing - Black Box Testing - Testing for Specialized Environments and Applications.

Unit V:		

Project Management Concepts: Management Spectrum-People - Product - Process - Project.
Process and Project Metrics: Software Measurement - Metrics for Software Quality.
Project Scheduling: Basic Concepts - Project Scheduling – Taskset for the Software Project - Task Network - Scheduling.

Outcomes:		
1. Develops ability to understandsoftware product using different software process models and agile programming. 2. Understands requirements modeling. 3. Develops an overview of concepts of designengineering. 4. Familiarizes with software testing strategies. 5. Learns about an overview of project management and scheduling.		
Text Book:		
Software Engineering A Practitioner's Approach, Roger S Pressman, Seventh Edition, McGrawHill.		
References:		
1. An Integrated Approach to Software Engineering: Pankaj Jalote, Second edition, Arosha Publications. 2. Software Engineering: Ian Summerville, Fifth Edition, Pearson Education.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III
(Elective-II)

MCA2.1.5: EMBEDDED SYSTEMS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:		
1. To study the basics of embedded systems and its examples. 2. To study the 8051 Microcontroller architecture and its instruction set. 3. To discuss various software architectures in embedded systems. 4. To discuss Inter Task Communication procedures in RTOS and design issues of RTOS. 5. To study various embedded software development tools and debugging techniques.		
	SYLLABUS	
Unit I:		
Introduction- Definition & Examples of Embedded Systems (Ch 1 of Text 2) Microprocessors and Micro controllers- The 8051 Architecture (Ch 1- Ch 3 of Text 1)		
Unit II:		
8051 Assembly Language Programming: Moving Data- Arithmetic and Logical Operations- Jump and Call Instructions (Ch5- Ch6- Ch7- Ch8of Text 1)		
Unit III:		
Interrupts and Survey of Software Architectures (Ch 4- Ch 5 of Text 2)		
Unit IV:		
Introduction to Real-Time Operating Systems (Ch 6 of Text 2) More Operating System Services (Ch 7 of Text 2**)**		
Unit V:		
Embedded Software Development Tools (Ch 9 of Text 2) Debugging Techniques (Ch 10 of Text 2)		
Outcomes:		
1. Understands the basics of Embedded systems, Microprocessors and Microcontrollers. 2. Develops ability to write programs using 8051 Assembly Language instructions. 3. Learns about various Interrupts and Software Architecture. 4. Analyzes various design issues of RTOS. 5. Familiarizes with embedded software development tools and debugging techniques.		
Text Book:		
1. The 8051 Micro controllers- Architecture- Programming- & Applications- by Kenneth J. Ayala- Penram International Publishing (India)- Second Edition1996. 2. An Embedded Software Primer- David E. Simon- Pearson Education Inc.- 1999.		
References:		
1. Embedded Systems- Architecture- Programming and Design- by Raj Kamal TMH- 2003. 2. Embedded Real Time Systems Programming- by Sriram V Iyer and Pankaj Gupta-TMH-2004.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III
(Elective-II)

MCA2.1.5: COMPILER DESIGN

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To describe the process involved in a compiler and provide an overall view of various types of translators, linkers, loaders, and phases of a compiler design.
2. To understand and create lexical rules and grammars for a programming language.
3. To understand various parsing techniques such as LR parsers, SLR Parsers, CLR Parsers and LALR parsers.
4. To know how to improve the code to make it consume less resources using code-optimization and code generation techniques.

SYLLABUS

Unit I:

Introduction: Compiler & translators- Structure of compiler- Lexical Analyzer- Syntax Analyzer-Intermediate code generator. Optimization- code generation- Error handling-compiler writing tools structures of high-level language- The Syntactic specification of programming Languages.

Unit II:

Lexical Analysis: Lexical Analyzer- approaches to design of Lexical Analyzer- regular expression- finite automata- language for specifying Lexical Analyzer- Implementation of a Lexical Analyzer.

Unit III:

Parsing Techniques: 1 Parsers- Shift reduces parsing- operator – precedence parsing- Top-Down parsing-predicative parsing.
Parsing Techniques: 2 LR parsers: Construction of SLR Parser-Construction of CLR Parser-Construction of LALR Parser.

Unit IV:

Syntax Directed Translation: Syntax directed translator schemes and implementation-intermediate code- postfix notation- three addresses coding- quadruple & triple- translation of assignment statements-Boolean expression- Conditional statements- Postfix translations-array reference- Procedure calls- case statements- record structures.

Unit V:

Code Optimization: Sources of Optimization- Loop Optimization- DAG representation. Global Data Flow Analysis.
Code Generation: Problems in code generation. Simple code generator- code generator from DAG's- Peephole optimization. Brief description of Symbol tables- Error detection and recovery- Runtime storage administration.

Outcomes:

1. Familiarizes with fundamental concepts of compiler design.
2. Ability to design a Lexical Analyzer.
3. Learns about various parsing techniques in compiler design.
4. Develops knowledge on various compiler construction tools.
5. Applies code optimization and generation techniques in design.

Text Book:

Principles of compiler design by Alfred V. Aho- D. Ullman.

References:		
1. Compiler Design- Trembly and Sorauson- Tata Mcgraw Hill. 2. Systems programming by John. J. Donovan (chapter 8) 3. Theory of Computer science by K.L.P. Mishra &N. Chandra Sekhran (chapter 2-3-4) 4. Compiler Design in C – Allen I. Holub- PHI.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)

M.C.A-Semester III

MCA2.1.6: GRAPHICS AND MULTIMEDIA LAB

Credits: 3	Theory: -	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:

1. To make students aware of the concepts underlying modern Computer Graphics and Machine Vision
2. At the end of the course the student will have the generic skills to design algorithms for digital image synthesis for a broad-based set of computing problems in various domains.
3. This course contains 2D geometric transformations, Algorithms for clipping, 3D geometric and modeling transformation, Illumination models and surface rendering methods etc.
4. Understand the practical implementation of modeling, rendering, viewing of objects in 2D.

SYLLABUS

Cycle I (The programs are to be done through C)

5. Breshenham's Line drawing algorithm
6. Circle Generation
7. Ellipse Generation
8. Matrix Representation of a in 2-D
   - Translation
   - Rotation
   - Scaling
9. Line Clipping Algorithm
10. Polygon Clipping Algorithm

Cycle II (The Following programs are to be done in Flash MX 2004).

1. Assigning Actions to an Object- and a Button
2. Creating Loops
3. Generation Random Numbers
4. Creating a Function- Calling a Function
5. Detecting the Player Version
6. Detecting the Operating System
7. Checking the System language
8. Detecting Display Settings
9. Tinting a Movie Clip's Color
10. Controlling a Movie Clip's Color with Slide show
11. Drawing a Circle
12. Drawing a Rectangle
13. Filling a Shape with a Gradient
14. Scripting Masks
15. Converting Angle Measurements
16. Calculating the Distance between the Two Points
17. Formatting Currency Amount
18. Converting Between Units of Measurement
19. Determining Points along a Circle
20. Sorting or Reversing an Array
21. Implementing a Custom Sort
22. Creating a Text Field
23. Making a Password Input field.

Outcomes:		
1. Understands the basic concepts of computer graphics. 2. Practices scan conversion algorithms using C++ programming. 3. Learns to implement transformations on object using 2D-Transformations. 4. Applies clipping techniques for modifying an object. 5. Exhibits Flash programming skills.		
References:		
1. Action Script Cookbook- Joey Lott- SPD-Oreilly. 2. Flash MX Action Script for designers- Doug Sahlin-Dreamtech Wiley. 3. Flash MX Professional 2004 Unleashed- David Vogeleer and Matthew Pizzi- Pearson Education. 4. Computer graphics by Hearn and Barker.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester III

MCA2.1.7: DATABASE MANAGEMENT SYSTEMS LAB

Credits: 2	LAB: 3 Hours	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:

1. The major objective of this lab is to provide a strong formal foundation in database concepts, technology and practice to the participants to groom them into well-Informed database application developers.
2. To present SQL and procedural interfaces to SQL comprehensively
3. To present the concepts and techniques relating to query processing by SQL Engines.
4. To understand and use data manipulation language to query, update, and manage a Database.
5. To present the concepts and techniques relating to ODBC and its Implementations.
6. To design and build a simple database system and demonstrate competence with the Fundamental tasks involved with modeling, designing, and implementing a DBMS.

SYLLABUS

Cycle-I

1. Creation- altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.
2. Queries (along with sub Queries) using ANY- ALL- IN- EXISTS- NOTEXISTS- UNION- INTERSET- Constraints. Example: - Select the roll number and name of the student who secured fourth rank in the class. Queries using Aggregate functions (COUNT- SUM- AVG- MAX and MIN)- GROUP BY- HAVING and Creation and dropping of Views.
3. Queries using Conversion functions (to_char- to_number and to_date)- string functions (Concatenation- lpad- rpad- ltrim- rtrim- lower- upper- initcap- length- substr and instr)- date functions (Sysdate- next_day- add_months- last_day- months_between- least- greatest- trunc- round- to_char- to_date).

