Bagalkot University,

(A State Public University of Govt. of Karanataka)

Jamkhandi

The Draft

COURSE STRUCTURE AND SYLLABUS

As per the Choice Based Credit System (CBCS)For

MASTER OF COMPUTER APPLICATION

Adapted from RCU Belagavi applicable fromthe

Academic Year 2023-24

Preamble for PG Syllabus of Bagalkot University

Bagalkot University Jamkhandi has been established by the Government of Karnataka and has started functioning from the academic year 2023-24. All the degree colleges other than engineering and medical colleges in the district of Bagalkote, are affiliated to this university as per the Karnataka State Universities Act 2000, as modified by the 26th Aug of 2022. The students taking admission to any of the colleges in the district of Bagalkote, from the academic year 2023-24 will be students of Bagalkot University. The Chancellor of the university, the honorable Governor of Karnataka, has instructed the Vice chancellor and the university to adapt, the rules and regulations of the parent university, Rani Channamma University, Belagavi for the immediate activities (Vide letter from the office of the Governor GS 01 BGU 2023 dated 17/05/2023).

In this connection, Bagalkot University has adapted the postgraduate syllabus from RCU, Belagavi for all the 2 years degree PG programmes such as M.A.(English), M.A.(Political Science), M.S.W.,M.Com, etc. The syllabus follows the Choice Based Credit System introduced by University and provides flexibility to the students to choose their course from a list of electives and soft-skill courses, which makes teaching-learning student-centric. The higher semester syllabi will be published in due course. The syllabus is being published as one electronic file for each degree and is self-contained. Only the subject codes/ question paper codes are changed, whereas the subject syllabus remains the same. The subject code format is described in the following.

Subject Code Format for   M.A. (History) and M.Sc. (Physics)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ver.	Uni. Code		DEGREE			SEM		DISCIPLINE			SUB. TYPE			SL. NO. IN DISC. & S. TYPE		TH/ LAB /B/I NT.
1	2	6	M	S	C	0	1	P	H	Y	C	S	C	0	1	T
1	2	6	M	A	M	0	1	H	I	S	C	S	C	0	1	T

[1]The Ver. information gives the version of the syllabus. It can take values 1, 2..9,a,b,…

[2-3]The University UUCMS Code

[4-6] The PG degree codes to be provided as

Sl. No	Degree Code	Degree
1	MSC	Master of Science
2	MAM	Master of Arts
3	MCM	Master of Commerce
4	MBA	Master of Business Administration
5	MCA	Master of Computer Applications
6	MSW	Master of Social Work
7	MED	Master of Education
8	MPE	Master of Physical Education

[7-8]The Semester Information is provided as

Sl. No	Semester
1	„01
2	‟02
3	03
….	

[9-11]The Discipline Information to be provided as

Sl No	Degree	Discipline Code
1	MCM-MCOM	XXX
2	MCA	XXX
3	MBA	XXX
4	MSW	XXX
5	MAM	„HIS",POL",„KAN", „ENG"
6	MSC	„PHY",„CHE", „MAT",
7	MED-MEd	XXX
8	MPE-MPEd	XXX

[12-14]The Subject Type to be provided as

Sl. No.	TYPE	Description
1	HCC	Hard Core Course
2	CSC	Core Subject Course
3	SCC/SPC/OPC	Soft Core Course /Specialization Course/ Optional Course
4	BRC	Bridge Course (Only For MCA)
5	OEC	Open Elective Course

[15-16] The Running Serial Number is to be provided for a particular subject type 01 to 99

[17] This character specifies the category of the subject namely, T=theory, L-Lab, P-Project, I-Internship, B- Bothe theory and Lab