Cycle-II

1. Creation of simple PL/SQL program which includes declaration section- executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found).
2. Insert data into student table and use COMMIT- ROLLBACK and SAVEPOINT in PL/SQL block.
3. Develop a program that includes the features NESTED IF- CASE and CASE expression.

Cycle-III

1. Program development using WHILE LOOPS- numeric FOR LOOPS- nested loops using ERROR Handling- BUILT –IN Exceptions- USE defined Exceptions- RAISE-APPLICATION ERROR.
2. Programs development using creation of procedures- passing parameters IN and OUT of PROCEDURES.
3. Program development using creation of stored functions- invoke functions in SQL Statements and write complex functions.

Cycle-IV

1. Develop programs using features parameters in a CURSOR- FOR UPDATE CURSOR-WHERE CURRENT of clause and CURSOR variables.
2. Develop Programs using BEFORE and AFTER Triggers- Row and Statement Triggers and INSTEAD OF Triggers.

Mini Project.

Outcomes:		
1. Practices DDL, DML, DCL commands. 2. Design and implement a database schema for a given problem-domain and normalize a database. 3. Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS. 4. Practice PL/SQL programming. 5. Familiarizes with database connectivity.		

Syllabi

With effect from 2016-17 admitted batch

II YEAR II SEMESTER

IV Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA2.2.1	Web Technologies	4	--	70	30	100	4
MCA2.2.2	Object Oriented Analysis and Design with UML	4	--	70	30	100	4
MCA2.2.3	Data Communications and Computer Networks	4	--	70	30	100	4
MCA2.2.4	Elective – III: i) Bio-Informatics ii) Image Processing iii) E-Commerce Technologies iv) Distributed Systems	4	--	70	30	100	4
MCA2.2.5	MOOCS-I	4	--	70	30	100	2
MCA2.2.6	Web Technologies Lab	--	3	50	50	100	2
MCA2.2.7	Data Communications and Computer Networks Lab	--	3	50	50	100	2
Total		**20**	**6**	**450**	**250**	**700**	**22**

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester IV

MCA2.2.1: WEB TECHNOLOGIES

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1.Understand the principles of Web based application development.
2. Design dynamic content in Web Pages using JavaScript and XML.
3. Understanding the concepts of java Servlets, java Server Pages and design applications using them.
4. Understand the concepts of Component development and design applications by establishing connections to Databases.
5. Understand the concepts of PHP and design applications.

	SYLLABUS	
Unit I:		

HTML Common tags: Introduction – List – Tables – Images – Forms – Frames - Cascading Style sheets - Document Object model - Presenting XML - Using XML Parsers: DOM and SAX.

Unit II:		

Web Servers and Servlets: Tomcat web server - Introduction to Servlets - Lifecycle of a Servlet – JSDK - The Servlet API - The javax. servlet Package - Reading Servlet parameters - Reading Initialization Parameters - The javax. servlet HTTP package - Handling Http Request & Responses - Using Cookies- Session Tracking - Security Issues.

Unit III:		

Introduction to JSP: The Problem with Servlet - The Anatomy of JSP Page - JSP Processing – JSP Application Design with MVC Architecture - Setting Up and JSP Environment - Installing the Java Software Development Kit - Tomcat Server & Testing Tomcat - JSP Application Development - Generating Dynamic Content - Using Scripting Elements - Implicit JSP Objects.

Unit IV:		

Database Access: Database Programming using JDBC - Studying Javax.sql. * package - Accessing a Database from a JSP Page - Application–Specific Database Actions - Deploying JAVA Beans in a JSP Page - Introduction to struts framework.

Unit V:		

Introduction to PHP: Basic Syntax, Defining variable and constant, PHP Data type, Operator and Expression; Handling Html Form with PHP: Capturing Form Data, Dealing with Multi-value filed, Generating File uploaded form, redirecting a form after submission; Decisions and loop; Function; Strings; Arrays; Working with file and Directories: Understanding file& directory, Opening and closing a file, Copying ,renaming and deleting a file, Working with directories, Building a text editor, File Uploading & Downloading.

Outcomes:		

1. Ability to construct web-based applications using Java script and XML.
2. Learns to design application using java Servlets.
3. Develops competency to design sophisticated Java Server Pages.
4. Understands the concepts of JDBC connectivity.
5. Gains knowledge on designing applications using PHP.

Text Book:		

1. Web Programming- building internet applications- Chris Bates 2nd edition- WILEY Dreamtech.
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Scheldt. TMH
3. Java Server Pages –Hans Bergsten- SPD O'Reilly.

References:		
1. Web Technologies by Y. Ramesh Babu- Overseas Publishers Pvt.Ltd. 2. Programming world wide web-Sebesta- Pearson 3. Core SERVLETS AND JAVASERVER PAGES VOLUME1: CORE TECHNOLOGIES by Marty Hall and Larry Brown Pearson 4. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia. 5. Jakarta Struts Cookbook- Bill Siggelkow- S P D O'Reilly for chap-8. 6. Murach's beginning JAVA JDK 5- Murach- SPD 7. Professional PHP4, Luis Argerich, WROX, SDP		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester IV

MCA2.2.2: OBJECT ORIENTED ANALYSIS AND DESIGNWITH UML

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1.To understand the importance and basic concepts of object-oriented modeling.
2.To specify, analyze and design the use case driven requirements for a particular system.
3.To model the event driven state of object and transform them into implementation specific layouts.
4.To Identify, Analyze the subsystems, various components and collaborate them interchangeably.

SYLLABUS

Unit I:

Object-Oriented Systems Development Life Cycle: Introduction-The Software Development Process-Building High-Quality Software-Object-Oriented Systems Development - A Use-Case Driven Approach-Object-Oriented Analysis - Use-Case Driven-Object-Oriented Design-Prototyping-Implementation: Component- Based Development-Incremental Testing.**Object-Oriented Methodologies**: Introduction-Rumbaugh Modeling Technique-The Booch Methodology-The Jacobson Methodologies-Patterns-Frameworks- The Unified Approach.

Unit II:

Unified modeling language: Introduction-Static and Dynamic Models-Why Modeling-Introduction to the unified modeling language-UML Diagrams-UML Class Diagram-Use-Case Diagram-UML Dynamic Modeling-Model management: Packages and Model organization-UML Extensibility-UML Meta–Model.

Unit III:

Object-oriented Analysis Processes: Identifying Use-Cases: Introduction-Why Analysis is Difficult Activity-Business Object Analysis-Use Case Driven Object-Oriented Analysis-Business Process Modeling-Use-Case Model-Developing Effective Documentation. **Object Analysis:** Introduction-Classifications Theory-Approaches for identifying classes-Noun Phrase Approach. **Identifying Object Relationships- Attributes- and Methods:** Introduction-Associations-Super-Sub Class Relationships-A-Part-of Relationships-Aggregation-Identifying Attributes and Methods-Defining Attributes by Analyzing Use Cases and Other UML Diagrams – Object responsibility: methods and messages.

Unit IV:

Object oriented Design Process and Design –Axioms: Introduction-Object-Oriented Design process - Object-oriented Design Axioms - Corollaries - Design Patterns. **Designing Classes: I**ntroduction-The Object-oriented Design Philosophy-UML Object Constraint Language-Designing Classes: The Process - Class Visibility - Designing Classes: Refining Attributes.

Unit V:

Software Quality Assurance: Introduction-Quality Assurance Tests-Testing Strategies-Impact of Object orientation on Testing-test cases-Test plan-Continuous Testing-Myer's Debugging principles.

Outcomes:		
1. Develops knowledge on various object-oriented methodologies. 2. Understands UML Modeling. 3. Learns various analysis techniques. 4. Applies the concepts of architectural design using corollaries and axioms. 5. Familiarizes with Testing Strategies.		
Text Book:		
1.Object-Oriented Systems Development- Ali Bahrami McGrawHill- 1999.		
References:		
1. Craig Larman: Applying UML and Patterns- Pearson Education- 2002. 2. Grady Booch: Object-oriented analysis and design- Addison – Wesley- 1994. 3. D Jeya Mala-S Geetha- Object Oriented Analysis and Design Using UML –TMG- May 2013.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester IV

MCA2.2.3: DATA COMMUNICATIONS AND COMPUTER NETWORKS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To provide a solid foundation of the basics of data communication.
2. To prepare students to know the characteristics and designs of types of computer networks and their applications
3. Learn how computer network hardware and software operate
4. Investigate the fundamental issues driving network design
5. Learn about dominant network technologies.

	SYLLABUS	
Unit I:		
Introduction: Study of Data Communications-Data Communication- Networks-Protocols and Standards-Standards Organizations-**Basic Concepts: L**ine Configuration Topology-Transmission mode Categories of Networks - Internetworks-T**he OSI Model**: The Model-Functions of the layers-TCP/IP Protocol Suite. **Encoding and Modulating**: Digital-to-Digital conversion-Analog-to-Digital conversion Digital-to-Analog conversion Analog-to-Analog conversion.		
Unit II:		
Transmission Media: Guided Media-Unguided Media-Transmission Impairment. **Error Detection and Correction:** Types of Errors-Detection- Vertical Redundancy Check (VRC) -Longitudinal Redundancy- Check (LRC) -Cyclic Redundancy Check (CRC) -Checksum-Error Correction-**Data Link Control: L**ine Discipline-Flow Control-Error control. **Local Area Networks:** Project 802-Ethernet-Other Ethernet networks-Token bus -Token Ring-**Switching:** Circuit Switching-Packet Switching-Message switching.		
Unit III:		
Point-to-Point Protocol (PPP): transition states-PPP layers- Link Control Protocol (LCP)-Authentication Network Control Protocol (NCP)-**Frame Relay:** Introduction-Frame relay operation-Frame relay layers Congestion Control-Leaky Bucket Algorithm-Traffic Control.		
Unit IV:		
Networking and Internetworking Devices: Repeaters - Bridges-Routers- Gateways – Other devices -Routing Algorithms -Distance Vector Routing-Link State Routing-**Transport Layer:** Duties of the Transport Layer-Connection-The OSI Transport Protocol. **Upper OSI Layers: S**ession Layer-Presentation Layer-Application Layer-**TCP/IP Protocol Suite: Part 1:** Overview of TCP/IP-Network Layer-Addressing-Subnetting-Other protocols in the network layer-Transport Layer.		
Unit V:		
TCP/IP Protocol Suite: Part 2- Application Layer: Client–Server Model-Bootstrap Protocol (bootp) and Dynamic Host-Configuration protocol (DHCP) -Domain Name System (DNS)-Telnet-File Transfer Protocol (FTP) -Trivial File Transfer Protocol (TFTP)-Simple Mail Transfer Protocol (SMTP)-Simple Network Management Protocol (SNMP)-Hypertext Transfer Protocol (HTTP)-World Wide Web (WWW).		

Outcomes:		
1. Understands the overview of Data Communications and Networks. 2. Performs a thorough study of physical and data link layers. 3. Familiarizes with frame formats of data link layer. 4. Gains knowledge about network and transport layer functionalities. 5. Learns practical applications of networks.		
Text Book:		
Data Communications and Networking- Behrouz A. Forouzan- 2nd Edition revised- Tata Mcgraw- Hill Publishing Co.		
References:		
1. Understanding Data Communications and Networks- William A Shay- 2nd Edition- Vikas Publishing House. 2.Computer Networks- Andrew S. Tanenbaum- Pearson Education- Low Price- 4th Edition. 3.Data and Computer Communications- Williams Stallings- Prentice-Hall India- Eastern Economy Edition- 7thedition. 4.Data Communications- Computer Networks and Open Systems- Fred Halsall- Pearson Education- Low Price- Edition- 4th edition- 2001.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester IV
(Elective-III)

MCA2.2.4: BIOINFORMATICS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. The basic objective is to give students an introduction to the basic practical techniques of bioinformatics.
2. Emphasis will be given to the application of bioinformatics and biological databases to problem solving in real research problems
3. The students will become familiar with the use of a wide variety of internet applications, biological database.
4. Students will be able to apply these methods to research problems.

SYLLABUS

Unit I:

Introduction to Bioinformatics, Definition of Bioinformatics, Importance and Applications of Bioinformatics, three levels of Bioinformatics in structural Biology. Definitions, Sequencing, Biological sequence/structure, Genome Projects, Pattern recognition an prediction, Folding problem, Sequence Analysis, Homology and Analogy.

Unit II:

Protein Information Resources Biological databases, Primary sequence databases, Protein Sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases. Biological Databases Introduction, database types, sources on the web for some important data, Sequence Databases, and protein sequence levels, nucleic acid sequence database.

Unit III:

DNA Sequence analysis -Importance of DNA analysis, Gene structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases.

Unit IV:

Multiple Sequence Analysis -String, Edit Distance between two strings, Global alignment, local alignment, parametric alignment and applications, sub optimal alignment, multiple alignment, algorithm in multiple alignment, alignment through ClustalW, profile.

Unit V:

Analysis packages-Analysis package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

Outcomes:

1. Ability to understand the importance and applications of Bioinformatics.
2. Familiarizes with various biological databases.
3. Understands the DNA Sequence analysis and its importance.
4. Learns pair wise and multiple sequence alignment to predict the secondary and tertiary structures of protein sequences.
5. Gains knowledge on various analysis packages and its structure.

Text Book:

1. Introduction to Bioinformatics, T K Attwood & D J Parry-Smith, Addison Wesley Longman.
2. Bioinformatics, C.S. Murthy, Himalaya Publishing House.
3. Bioinformatics: A modern approach, VittalR.Srinivas.PHI.

References:		
1.Bioinformatics- A Beginner's Guide, Jean-Michel Claveriw, CerdricNotredame, WILEY DreamTech India Pvt. Ltd 2. Bioinformatics Sequence and Genome Analysis, Mount.D. W, Cold Spring Harber Press. 3. Algorithms of Strings Trees and Sequences, Gusfield.D., Cambridge University Press.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A Semester IV
(Elective-III)

MCA2.2.4: IMAGE PROCESSING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To explain fundamentals of Image processing concepts.
2. To provide mathematical foundation of image enhancement, image compression and image segmentation.
3. To explain the students about Morphology and its applications in image processing.
4. To explain various methods and techniques for image transformation.

SYLLABUS

Unit I:

Fundamental steps in Image Processing-Elements of Digital image processing systems-Digital image fundamentals. Uniform and Non-uniform sampling and quantization. Some basic relationships between pixels-Imaging Geometry.

Unit II:

Image Transforms – Introduction to Fourier Transform-DFT- Some properties of 2-D Fourier Transform-FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform and Hotelling transform.

Unit III:

Image enhancement (in spatial domain and frequency domain): Histogram processing. Spatial filtering. Image smoothing, Image sharpening.

Unit IV:

Image compression: Definition- A brief discussion on – Run length encoding, contour coding, Huffman code, compression due to change in domain, compression due to quantization Compression at the time of image transmission. Brief discussion on Image Compression standards.

Unit V:

Image Segmentation: Definition, characteristics of segmentation. Detection of Discontinuities, Thresholding Pixel based segmentation method. Region based segmentation methods – segmentation by pixel aggregation, segmentation by sub region aggregation, histogram-based segmentation, spilt and merge technique. Use of motion in segmentation (spatial domain technique only) –Morphology.

Outcomes:

1. Understands the fundamentals of Image processing concepts.
2. Ability to understand various image transformation techniques.
3. Acquires mathematical foundation on image enhancement.
4. Gains knowledge on image compression techniques.
5. Familiarizes with various methods of image segmentation and morphology.

Text Book:

1. Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education, 2nd Education,2002.

References:

1.Fundamentals of Digital Image processing – A.K. Jain,PHI.
2.Digital Image processing using MATLAB – Rafael C. Gonzalez, Richard EWoods and StevenL.Edition, PEA,2004.
3.Digital Image Processing – William K. Pratt, John Wilely, 3rd Edition, 2004.

Gayatri Vidya Parishad College for Degree and P.G Courses (Autonomous)
M.C.A Semester IV
(Elective-III)

MCA2.2.4: E-COMMERCE TECHNOLOGIES

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Demonstrate an understanding of the foundations and importance of E-commerce
2. Analyze the impact of E-commerce on business models and strategy.
3. Describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.
4. Discuss legal issues and privacy in E-Commerce.
5. Recognize and discuss Business Process Reengineering.

SYLLABUS

Unit I:

Introduction: Meaning- E-Commerce- E-business and E-marketing- Evolution of E-commerce - Internet and Web Technologies- online-processing- E-Commerce Business Models: Business to Business (B2B)- Business to Commerce (B2C)- Other Models – E-Business Store Fronts.

Unit II:

E-Commerce application: Supply Chain Management- Definition- Different Categories and Models of SCM- Elements of SCM- Procurement- Online-Marketing and Advertisement.

Unit III:

Electronic Data Interchange and Electronic Payment- Meaning- EDI Application in Business- type of E-Payments - E-cash- Digital Cash- E-Cheques- Credit cards- Smart cards- E-wallets and Debit cards.

Unit IV:

Electronic Security: E-security issues: Hacking- Spoofing and viruses- Network Security and Transaction Security- Security Measures Firewall- Encryption and Digital Signatures.

Unit V:

Business Process Reengineering: Introduction-What- Why and How to Reengineering-BPR Process-Biggest obstacles that reengineering faces are-Reengineering Recommendation-BPR Methodology-Change Management Strategy-Change Management Cycle.

Outcomes:

1. Learns about E-Commerce models and its evolution.
2. Understands the fundamental concepts of Supply Chain Management.
3. Ability to describe various E-Commerce payment systems.
4. Familiarizes with various E-security issues.
5. Gains knowledge on Business Process Reengineering.