Semester-I	Course	Subject Name	Teaching Hrs per week	Practical Hrs/week	Examination				Credits
					Duration(Hrs.)	Marks			
						Theory/ Practical	IA	Total	
Core Subject	126MCA01XXXCSC01T	Discrete Mathematical Structures	4	--	3	80	20	100	4
	126MCA01XXXCSC02T	Object Oriented Programming with C++	4	--	3	80	20	100	4
	126MCA01XXXCSC03T	Unix System Programming	4	--	3	80	20	100	4
	126MCA01XXXCSC04T	Data Structures and Algorithms	4	--	3	80	20	100	4
	126MCA01XXXCSC01L	Unix System Programming Lab	--	4	3	80	20	100	3
	126MCA01XXXCSC02L	Data structure and Algorithm using C++Lab	--	4	3	80	20	100	3
Soft Core /Specialization/ Optional	126MCA01XXXSCC01T	Computer System Architecture	4	--	3	80	20	100	4
Bridge Course	126MCA01XXXBRC01T	C Programming	4	-	3	80	20	100	-
		Total	**24**	**8**				**800**	**26**

Note: **CSC : Core Subject   SCC: Soft Core   L: Practical Lab**

Bridge Course (126MCA01XXXBRC01T) is an on credit paper to be offered only for non-Computer Science background students (B. Sc, BA and B.COM). However such students have to obtain eligibility both in Semester end examination and I.A as per the University Norms.

I-Semester Syllabus

Discrete Mathematical Structures
Course Code: 126MCA01XXXCSC01T

Teaching:4hrs./week	**Max.Marks:80**
Credits:04Hrs.:52	**I.A.Marks:20**

UNIT-I 10 Hrs

Sets and Logic: Sets, propositions, conditional propositions and logical equivalence, arguments and rules of inference, quantifiers, nested quantifiers.

UNIT-II 12Hrs

Proofs: Principles of mathematical induction, Functions, Relations: relations, operations on relations, Properties of relations, equivalence relations, matrices of relations, Partially ordered sets, lattices, finite Boolean algebra, functions on Boolean algebra.

UNIT-III 10Hrs

Graph Theory: Introduction of Graphs and digraphs, Paths and Cycles, Hamiltonian Cycles, adjacency and incidence matrices, vertex coloring, representation so graphs, isomorphism of graphs, planar graphs.

UNIT-IV 10 Hrs

Trees: Terminology and characterizations of trees, spanning trees, minimal spanning trees, shortest-path algorithm, binary trees, tree traversals, decision trees, isomorphism of trees.

UNIT-V 10Hrs

Semi Groups and Groups: Semi groups, products and quotients of semi groups, groups, products and quotients of groups. Groups and coding: Coding of Binary information and error detection, decoding and error detection.

Text Books:
1. KennethH. Rosen, Discrete Mathematic sandits Applications, 5/e, Tata McGraw Hill.
2. Deo N., Graph theory with application to Engineering and Computer Science, Prentice Hall of India,
3. Kolman, Busby, Ross, Discrete Mathematical Structures, Pearson Education.

Reference Books:
1. J. P. Tremblayand R. Manohar, Discrete Mathematical structures with applications to Computer Science, Tata Mc Graw Hill.

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Object Oriented Programming with C++
Course Code: 126MCA01XXXCSC02T

Teaching: 4hrs. / Week	**Max. Marks:80**
Credits:04Hrs.: 52	**I.A. Marks: 20**

UNIT-I   10Hrs

Overview of C++: Object Oriented Programming concepts, advantages, C++ program development environment, the C++ language standards, C++as a super set of C. Classes & Objects: classes, structure & classes, union & classes, inline function, scope resolution operator, static class members: static data member, static member function, passing objects to function, returning objects, object assignment, constructors & destructors, friend function, friend classes.

UNIT-II   10Hrs

References & Dynamic Allocation Operators: array of objects, pointers to object, type checking C++pointers, the this pointer, pointer to derived types, pointer to class members, reference parameter, call by reference and return by reference, passing references to objects, returning reference, C++„s dynamic allocation operators, allocating objects,

UNIT III   12Hrs

Overloading as polymorphism: function & operator overloading, operator overloading restrictions, operator over loading using friend function.

Name spaces: global name space and name space std, nested name spaces

Inheritance: base class access control, inheritance & protected members, protected base Class in heritance, inheriting multiple base classes, constructors, destructors & inheritance, execution of constructor & destructor functions, passing parameters to base class constructors, granting access, virtual base classes . Virtual Functions & Polymorphism: virtual function, pure virtual functions, early vs. late binding.

UNIT-IV   10Hrs

Templates and Exception Handling: Exception handling in C++, try, throw, catch sequence, multiple catch blocks, uncaught exceptions, catch-all exception handler, Templates: Reason for templates, compactness and flexibility, function template, class templates. The C++ I/O System Basics: C++ Streams, the basic stream classes, C++ predefined streams, for matted I/O, file processing.

UNIT-V   10Hrs

Overview of the Standard Template Library: The Standard Template Library, Design goals, Header files, STL components, STL Example: vectors, lists, maps, sets. Containers-Vector, Deque, List, Associative Containers, Set, Multistep, Map, Multi map. It erators: Input iterators, Output it erators, For ward it erators, Backward iterators.

References:

1. Herbert Schildt, C++ The Complete Reference, Tata McGraw Hill Publication.
2. A l Stevens, C++ Programming, Wiely Publications.
3. B.A. Forouzon, R.F.Gilberge, Computer Science: A Structured Approach Using C++, Thomson Learning.
4. Stroubstrup B., The C++ Programming Language, Addis on Wesley.
5. William H.Murray, Chris H.Pappas, Data structures with STL Prentice Hall.

Unix System Programming	
Course Code: 126MCA01XXXCSC03T	
Teaching: 4hrs./ week **Credits:04Hrs.:52**	**Max. Marks:80** **I.A.Marks:20**

UNIT-I 10Hrs
UNIX and ANSI Standards: The ANSI C Standard, The POSIX Standards, The POSIX.1 Standards. UNIX and POSIX APIs: The POSIX APIs, the UNIX and POSIX Development Environment, API Common Characteristics.

UNIT-II 12Hrs
Files: File Types, The UNIX and POSIX File System, The UNIX and POSIX File Attributes, Inodesin UNIX System V, Application Program Interface to Files, UNIX Kernel Support for Files, Relationship of C Stream Pointers and File Descriptors, Directory Files, Hard and Symbolic 0 Links.
File APIs: General File APIs (create, open, write, read, close, font),File and Record Locking, Directory File APIs, Device File APIs, FIFO File APIs, Symbolic Link File APIs, File Listing Program using APIs.

UNIT-III 10Hrs
Processes: Introduction, Process Identifiers, fork, vfork, exit, wait, waitpid, waited, wait3, wait4 Functions, Race Conditions, exec Functions, Changing User IDs and Group IDs, Interpreter Files, System Function, Process Accounting, User Identification, Process Time Process Relationships: Introduction, Terminal Logins, Network Logins, Process Groups, Sessions, Controlling Terminal, tc get pgrp, tI SEtpgrp, and tc get sid Functions, Job Control, Shell Execution of Programs, Orphaned Process Groups.

UNIT-IV 10Hrs
Signals: The UNIX Kernel Support for Signals, signal, Signal Mask, sig action, The SIGCHLD Signal and the wait pid Function, The sig set jmp and sig long jmp Functions, Kill, Alarm

UNIT-V 10Hrs
Inter process Communication: Introduction to IPC, Pipes, popen, pclose Functions, Co processes, FIFOs. Advanced IPCs: Message Queues, Semaphores, Shared Memory

Reference Books:

1. W.Richard Stevens, Stephen A.Rago, Advanced programming in the UNIX Environment, 2/e, Addison Wesley Professional.
2. Terrence Chan, Unix System Programming Using C++, Prentice Hall India
3. Marc J. Rochkind, Advanced Unix Programming, 2/e, Pearson Education. Maurice.J.Bach, The Design of the UNIX Operating

Data Structure and Algorithm
Course Code: 126MCA01XXXCSC04T

Teaching: 4hrs./week	Max. Marks:80
Credits:04Hrs.:52	I.A.Marks:20

UNIT-I 10Hrs

The Stack: Definition and examples, Primitive operations, Example, The stack as an ADT, Representing stacks in C, Implementing the pop operation, Testing for exceptional conditions, Implementing the push operation, Examples for infix, postfix, and prefix expressions, Basic definition and examples, Program to evaluate a postfix expression, Converting an expression from infix to postfix, Program to convert an expression from infix to postfix. Recursion and Queues: Recursive definition and processes, Factorial function, Multiplication of natural numbers, Fibonacci sequence, Binary search, Properties of recursive definition or algorithm. Recursion in C, Factorial in C, Fibonacci numbers in C, Binary search in C, Tower so f Hanoi problem. The queue and it sequential representation, the queue as ADT, Complementation of queues, Insert operation, Priority queue, and Array implementation of a priority queue.