References:

1. Introduction to Information Technology-Rajaraman- PHI
2. E-Commerce-Business: C.S. Rayudu- Himalaya Publishing House
3. Electronic Commerce-Efraim Turban: Pearson Education
4. E-Commerce- An Indian Perspective- Joseph- PHI
5. Fundamentals of Information Technology-Chetan Srivatsava-Kalyani Publications.
6. Creating a winning E-Business- Second Edition- H-Albert Napier.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester IV
(Elective-III)

MCA2.2.4: DISTRIBUTED SYSTEMS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To expose students to both the abstraction and details of file systems.
2. To introduce concepts related to distributed computing systems.
3. To focus on performance and flexibility issues related to systems design decisions.
4. To expose students to current literature in distributed systems.

SYLLABUS

Unit I:

Characterization of Distributed Systems: - Introduction, Examples of distributed systems, Resource sharing and the Web, Challenges. **System models**: - Introduction, Architectural models, Fundamental models. **Networking and Internetworking:** - Introduction, Types of network, Network principles, Internet protocols, Network case studies: Ethernet, Wireless LAN and ATM.

Unit II:

Interprocess communication: - Introduction, The API for the Internet protocols, External data representation and marshalling, Client-server communication, Group communication, Case study: Interproces communication in UNIX. **Distributed Objects and Remote Invocation**: - Introduction, Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study.

Unit III:

Distributed File Systems: - Introduction, File service architecture, Sun Network file system, The Andrew File System, Recent advances. **Name Services**: - Introduction, Name services and the Domain Name System, Directory and discovery services, Case study of the Global Name Service. **Time and Global States:** - Introduction, Clocks, events and process states, Synchronizing physical clocks, Logical time and logical clocks, Global states.

Unit IV:

Coordination and Agreement: - Introduction, Distributed mutual exclusion, Elections, Multicast communication. **Transactions and Concurrency Control:** - Introduction, Transactions, Nested transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

Unit V:

Distributed Transactions: - Introduction, Flat and nested distributed transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. **Replication:** - Introduction, system model and group communication, Transactions with replicated data.

Outcomes:

1. Gains basic knowledge on distributed systems and system models.
2. Ability to identify Distributed systems using various inter-process communication techniques.
3. Understands the concepts of Distributed File Systems.
4. Familiarizes with Transactions and Concurrency Control mechanisms.
5. Learns the importance of Replicated Data in transactions and group communications.

Text Book:

Distributed Systems Concepts and Design, George Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair, Fourth Edition, Pearson Education.

Gayatri Vidya Parishad College for Degree and P.G Courses (Autonomous)
M.C.A-Semester IV
MOOCS-I

MCA2.2.5: INTERNET OF THINGS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To understand how sensors and embedded systems work
2. To understand how to program on embedded and mobile platforms including ESP8266 and Android
3. To understand how to make sensor data available on the Internet.
4. To understand how to analyze and visualize sensor data.
5. To understand how to work as a team and create end-to-end IoT applications.

SYLLABUS

Unit I:

Introduction to IoT : Origin of Terminology-Machine to Machine (M2M)-Characteristics -IoT Market Share-Evaluation of Connected Devices -IoT Enablers- Connectivity Layers - Baseline Technologies - IoT vs. M2M -IoT vs. WoT-Terminological Interdependence -IoT Resulting in Address Crunch - Connectivity Terminologies -IoT Network Configurations - Gateway Prefix Allotment - Impact of Mobility on Addressing - Gateways - Multi- homing - IPv4 -IPv6.

Sensing: Definition - Sensors - Transducers - Sensor vs. Transducer - Sensor Features - Sensor Resolution - Sensor Classes - Analog Sensors - Digital Sensors - Scalar Sensors - Vector Sensors - Sensor Types - Sensorial Deviations - Non-linearity.

Actuation: Actuator - Actuator Types - Hydraulic Actuators - Pneumatic Actuators - Electric Actuators - Thermal or Magnetic Actuators - Mechanical Actuators - Soft Actuators

Unit II:

Basics of IoT Networking : Convergence of Domains - IoT Components - Functional Components of IoT - IoT Interdependencies - IoT Service Oriented Architecture - IoT Categories - IoT Gateways - IoT and Associated Technologies - Technical Deviations from Regular Web - Key Technologies for IoT - IoT Challenges - Considerations - Complexity of Networks - Wireless Networks - Scalability - Functionality-based IoT Protocol Organization - MQTT - Introduction - MQTT Methods - Communication - MQTT Topics - Applications - SMQTT - CoAP - Introduction - CoAP Position - CoAP Message Types - CoAP Request-Response Model - Features.

Unit III:

Connectivity Technologies: Communication Protocols - IEEE 802.15.4 - Features of IEEE 802.15.4 - IEEE 802.15.4 Variants - IEEE 802.15.4 Types - IEEE 802.15.4 Frames - Beacon Enabled Networks - Non-Beacon Enabled Networks - Zigbee - Features of ZigBee - Important Components - ZigBee Topologies - ZigBee Mesh - ZigBee Types - ZigBee Network Layer - Applications. 6LoWPAN - Introduction - Features of 6LoWPANs - Addressing in 6LoWPAN - 6LowPAN Packet Format - Header Type. RFID - Introduction - RFID Features - Working Principle – Applications - Sensor Networks- Machine-to-Machine Communications.

Unit IV:

Interoperability in IoT, Introduction to Arduino Programming - Integration of Sensors and Actuators with Arduino - Introduction to Raspberry Pi- Implementation of IoT with Raspberry Pi- Introduction to SDN - SDN for IoT- Data Handling and Analytics- Cloud Computing- Cloud Computing Sensor-Cloud- Fog Computing- Smart Cities and Smart Homes.

Unit V:

Connected Vehicles- Smart Grid- Industrial IoT- Case Study- Agriculture, Healthcare, Activity Monitoring.

Outcomes:		
1. Understands the concepts and devices of IoT. 2. Familiarizes with IoT networking basics. 3. Learns about various connectivity protocols and their applications. 4. Ability to design IoT applications using Arduino programming. 5. Understands the role of big data and cloud computing in IoT.		
Text Book:		
1. "The Internet of Things- Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)		
References:		
1. "Internet of Things- A Hands-on Approach", by ArshdeepBahga and Vijay Madisetti (Universities Press)		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester IV

MCA2.2.6: WEB TECHNOLOGIES LAB

Credits: 2	Theory: 3 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1.Understand the principles of Web based application development.
2. Design dynamic content in Web Pages using JavaScript and XML.
3. Understanding the concepts of java Servlets, java Server Pages and design applications using them.
4. Understand the concepts of Component development and design applications by establishing connections to Databases.
5. Understand the concepts of PHP and design applications.

SYLLABUS

1. Introduction:
   - Introduction to HTML
   - Introduction to Java Script
   - Introduction to XML
2. Feedback Form using HTML tags
3. Develop Web-site using only HTML Tags and Cascading style sheets
4. DHTML Programs
   - 4.1 Color Picker
   - 4.2 Rollover Buttons
5. Java Script Programs
6. XML Programs
7. Installation and Running of Tomcat Server
8. Servlet Programs
   - 8.1 Displaying simple text
   - 8.2 Validating user's login information by parameter passing
   - 8.3 Handling http request and response
   - 8.4 Handling cookies
   - 8.5 Session tracking
9. JSP Programs
   - 9.1 Displaying simple text
   - 9.2 Validating user's information by conditional processing
   - 9.3 Session tracking
10. PHP Programs
    - 10.1 Displaying simple text
    - 10.2 Validating user's information by conditional processing

Outcomes:

1. Practices web-based applications using Java script and XML.
2. Execute applications using java Servlets.
3. Become skilled at database connectivity.
4. Exhibit application development using PHP.
   Create applications using java server pages.

Text Book:

1. Web Programming- building internet applications- Chris Bates 2nd edition- WILEY Dreamtech.
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Scheldt. TMH
3. Java Server Pages –Hans Bergsten- SPD O'Reilly.

References:		
1. Web Technologies by Y. Ramesh babu- Overseas Publishers Pvt.Ltd. 2. Programming world wide web-Sebesta- Pearson 3. Core SERVLETS AND JAVASERVER PAGES VOLUME1: CORE TECHNOLOGIES by Marty Hall and Larry Brown Pearson 4. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia. 5. Jakarta Struts Cookbook- Bill Siggelkow- S P D O'Reilly for chap-8. 6. Murach's beginning JAVA JDK 5- Murach- SPD. 7. Professional PHP4, Luis Argerich, WROX, SDP		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester IV

MCA2.2.7: DATA COMMUNICATIONS AND COMPUTER NETWORKS LAB

Credits: 2	Lab: 3 Hours	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:

1. Build an understanding of the fundamental concepts of computer networking.
2. Preparing the student for Advanced courses in computer networking.
3. Allow the students to gain expertise in some specific tools of Networking.
4. Allow the students to gain expertise in some specific Networking Simulators.