UNIT-II 10Hrs

Lists: Linked lists, Inserting and removing nodes from a list, Linked implementation of stacks, get node and free node operations, Linked implementation of queues, Linked list as a data structure, Example of list operations, Header nodes, Lists in C, Array implementation of lists, Limitation so farray implementation, allocating and freeing dynamic variables, Linked lists using dynamic variables, Queues as lists in C, Examples of list operations in C, Non integer and non- homogeneous lists, Other list structures: Circular lists, Stack as a circular list, Queue as a circular list, Primitive operations on circular lists, doubly linked lists. Trees: Binary trees, operations on binary trees, Applications of binary trees, Binary tree representation, Node representation of binary tree, Internal and external nodes, Implicit array representation of binary trees, Choosing a binary tree representation, Binary tree traversal in C, Threaded binary trees.

UNIT-III 12Hrs

Graphs and Their Applications: Graphs: Definitions, Application of graphs, C representation of graphs, Traversal methods for graphs, Depth first traversal, Breadth first traversal. Algorithms: Notion of algorithm, Fundamentals of algorithmic problem solving, problem types, linear data structures, graphs, trees, sets and dictionaries. Analysis of algorithm efficiency: Analysis frame-work, asymptotic notations and basic efficiency classes, mathematical analysis of non-recursive and recursive algorithms, empirical analysis of algorithms

UNIT-IV 10Hrs

Brute Force and Divide and Conquer: selection sort and bubble sort, sequential search and brute-force string matching, closest-pair and convex -hull problems, exhaustive search, merge sort, quick sort, binary search, binary tree traversals, Stassen"s matrix multiplication. Decrease-and-Conquer and Transform-and-Conquer: Insertion sort, depth first search, topological sorting, presorting, Gaussian elimination, balanced search trees, heap sort, Horner's rule.

UNIT-V 10Hrs

Dynamic programming: Computing a Binomial coefficient, Warshall's and Floyd' algorithms, the Knap sack problem and memory functions. Greedy technique-Prim's algorithm, Dijkstra'a algorithm, Huffman trees. Decision trees, P, NP, and NP-complete problems, challenge so f numerical algorithms.

Reference Books:

1. A. M. Tenenbaum, Y,Langsam, M.J.Auguste in, R.L. Kruse, B.P. Leungand C.L.Tondo, Data Structures using C, PHI.
2. Anany Levi tin, The Design and Analysis of Algorithms, Pearson Education. References:
3. MarkAllen Weiss, Data Structures and Algorithm Analysis in C, Pearson Education
4. Richard F. Gilberg, Behrouz A. Forouzan, Data structures-A Pseudo code Approach with C, Thomson Learning.
5. AhoA. V,Hop croft J.E and Ullman, J.D., The Design and Analysis of Computer Algorithms, Addison, Wesley
6. Ellis, Horwitz, Sartaj SahaniandS. Rajashekaran, Computer Algorithms, Galgotia Publications Pvt. Ltd.

Computer System Architecture
Course Code: 126MCA01XXXSCC01T

Teaching:4hrs./week	**Max.Marks:80**
Credits:04Hrs.:52	**I.A.Marks:20**

UNIT-I   12 Hrs

Computer Data Representation- Basic computer data types, Complements, Fixed point representation, Register Transfer and Micro-operations: Floating point representation, Register Transfer language, Register Transfer, Bus and Memory Transfers (Tree-State Bus Buffers, Memory Transfer), Arithmetic Micro-Operations, Logic Micro Operations, Shift Micro-Operations, Arithmetic logical shift unit Basic Computer Organization and Design-Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions,