SYLLABUS

FIRST CYCLE OF EXPERIMENTS

1. PC-to-PC COMMUNICATIONS UNDER WIN 98's DIRECT CABLE CONNECTION with NULL MODEM
   a) Using Serial Ports and RS-232 C Cable Connection
   b) Using Parallel Ports and Parallel Cable Connection
2. PC-to-PC COMMUNICATIONS UNDER WIN 98's DIAL-UP NETWORKING WITH MODEM and 4-LINE EXCHANGE
3. PC-to-PC COMMUNICATIONS UNDER WIN 98's HYPER TERMINAL WITH MODEM and 4-LINE EXCHANGE
4. THIN ETHERNET LAN WITH STAR TOPOLOGY with a minimum of two systems Windows Peer-to-Peer Network
5. THIN ETHERNET LAN WITH STAR TOPOLOGY with a minimum of two systems Windows NT Client-Server Network
6. THIN ETHERNET LAN WITH STAR TOPOLOGY with a minimum of two systems Novell Client-Server Network

SECOND CYCLE OF EXPERIMENTS

7. Study of Network Devices in Detail.
8. Configure a Network topology using packet tracer software.
9. Socket Programming
   a. TCP Sockets b. UDP Sockets
10. Simulation of any **1** Routing Protocols.
11. Protocol Analysis of TCP- UDP- and IP using TTCP tool.

Outcomes:

1. Understands the difference between serial communication and parallel communication with direct cable software component.
2. Learns the importance of Dialup networking and HyperTerminal.
3. Ability to grasp the knowledge for different network configurations using star Topology.
4. Acquires knowledge of using Cisco-packettracer simulator by configuring the different applications.
5. Practices socket programming using TCP and UDP.

MASTER OF COMPUTER APPLICATIONS

Syllabi

With effect from 2016-17 admitted batch

III YEAR I SEMESTER

V Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA3.1.1	Network Security	4	--	70	30	100	4
MCA3.1.2	Data Warehousing and Mining	4	--	70	30	100	4
MCA3.1.3	Dot Net Technologies	4	--	70	30	100	4
MCA3.1.4	Elective IV: i) Big Data Analytics ii) Cloud Computing iii) Mobile Computing iv) Wireless Ad-hoc Networks	4	--	70	30	100	4
MCA3.1.5	MOOSC-II	--	--	--	--	100	4
MCA3.1.6	Data Mining and Warehousing Lab	--	3	50	50	100	2
MCA3.1.7	Dot Net Technologies Lab	--	3	50	50	100	2
Total		**16**	**6**	**450**	**250**	**700**	**24**

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester V

MCA3.1.1: NETWORK SECURITY

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Introduction of the importance of various services of network security.
2. To discuss various cryptographic techniques.
3. Exploration of different types of security threats and remedies and understanding of internet security protocols and standards.
4. To introduce types of malicious software and issues.

	SYLLABUS	
Unit I:		

Overview: Computer Security Concepts, The OSI Security Architecture, Security Attacks, Security Services, Security Mechanisms, A Model for Network Security. **Classical Encryption Techniques**: Symmetric Cipher Models, Substitution Techniques, Stegnography. **Block Ciphers and The Data Encryption Standard:** Stream Ciphers and Block Ciphers, The Data Encryption Standard (DES), A DES Example, The Strength of DES. **Advanced Encryption Standard: AES** Structure, AES Transformation Functions, AES Key Expansion, **IDEA**. **Block Cipher Operations**: Multiple Encryption and Triple DES, Electronic Code Book, Cipher Block Chaining Mode, Cipher Feedback Mode, Output Feedback Mode, Counter Mode.

Unit II:		

Public-Key Cryptography And RSA: Principles of Public Key Cryptosystems, The RSA Algorithm. **Other Public-Key Cryptosystems:** Diffie-Hellman Key Exchange, Elliptic curve Cryptography. **Cryptographic Hash Functions**: Applications of Cryptographic Hash Functions, Secure Hash Algorithm (SHA-1). **Digital Signatures:** Digital Signatures, NIST Digital Signature Algorithm.

Unit III:		

Key Management and Distribution: Symmetric Key Distribution using Symmetric Key Encryption, Symmetric Key Distribution using Asymmetric Key Encryption, Distribution of public Keys, X.509 Certificates, Public-Key Infrastructure. **User Authentication**: Remote User-Authentication Principles, Kerberos.

Unit IV:		

Transport-Level Security: Web Security Considerations, Secure Socket Layer and Transport Layer Security, Transport Layer Security. **Electronic Mail Security**: Pretty Good Privacy, S/MIME.

Unit V:		

IP Security: Overview, IP Security Policy, Encapsulating Security Payload, Combining Security Associations.**Intruders:** Intruders, Intrusion Detection, Password Management. **Malicious Software:** Types of Viruses, Virus Countermeasures, Worms, Distributed Denial Of Service Attacks.

Outcomes:		

1. Learns and understands the importance of cryptography.
2. Familiarizes with the algorithms of various security services.
3. Ability to understand various key management and authentication techniques.
4. Understands various cryptographic algorithms for e-mail security and transport-level security.
5. Gains knowledge about IP-security, malicious software and related attacks.

Text Book:		

Cryptography and Network Security Principles and Practice, William Stallings, Sixth Edition, Pearson Education.

References:		
1.Network Security Essentials Applications and Standards, Wililium Stallings, Fourth Edition, Pearson Education. 2.Cryptography and Network Security Behrouz a Frorouzan, First Edition, Tata McGraw Hill Pub Company Ltd, New Delhi. 3.Network Security Private Communication in a Public World, Charlie Kaufman Radia Perlman & Mike Speciner, Pearson Education / Prentice Hall of India Private Ltd New Delhi.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-Semester V

MCAS3.1.2: DATA MINING AND DATA WAREHOUSING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. To understand the evolution of data warehousing and data mining systems
2. To understand extracting, cleaning and transformation of data into a warehouse.
3. To learn the principles of statistics, information theory, machine learning and other areas AI and implementation of data mining techniques.
4. To understand pattern mining using classification and clustering methods.

SYLLABUS

Unit I:

Introduction to Data Mining: Introduction-What is Data Mining? -Relational Databases-Data Warehouses-Transactional Databases- Advanced Database Systems and Advanced Database Applications-Data Mining Functionalities-Classification of data mining systems-Data Mining task primitives-integration of data mining system with a database or Data Warehouse System-Major issues in Data Mining

Unit II:

Data Preprocessing: Why Pre-process the Data? Data Cleaning-Data Integration and Transformation-Data Reduction-Discretization and Concept Hierarchy Generation.

Data Warehouse and OLAP Technology for Data Mining: What is Data Warehouse? -Multi-Dimensional Data Model-Data Warehouse Architecture-Data Warehouse Implementation-From Data Warehousing to Data Mining.

Unit III:

Mining Frequent Patterns- Associations and Correlations: Basic concepts and Road Map-Efficient and scalable frequent item set methods-Mining various kinds of association rules-Mining multi-level association rules from transactional data bases-Mining multi-dimensional association rules from relational databases and data warehouses-From Association Mining to Correlation Analysis-Constraint Based Association Rule Mining.

Unit-IV:

Classification and Prediction: Concepts and Issues regarding Classification and Prediction-Classification by Decision Tree Induction-Bayesian Classification and Back Propagation-Prediction.

Unit V:

Cluster Analysis: What is Cluster Analysis: What is Cluster Analysis-A Categorization of Major Clustering Methods-Partitioning Methods: K-Means and K-Medoids-Hierarchical Methods: Agglomerative and Devisive Hierarchical Clustering-Outlier Analysis.

Outcomes:

1. Learns about data mining concepts and functionalities.
2. Familiarizes with various data preprocessing techniques.
3. Gains knowledge about association rule mining techniques.
4. Understands Classification and Prediction techniques.
5. Analyzes Clustering techniques.

Text Book:

Data Mining Concepts and Techniques- Jiawei Han and Micheline Kambler- Second edition- Morgan Kaufman Publications.

References:

1. Introduction to Data Mining- Adriaan - Addison Wesley Publication
2. Data Mining Techniques- A.K.Pujari- University Presss

Gayatri Vidya Parishad College for Degree and P.G Courses (Autonomous)
M.C.A-Semester V

MCA3.1.3: DOTNET TECHNOLOGIES

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. This course has been specifically designed to address the requirements of developers who want to become experts in .NET environment.
2. To introduce the students .NET framework technologies and features such as Common Language Runtime (CLR), .NET framework classes.
3. To develop web as well as desktop applications using technologies such as ADO.NET using .NET framework.
4. To learn how to apply .NET compliant languages to develop server-side applications which make use of ADO.NET, VB.NET, ASP.NET, Web Services etc.

	SYLLABUS	
Unit I:		

Introduction to .NET framework: Managed Code and the CLR- Intermediate Language, Metadata and JIT Compilation - Automatic Memory Management.Language Concepts- Visual Studio .NET - Using the .NET Framework - The Framework Class Library - .NET objects - ASP .NET - .NET web services – Windows Forms.

Unit II:		

Introduction to VB.Net: Elements, Variables and constants - data types declaration. Operators- types - precedence. Expressions. Program flow - Decision statements- if..then, if..then..else, select...case - Loop statements - while..end., whiledo..loop, for..next, for..each..next.

Types: Value data types- Structures, Enumerations. Reference data types- Single-dimensional - Multi-dimensional arrays - jagged arrays - dynamic arrays.

Windows programming: Creating windows Forms - windows controls - Button, Check box, Combo box, Label, List box, Radio Button, Text box. Events - Click, close, Deactivate, Load, Mousemove-Mousedown -MouseUp.

Menus and Dialog Boxes: Creating- menu items- context menu - Using dialog boxes-show Dialog () method, application development using ADO.net.

Unit III:		

Features of ADO.NET: Architecture of ADO.NET – ADO.NET providers – Connection - Command - Data Adapter - Dataset.

Accessing Data with ADO.NET: Connecting to Data Source, Accessing Data with Data set and Data Reader - Create an ADO.NET application - Using Stored Procedures.

Unit IV:		

ASP.NET Features: Change the Home Directory in IIS - Add a Virtual Directory in IIS- Set a Default Document for IIS - Change Log File Properties for IIS - Stop, Start, or Pause a Web Site. **Creating Web Controls:** Web Controls - HTML Controls, Using Intrinsic Controls, Using Input Validation Controls, Selecting Controls for Applications - Adding web controls to a Page.

Creating Web Forms: Server Controls - Types of Server Controls - Adding ASP.NET Code to a Page.

Unit V:		

Overview of XML: ML Serialization in the .NET Framework -SOAP Fundamentals-Using SOAP with the .NET Framework.

Introduction to web services: Web Services protocol and standards - WSDL Documents - Overview of UDDI - Calling a Web Service from a Browser - Calling a Web Service by Using a Proxy - Creating a simple web service - Creating and Calling a Web Service by Using Visual Studio .NET.

Outcomes:		
1. Learns the fundamental concepts of .NET framework and its features. 2. Ability to develop applications using VB.NET. 3. Gains knowledge about application development using ADO.NET. 4. Ability to develop web applications using ASP.NET. 5. Understands web service protocols WSDL, SOAP and UDDI.		
Text Book:		
Visual Basic .NET Programming, Black Book, 2005 Edition, Steven Holzner.		
References:		
1. Introduction to Visual basic.NET - NIIT Prentice Hall of India,2005 2. Introducing Microsoft .NET- David S. Platt Microsoft Press", Saarc Edition, 2001 3. Introduction to Microsoft® ASP.NET Work Book - Microsoft- Microsoft Press 4. Developing XML Web Services Using Microsoft® ASP.NET -Microsoft- Microsoft Press 5. Designing Microsoft ASP.NET Applications-Douglas J. Reilly-Microsoft Press 6. ASP.NET-Danny Ryan and Tommy Ryan-Hungry Minds Maran Graphics		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)

M.C.A Semester V

(Elective – IV)

MCA3.1.4: BIG DATA ANALYTICS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:		
1. Understand big data and Apache Hadoop Eco-system. 2. Understand distributed, parallel, cloud computing and SQL concepts. 3. Apply Hadoop concepts. 4. Understand concepts of map and reduce and functional programming.		
	SYLLABUS	
Unit I:		
Introduction to Big data: Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis – Nature of Data - Analytic Processes and Tools - Analysis vs Reporting – Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling -Statistical Inference - Prediction Error.		
Unit II:		
Data Analysis: Regression Modeling - Multivariate Analysis – Bayesian Methods – Bayesian Paradigm -Bayesian Modeling - Inference and Bayesian Networks - Support Vector and Kernel Methods - Analysis of Time Series: Linear Systems Analysis - Nonlinear Dynamics - Rule Induction - Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy Decision Trees		
Unit III:		
Introduction to Hadoop: Hadoop- definition-Understanding distributed systems and Hadoop-Comparing SQL databases and Hadoop- Understanding MapReduce- Counting words with Hadoop-running your first program-History of Hadoop-Starting Hadoop - The building blocks of Hadoop- NameNode- DataNode-Secondary NameNode-JobTracker and Task Tracker.		
Unit-IV:		
HDFS: Components of Hadoop -Working with files in HDFS-Anatomy of a MapReduce program-Reading and writing the Hadoop Distributed File system -The Design of HDFS-HDFS Concepts-The Command-Line Interface-Hadoop File system-The Java Interface-Data Flow-Parallel Copying with distcp- Hadoop Archives.		
Unit V:		
Tools and Frameworks: Apache Hive, MapR – Sharding – NoSQL Databases - S3 – Cloudera-MongoDB-Talend-Hadoop Distributed File Systems – Case Study.		
Outcomes:		
1. Gain conceptual understanding of analytics concepts, algorithms and statistical tests. 2. Gains knowledge on how to analyze data by using various classification and clustering techniques. 3. Understands how Hadoop can store and process the data and its architecture. 4. Ablility to learn how to read and write data in Hadoop distributed file system. 5. Familiarizes with modern data analytic tools of Big Data.		
Text Book:		
1.Dirk deRoos, Chris Eaton, George Lapis, Paul Zikopoulos, Tom Deutsch, "Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data", 1st Edition, TMH,2012. 2.Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reilly 3.Data Mining Concepts and Techniques, Jiawei Han and Kamber, Morgan Kaufman Publications.		

References:		
1. Hadoop in Action by Chuck Lam, MANNING Publ. 2. Hadoop in Practice by Alex Holmes, MANNING Publishers 3. Mining of massive datasets, AnandRajaraman, Jeffrey D Ullman, Wiley Publications.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)

M.C.A Semester V

(Elective – IV)

MCA3.1.4: CLOUD COMPUTING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. The objective of this course is to gain the in-depth knowledge of Cloud Computing concepts, technologies, architecture and applications.
2. To introducing and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations.
3. Another objective is to expose the students to frontier areas of Cloud Computing.

	SYLLABUS	
Unit I:		

Introduction to Cloud Computing: Cloud Computing in a Nutshell-Roots of Cloud Computing-Layers and Types of Clouds-Desired Features of a Cloud. **Migrating into a Cloud**: Introduction-Broad Approaches to Migrating into the Cloud-The Seven-Step Model of Migration into a Cloud. **Enriching the "Integration as a Service" Paradigm for the Cloud Era:** Introduction-The Onset of Knowledge Era-The Challenges of Seas Paradigm-Approaching the Seas Integration Enigma-New Integration Scenarios-The Integration Methodologies-Seas Integration Products and Platforms-Seas Integration Services.

Unit II:		

The Enterprise Cloud Computing Paradigm: Introduction-Issues for Enterprise Applications on the Cloud-Transition Challenges-Enterprise Cloud Technology and Market Evolution. **Virtual Machines Provisioning and Migration Services:** Introduction-Virtual Machines Provisioning and Manageability-Virtual Machine Migration Services. **On the Management of Virtual Machines for Cloud Infrastructures:** The Anatomy of Cloud Infrastructures--Distributed Management of Virtual Infrastructures-Scheduling Techniques for Advance Reservation of Capacity.

Unit III:		

Aneka—Integration of Private and Public Clouds: Introduction- Technologies and Tools for Cloud Computing- Aneka Cloud Platform- Aneka Resource Provisioning Service. **CometCloud: An Autonomic Cloud Engine:** Introduction—CometCloud Architecture-Autonomic Behavior of CometCloud- Overview of CometCloud-based Applications. **Workflow Engine for Clouds:** Introduction- Workflow Management Systems and Clouds-Architecture of Workflow Management Systems.

Unit-IV:		

An Architecture for Federated Cloud Computing: Introduction- A Typical Use Case-The Basic Principles of Cloud Computing- A Model for Federated Cloud Computing. **SLA Management in Cloud Computing A Service Provider's Perspective:** Traditional Approaches to SLO Management- Types of SLA- Life Cycle of SLA- SLA Management in Cloud.

Unit V:		

Best Practices in Architecting Cloud Applications in the AWS Cloud: Introduction-Cloud Concepts- GrepTheWeb Case Study. **Building Content Delivery Networks Using**

Clouds: Introduction- MetaCDN: Harnessing Storage Clouds for Low-Cost- High-Performance Content Delivery. **Resource Cloud Mashups:** Introduction- Concepts of a Cloud Mashup- Realizing Resource Mashups.

Outcomes:		

1. Understands cloud computing platforms and their migration issues.
2. Learns about Virtual Machines Provisioning and Scheduling Techniques.
3. Gains knowledge on Integration of Private and Public Clouds.
4. Familiarizes with Federated Cloud Computing Architecture.

Develops the knowledge of Architecting Cloud Applications in the AWS and Cloud Mashups.

Text Book:		

1."Cloud Computing: Principles and Paradigms" Rajkumar Buyya James Broberg Andrzej Goscinski - Pearson education.

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A Semester V
(Elective – IV)

MCA2.2.4: MOBILE COMPUTING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Define Mobile Computing and look at current trends
2. To learn about the concepts and principles of mobile computing;
3. To explore both theoretical issues of mobile computing;
4. To develop skills of finding solutions and building software for mobile computing applications.

SYLLABUS

Unit I:

Introduction to Mobile Communications and Computing: Introduction to cellular concept- Frequency Reuse- Handoff- GSM: Mobile services- System architecture- Radio interface- Protocols- Localization and calling- Handover- Security- and New data services- Introduction to mobile computing- novel applications- limitations- and architecture.