UNIT-II   10Hrs

Basic Computer Organization and Design Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input output and interrupt, Complete computer description, Design of Basic computer, design of Accumulator Unit

UNIT-III   10 Hr

Programming The Basic Computer Introduction, Machine Language, Assembly Language, assembler, Program loops, Programming Arithmetic and logic operations, subroutines, I-O Programming. Micro programmed Control: Control Memory, Address sequencing, Micro program Example, design of control Unit

UNIT-IV   10Hrs

Central Processing Unit Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control, Reduced Instruction Set Computer(RISC)

UNIT-V   10Hrs

Pipeline And Vector Processing Flynn's taxonomy, Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline, RISC Pipeline, Vector Processing, Array Processors.

Text Books:

1. M.Morris Mano, Computer System Architecture, Pearson publications.
2. Andrew S.Tanenbaum and Todd Austin, Structured Computer Organization, Sixth Edition, PHI

C Programming
Course Code: 126MCA01XXXBRC01T

Teaching:4hrs./week	**Max.Marks:80**
Credits:03.	**I.A.Marks:20**

UNIT-I 10Hrs

INTRODUCTION TO C LANGUAGE: Pseudo code solution to problem, Basic concepts in a C program, Declaration, Assignment & Print statements, Data Types, operators and expressions etc, Programming examples and exercise.

UNIT-II 10Hrs

BRANCHING AND LOOPING: Two way selection (if, if-else, nested if-else, cascaded if-else), switch statement, ternary operator? Go to, Loops (For, while-do, do-while) in C, break and continue, Programming examples and exercises.

UNIT-III 10Hrs

ARRAYS AND STRINGS: Using an array, Using arrays with Functions, Multi-Dimensional arrays. String: Declaring, Initializing, Printing and reading strings, string manipulation functions, String input and output functions, array of strings, Programming examples and Exercises.
FUNCTIONS: Functions in C, Argument Passing – call by value, call by reference, Functions and program structure, location of functions, void and parameter less Functions, Recursion, Programming examples and exercises.

UNIT-IV 10Hrs

STRUCTURES AND FILE MANAGEMENT: Basic of structures, structures and Functions, Array of structures, structure Data types, type definition, Defining, opening and closing of files, Input and output operations, Programming examples and exercises.

UNIT-V 10Hrs

POINTERS AND PREPROCESSORS: Pointers and address, pointers and functions (call by reference) arguments, pointers and arrays, address arithmetic, character pointer and functions, pointers to pointer, Initialization of pointer arrays, Dynamic memory allocations methods, Introduction to Preprocessors, compiler control Directives, Programming examples and exercises.

Text Books:
1. BrianW.Kernighan and Dennis M.Ritchie: The C Programming Language, 2nd Edition, PHI, 2012.
2. Jacqueline Jones & Keith Harrow: Problem Solving with C, 1st Edition, Pearson2011.

Syllabus MCA

Semester -II

Semester-II	II-SEMSTER MCA								
	Course	Subject Name	Teaching Hrs per week	Practical Hrs/ week	Examination				Credits
					Duration (Hrs.)	Marks			
						Theory / Practical	IA	Total	
Core Subject	126MCA02XXXCSC05T	Data base Management Systems	4	--	3	80	20	100	4
	126MCA02XXXCSC06T	Programming using Java	4	--	3	80	20	100	4
	126MCA02XXXCSC07T	Data Mining Techniques	4	--	3	80	20	100	4
	126MCA02XXXCSC03L	Data base Management Systems–Lab	-	4	3	80	20	100	3
	126MCA02XXXCSC04L	Programming using JAVA Lab		4	3	80	20	100	3
Soft Core /Specialization/ Optional	126MCA02XXXSCC02T	Data Communication and Computer Networks	4	--	3	80	20	100	4
Open Elective	126MCA02XXXOEC01T	a. Big Data Analytics	4	--	3	80	20	100	4
	126MCA02XXXOEC02T	b. Internet Concepts and Web Design							
	126MCA02XXXOEC03T	c. Management Information System							
		Total	**20**	**8**				**700**	**26**

CS: Core Subject   SC: Soft Core   PL: Practical   OE: Open Elective

II- Semester

Data base Management System
Course Code: 126MCA02XXXCSC05T

Teaching:4hrs./week	Max.Marks:80
Credits:04Hrs.:52	I.A.Marks:20

UNIT-I   12hrs
Introduction: Data modeling for a data base, abstraction and data integration, the three-level architecture, components of DBMS, advantages and disadvantages, data associations, data model classification, Entity-Relationship model.

UNIT-II   10hrs
File organization and storage, secondary storage devices, operations in file, heap files and sorted files, hashing techniques, type of single level ordered index, multi-level indexes indexes on multiple keys, other types of indexes.

UNIT-III   12hrs
The Relational Model: Relational data base, relational algebra, relational calculus SQL-Data definition, relational data base manipulation using SQL, views, embedded data manipulation.
Relational Database Design: Anomalies in a database, functional dependency, normal forms, loss less join and dependency, BCNF, normalization through synthesis, higher order normal forms.

UNIT-IV   10hrs
Transaction processing, desirable properties of transaction, schedules and recoverability, serializability of schedules con currency control, locking techniques, time stamp ordering multi version concurrency control, granularity of data items.

UNIT-V   8hrs
Database recovery techniques based on deferred up data and immediate updating, shadow pages, ARIES recovery algorithm, database security and authorization, security issue access control based on granting/revoking of privileges, introduction of statistical data base security.

Text Books:
1. Bipin C Desai, An Introduction to Database Systems, Galgotia Publications.
2. Elmasri and Navathe, Fundamentals of Database Systems, Addison Wesley

References:
1. Silberschatz A, Korth H.F and Sudarshan S, Database System Concepts, Tata Mc Graw Hill
2. S K Singh, Database Systems-Concepts, Design and Applications, Pearson Education.
3. Bipin C.Desai, An Introduction to Database Systems, Galgotia Publications.
4. Date, C. J., An Introduction to Database Systems, Addison-Wesley.

Programming using Java	
Course Code: 126MCA02XXXCSC06T	
Teaching:4hrs./week	Max.Marks:80
Credits:04Hrs.:52	I.A.Marks:20

UNIT-I   **10 Hrs**

Introduction to Java programming, The Java Virtual Machine, Variables and data types, Conditional and looping constructs, Arrays.

UNIT-II   **10 Hrs**

Object oriented programming with Java Classes and Objects, Fields and Methods, Constructors, Overloading methods, Garbage collection, Nested classes.

UNIT-III   **10 Hrs**

Inheritance, Overriding methods, Polymorphism, Making methods and classes final, Abstract classes and methods, Interfaces.

UNIT-IV   **12 Hrs**

Exception handling with try-throw-catch-finally constructs, The Exception class Packages, Package access, Documentation comments.
The Object class, Cloning objects, The JDK Linked List class, Strings, String conversions Working with types: Wrapper classes, Enumeration interface.

UNIT-V   **10 Hrs**

Applets, Configuring applets, Applet capabilities and restrictions, Basics of AWT and Swing, Layout Managers, Event Handling, The Action Listener interface, Panels, Classes for various controls, such as label, choice, list,, Check box, etc., Dialogs and frames, Using menus, Using the Adapter classes, Graphics.

References:
1. Herbet Schidtand Dale Srien, Java Fundamentals-Acomprehensive Introduction, TMH.
2. P.J. Deitel and H.M. Deitel, Java for Programmers, Pearson education
3. P.J. Deitel and H.M.Deitel, Java: How to Program, PHI.
4. S. Malhotra and S.Choudhary, Programming in Java, Oxford Univ. Press.

Data Mining Techniques		
Course Code: 126MCA02XXXCSC07T		
Teaching:4hrs./week		Max.Marks:80
Credits:04Hrs.:52		I.A.Marks:20

UNIT-I **10 Hrs**

Introduction: Well posed learning problems, designing a Learning system, Perspective and Issues in Machine Learning. Concept Learning: Concept learning task, Concept learning as search, Find-Salgorithm, Version space, Candidate Elimination algorithm, Inductive Bias.