Unit II:

Wireless LANs: Introduction- Advantages and Disadvantages of WLANs- WLANTopologies- Introduction to Wireless Local Area Network standard IEEE 802.11- Comparison of IEEE 802.11a- b- g and n standards- Wireless PANs- Hiper LAN- Wireless Local Loop.

Unit III:

Wireless Networking: Introduction- Various generations of wireless networks- Fixed network transmission hierarchy- Differences in wireless and fixed telephone networks- Traffic routing in wireless networks- WAN link connection technologies- X.25 protocol- Frame Relay- ATM- Virtual private networks- Wireless data services- Common channel signaling- Various networks for connecting to the internet.

Unit IV:

Database Issues: Data management issues- data replication for mobile computers- adaptive clustering for mobile wireless networks- file system- disconnected operations.
Data Dissemination: Communications asymmetry- classification of new data delivery mechanisms- push-based mechanisms- pull-based mechanisms- hybrid mechanisms- selective tuning (indexing) techniques.

Unit V:

Mobile IP and Wireless Application Protocol: Introduction to Mobile IP- Introduction to Wireless Application Protocol- Application layer.

Outcomes:

1. Acquires concepts and features of cellular technologies and mobile services.
2. Gains knowledge on Wireless-LAN's and their standards.
3. Identifies the important issues of wireless networks and protocol mechanisms.
4. Learns the functionalities of database in mobile communications and issues.
5. Familiarizes with Mobile IP and Wireless Application Protocol.

Text Book:

1.Gottapu Sasibhushana Rao- "Mobile Cellular Communication"- Pearson Education- First Edition- 2013.
2.Stojmenovic and Cacute- "Handbook of Wireless Networks and Mobile Computing"- Wiley- 2002.

Gayatri Vidya Parishad College for Degree and P.G Courses (Autonomous)
M.C.A-SemesterV
(Elective – IV)

MCA3.1.4: WIRELESS ADHOC NETWORKS

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Understanding the Infrastructure less networks and their importance in the future directions for wireless communications.
2. Understanding the mathematical models and network protocol designs in wireless multi- hop networks.
3. Understanding a systematic exposition of network protocols and their cross-layer interactions.
4. A broad perspective on the active research areas in wireless multi-hop networks

SYLLABUS

Unit I:

Wireless LANS and PANS: Introduction- Fundamentals of WLANS- IEEE 802.11 Standard-HIPERLAN Standard- Bluetooth- Home RF. Wireless Internet: Wireless Internet-Mobile IP- TCP in WirelessDomain- WAP- Optimizing Web Over Wireless.

Unit II:

AD HOC Wireless Networks: Introduction- Issues in Ad Hoc Wireless Networks- AD Hoc Wireless Internet. MAC Protocols for Ad Hoc Wireless Networks: Introduction- Issues in Designing a MAC protocol for Ad Hoc Wireless Networks- Design goals of a MAC Protocol for Ad Hoc Wireless Networks- Classifications of MAC Protocols- Contention - Based Protocols- Contention Based Protocols with reservation Mechanisms- Contention – Based MAC Protocols with Scheduling Mechanisms- MAC Protocols that use Directional Antennas.

Unit III:

Routing Protocols: Introduction- Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks-Classification of Routing Protocols- Table- Driven Routing Protocols-On-Demand Routing Protocols - Hybrid Routing Protocols- Routing Protocols with Efficient Flooding Mechanisms-Hierarchical RoutingProtocols- Power –Aware Routing Protocols. Transport Layer and Security Protocols: Introduction-Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks- Design Goals of aTransport Layer Protocol for Ad Hoc Wireless Networks- Classification of Transport Layer Solutions-TCP Over Ad Hoc Wireless Networks- Other Transport Layer Protocol for Ad Hoc Wireless Networks-Security in Ad Hoc Wireless Networks.

Unit IV:

Quality of Service: Introduction- Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks-Classification of QoS Solutions- MAC Layer Solutions- Network Layer Solutions- QoS Frameworks forAd Hoc Wireless Networks. Energy Management: Introduction- Need for Energy Management in AdHoc Wireless Networks- Classification of Ad Hoc Wireless Networks- Battery Management Schemes-Transmission Power Management Schemes- System Power Management Schemes.

Unit V:

Wireless Sensor Networks: Introduction- Sensor Network Architecture- Data Dissemination- DataGathering- MAC Protocols for Sensor Networks- Location Discovery-Quality of a Sensor Network.

Outcomes:		
1. Ability to analyze various ad-hoc network technologies. 2. Learns about transport layer protocols and its mechanisms. 3. Acquaint with the knowledge on routing protocols. 4. Acquires knowledge on issues and challenges on Quality of Services. 5. Understands the architecture of wireless sensor networks.		
Text Book:		
1. Ad Hoc Wireless Networks: Architectures and Protocols -C. Siva Ram Murthy and B.S. Manoj- 2004-PHI. 2. Wireless Ad-hoc and Sensor Networks: Protocols- Performance and Control - Jagannathanarangapani-RC Press		
References:		
1.Ad-Hoc Mobile Wireless Networks: Protocols & Systems- C.K. Toh -1 ed. Pearson Education. 2.Wireless Sensor Networks -S. Raghavendra- Krishna M. Sivalingam- 2004- Springer.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A-SemesterV
MOOCS-II

MCA3.1.5: PYTHON PROGRAMMING

Credits: 4	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 70 Marks	Internal: 30 Marks

Course Objectives:

1. Teach an example of scripting and interpretative language and compare it with classical compiled programming languages.
2. Introduce the student to Python programming fundamentals.
3. Expose students to application development and prototyping using Python.
4. Learn to apply fundamental problem-solving techniques.

SYLLABUS

Unit I:

Introduction: History of Python, Need of Python Programming, Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

Types, Operators and Expressions: Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue, pass.

Unit II:

Data Structures: Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.

Functions -Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions (Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

Modules: Creating modules, import statement, from statement. Name-spacing, **Python packages** Introduction to PIP, Installing Packages via PIP, Using Python Packages.

Unit III:

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding.

Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions.

Unit IV:

Data base interaction: what is DB interaction, types of database's supported by python, Methods, how to insert the data in to database.

Multithreading in Python: Thread Control Block (TCB): Thread Identifier, Stack pointer, Program counter, Thread state, Thread's register set, Parent process Pointer–Multithreading.

Unit V:

Python file operations: file basic operations –open, write, appending, read, readline, readlines. **Python Standard Library** - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, GUI Programming.

Outcomes:

1. Familiarizes with the basics of Python language.
2. Gains knowledge on Python data structures, functions, modules and packages.
3. Understands object-oriented programming and exception handling.
4. Learns multithreading implementation and database connectivity in python.
5. Develops knowledge on Python file operations.

Text Book:		
1. Python Programming: A Modern Approach, VamsiKurama, Pearson 2. Learning Python, Mark Lutz, Orielly		
References:		
1. Think Python, Allen Downey, Green Tea Press 2. Core Python Programming, W. Chun, Pearson. 3. Introduction to Python, Kenneth A. Lambert, Cengage 4. NPTEL Videos.		

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)
M.C.A Semester V

MCA3.1.6: DATA MINING AND WAREHOUSING LAB

Credits: 3	Theory: -	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:

1.To apply the various data mining techniques available in WEKA for generating Knowledge such as Association Analysis, Classification and Clustering to various standard datasets and own datasets.
2.The main objective of this lab is to impart the knowledge on how to implement classical models and algorithms in data warehousing and data mining and to characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.
3. At the end to compare and contrast different conceptions of data mining.
4. To demonstrate the knowledge retrieved through solving problems.

SYLLABUS

Cycle-I:
Introduction to Weka Tool- Attribute Related File Format- Creation of ARFF Data sets for Student- ARFF Dataset for Employee-converting Pre-defined Data sets in ARFF format- Executing ARFF Data sets in Explorer.

Cycle-II:
Converting CSV format into ARFF using manual method- Converting CSV format into ARFF using Knowledge Flow for various data sets.

Cycle-III:
Generating Association Rules based on pre-defined datasets and user-defined data sets.

Cycle-IV:
Decision Tree Induction on Trained Data sets.

Cycle-V:
Exploring various pre-defined and user-defined data sets using Experimenter

Cycle-VI:
Design a Knowledge-Flow layout to load attribute selection and normalize the attributes and to store the results in CSV Saver.

Cycle-VII:
The Process of applying clustering techniques on various pre-defined and user-defined data sets and viewing the results using visualization.

Cycle-VIII:
Generating ROC Curves for pre-defined datasets and user-defined datasets

Outcomes:

1. Practices creating dataset in ARFF format.
2. Learns to convert excel data sheets to ARFF.
3. Applies knowledge on mining frequent patterns using apriori algorithm.
4. Ability to design real time classification applications.
5. Implements real time clustering techniques using WEKA tool.

References:

Data Mining Practical Machine Learning Tools and Techniques-3rd Edition- Ian H.Witten .Eibe Frank. Mark A. Hall

Gayatri Vidya Parishad College for Degree and P.G Courses (AUTONOMOUS)

M.C.A Semester V

MCA3.1.7: DOT NET TECHNOLOGIES LAB

Credits: 3	Theory: 4 Hours	Tutorials: -
Max Marks: 100	External: 50 Marks	Internal: 50 Marks

Course Objectives:

1. To introduce .Net IDE Component Framework.
2. Practice Programming in .Net Framework and design windows applications using inbuilt controls of .NET such as Calendar, Adrotator.
3. Creating website using ASP.Net Controls.
4. Using ADO.NET objects for database connectivity.

SYLLABUS

Week 1

1.Write a Program to generate the factorial operation.

2.Write a Program to perform Money Conversion.

Week 2

3. Write a Program to generate the Quadratic Equation.

4. Write a Program to generate the Temperature Conversion.

Week 3

5. Write a Program to generate the Login control.

Week 4

6. Write a Program to perform ASP.Net state.

Week 5

7. Write a Program to create an Advertisement using Ad rotator.

Week 6

8. Write a Program to display the Holiday in calendar.

9. Write a Program to display the vacation in calendar.

Week 7

10. Write a Program to display the selected date in the calendar.

11. Write a Program to display the Difference between the two dates in the calendar.

Week 8

12. Write a Program to perform Tree view operation using data list.

Week 9

13. Write a Program to perform validation operation.

Week 10

14. Write a Program to bind data in a multiline textbox by querying in another textbox.

Week 11

15. Write a Program to display the phone no of an author using database.

Week 12

16.Write a Program to insert the data in to database using Execute-Non-Query.

17.Write a Program to delete the data in to database using Execute non-query.

Week 13

18. Write a Program to bind data using data grid.

Outcomes:

1. Ability to develop simple interactive applications in .NET Framework environment.
2. Designs windows form applications using VB.NET controls.
3. Creates user interactive web pages using ASP.Net controls.
4. Practices programming using .NET built-in controls.
5. Implements applications using ADO.Net connectivity.

MASTER OF COMPUTER APPLICATIONS

Syllabi

With effect from 2016-17 admitted batch

III YEAR II SEMESTER

VI Semester

Semester code	Title of the Paper	Periods / Week		Max Marks		Total	Credits
		Theory	Lab	Ext.	Int.		
MCA3.2.1	Project	--	--	50	50	100	14
Total		--	--	**50**	**50**	**100**	**14**

GUIDELINES FOR PREPARING THE REPORT OF THE PROJECT WORK

FORMAT FOR PREPARATION OF PROJECT REPORT FOR M.C.A

1. LIST OF CONTENTS:

a. Abstract
b. Introduction
c. Literature survey
    a. Introduction
    b. Current system
    c. Problem statement
    d. Proposed system
    e. Objectives
    f. Functional and Non-Functional Requirements

4 UML Modeling
5 Design and description of algorithms (Examples included)
6 Coding
7 Testing
8 Results and Conclusions
9 References
    a. Research references
    b. Book references
10 Appendix
    a. List of tables
    b. List of figures
    c. Glossary

2. PAGE DIMENSIONS AND BINDING SPECIFICATIONS:

The dimension of the project report should be on A4 size with margin specifications 1.5inch space for all sides like top, bottom and left, Right. The project report should be bound using flexible cover of the thick white art paper. The cover should be **printed in black letters** and the text for printing should be identical.

3. PREPARATION FORMAT:

3.1 Cover Page & Title Page – A specimen copy of the Cover page & Title page of the project report are given in **Appendix 1.**

3.2 Bonafide Certificate: The Bonafide Certificate shall be in double line spacing using Font Style Times New Roman and Font Size 12, as per the format in **Appendix 2.**

The **certificate** shall carry the supervisor's signature and shall be followed by the supervisor's Name, academic designation (not any other responsibilities of administrative nature), Department and full address of the institution where the supervisor has guided the student. The term **'SUPERVISOR'** must be typed in capital letters between the supervisor's names And academic designation.

3.3 Abstract – Abstract should be one page synopsis of the project report typed double line

Spacing, Font Style ‘Times New Roman’ and Font Size ‘12’.

3.4 Table of Contents – The table of contents should list all material following it as well as any

Material which precedes it. The title page and Bonafide Certificate will not find a place Among the items listed in the Table of Contents but the page numbers of which are in lower Case Roman letters. 1.5” spacing should be adopted for typing the matter under this Head.

3.5 List of Tables – The list should use exactly the same captions as they appear above the Tables in the text. One and a half spacing should be adopted for typing the matter under this head.

3.6 List of Figures – The list should use exactly the same captions as they appear below the Figures in the text. One and a half spacing should be adopted for typing the matter under this head.

3.7 List of Symbols, Abbreviations and Nomenclature – One and a half spacing should be Adopted or typing the matter under this head. Standard symbols, abbreviations etc. should be Used.

3.8 Chapters – The chapters may be broadly divided into 3 parts (i) Introductory chapter, (ii) Chapters developing the main theme of the project work (iii) and Conclusion.

The main text will be divided into several chapters and each chapter may be further divided Into several divisions and sub-divisions.

- Each chapter should be given an appropriate title, Font Style Times New Roman and Font Size 14 with bold .
- Tables and figures in a chapter should be placed in the immediate vicinity of the Reference where they are cited.
- Footnotes should be used sparingly. They should be typed single space and placed Directly underneath in the very same page, which refers to the material they annotate.

3.9 Appendices:

- Appendices are supplemental to a thesis in nature and, when included, appear after the references/bibliography.
- Appendices should be numbered using Arabic numerals, e.g. Appendix 1, Appendix 2, etc.
- Appendices, Tables and References appearing in appendices should be numbered and

  referred to at appropriate places just as in the case of chapters.
- Appendices shall carry the title of the work reported and the same title shall be made in The contents page also.

3.10 List of References:

The listing of references should be typed 4 spaces below the heading "REFERENCES" in alphabetical order in single spacing left – justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details. A typical illustrative list given below relates to the citation example quoted above.

REFERENCES

1. Ariponnammal, S. and Natarajan, S. (1994) 'Transport Phonomena of SmSel – X Asx', Pramana – Journal of Physics Vol.42, No.1, pp.421-425.
2. Barnard, R.W. and Kellogg, C. (1980) 'Applications of Convolution Operators to Problems in Univalent Function Theory', Michigan Mach, J., Vol.27, pp.81–94.
3. Shin, K.G. and Mckay, N.D. (1984) 'Open Loop Minimum Time Control of Mechanical Manipulations and its Applications', Proc.Amer.Contr.Conf., San Diego, CA, pp. 1231-1236.

3.10.1 Tables and Figures:

All numerical data in the body of the project report should be designed in a tabular form. All other non-verbal materials used in the body of the project work and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures.

4. TYPING INSTRUCTIONS:

1. The impression on the typed copies should be black in color.
2. 1.5" spacing should be used for typing the general text.
3. The general text shall be typed in the Font style 'Times New Roman' with Font size is 12.
4. All side headings shall be typed in the Font style 'Times New Roman' and Font Size is 12
with Bold.

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GAYATRI VIDYA PARISHAD

COLLEGE FOR DEGREE and P.G COURSES (Autonomous)

(Affiliated to Andhra University)

YENDADA, VISAKHAPATNAM

Department of Computer Sciences

Certificate

This is to certify that the project report entitled **"----------"** is the bona fide record of project work carried out by **Mr/Mrs/Miss. XXXXXXX (Regd. No. ----------),** a student of this college, during the academic year **2014-2015**, in partial fulfillment of the requirements for the award of the degree of Master of Computer Applications.

Project Guide
Name
Designation

Head of the Department
Name
Designation

External Examiner

DECLARATION

I, **Mr/Mrs/Miss. XXXXXXX** hereby declare that the project report entitled "----------" is an original work done at **Gayatri Vidya Parishad College for Degree And P.G Courses(A), Visakhapatnam,** submitted in partial fulfillment of the requirements for the award of Master of Computer Applications, to GayatriVidyaParishad College for Degree And P.G Courses(A), affiliated to Andhra University. I assure that this project is not submitted by me in any other University or college.

(Mr/Mrs/Miss. XXXXXXX)

ACKNOWLEDGEMENT

I consider it as a privilege to thank all those people who helped me a lot for successful completion of the project "----------".

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(Mr/Mrs/Miss. XXXXXXX)

CERTIFICATE FOR STUDENTS WHO HAD DONE PROJECT IN THE INDUSTRY /ORGANISATION

CERTIFICATE FROM INDUSTRY

This is to certify that it is a bonafide record of the Dissertation work entitled "_____" done by <STUDENT NAME> , a student of MCA in the Department of Computer Sciences, Gayatri Vidya Parishad College for Degree and PG Courses during the period 200 - 200 in partial fulfillment of the requirements for the Award of Degree of MASTER OF COMPUTER APPLICATIONS. This work is not submitted to any University for the award of any Degree / Diploma. This work is carried out in GayatriVidyaParishad Degree and P.G College(Autonomous), Rushikonda, Yendada Village, Visakhapatnam-530045.

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