UNIT-II **10 Hrs**

Decision Tree Learning: Decision tree representation, Appropriate problems for decision tree learning, Basic decision tree learning algorithm, hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning.

UNIT-III **10Hrs**

Artificial Neural Networks: Introduction, Neural Network representation, appropriate problems, Perceptions, Back propagation algorithm.

UNIT-IV **10 Hrs**

Bayesian Learning: Introduction, Bayes theorem, Bayes theorem and concept learning, ML and L Serror hypothesis, ML for predicting probabilities, MDL principle, Naive Bayes classifier, Bayesian belief networks, E Malgorithm.

UNIT-V **12 Hrs**

Evaluating Hypothesis: Motivation, Estimating hypothesis accuracy, Basics of sampling theorem, General approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms. Instance Based Learning: Introduction, k-nearest neighbor learning, locally weighted regression, radial basis function, cased-based reasoning, Reinforcement Learning: Introduction, Learning Task, Q Learning.

Text Books:
1.Tom M.Mitchell, Machine Learning, India Edition 2013, Mc Graw Hill Education.

Reference Books:
1. Trevor Hastie, Robert Tibshirani, Jerome Friedman, h The Elements of Statistical Learning, 2nd edition, springer series in statistics.
2. Ethem Alpaydın, Introduction to machine learning, second edition, MI Tpress.

Data Communication and Computer Networks
Course Code: 126MCA02XXXSCC02T

Teaching:4hrs./week   Max.Marks:80
Credits:04Hrs.:52   I.A.Marks:20

UNIT-I   **12Hrs**
Introduction: Data Communications, Networks, the internet, protocols and standards, network models–
OSI model, TCP/IP protocol suite, addressing. Data and Signals: Periodic analog signals, digital signals,
transmission impairment, data rate limits, performance

UNIT-II   **10 Hrs**
Physical Layer and Media: Analog transmission: Digital-to-analog conversion, analog-to-analog
conversion. Multiplexing, Trans mission media–Guided media and unguided media. Data Link Control:
Framing, flow and error control,

UNIT-III   **10 Hrs**
Network Layer: Logical addressing– IPV4, IPV6, Address mapping–ARP,RARP,
Transport Layer: Process to Process Delivery, User Datagram Protocol, Transmission Control
Protocol, SCTP, Congestion Control.

UNIT-IV   **10 Hrs**
Detection and Correction: Errors, redundancy, detection versus correction, Network Security-
Security Services, Security in the Internet: Firewalls

UNIT-V   **10 Hrs**
Application Layer: Domain Name Space, DDNS, Remote Logging, Electronic Mail, and File
Transfer, WWW,HTTP

Text Books:

Behrouza A Forouzan, Data Communications and Networking, McGraw Hill. Computer
Networks- Andrews. Tanenbaum, Pearson Education.

References:
Data and Computer Communications, William Stallings, Pearson education
Data Communications, Computer Networks and Open Systems, fourth edition-Fred
Halsall, adison Wesley.

a) Big Data Analytics
Course Code: 126MCA02XXXOEC01T

Teaching:4hrs./week	Max.Marks:80
Credits:04Hrs.:52	I.A.Marks:20

UNIT-I 10Hrs

INTRODUCTION TO BIG DATA AND HADOOP Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Info sphere Big Insights and Big Sheets

UNIT-II 10Hrs

HDFS (Hadoop Distributed File System) The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

UNIT-III 12Hrs

Map Reduce Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features.

UNIT-IV 10Hrs

Hadoop Eco System Pig: Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.
Hive: Hive Shell, Hive Services, Hive Meta store, Comparison with Traditional Databases, Hive QL, Tables, Querying Data and User Defined Functions.
H base: H Basics, Concepts, Clients, Example, H base Versus RDBMS. Big SQL: Introduction

UNIT-V 10Hrs

Data Analytics with R Machine Learning: Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering. Big Data Analytics with Big R.

Text Book:
1. Tom White "Hadoop: The Definitive Guide" Third Editon, O "reily Media,2012.
2. Seema Acharya, Subhasini Chellappan,"Big Data Analytics" Wiley 2015.

b) Internet Concepts and Web Design
Course Code: 126MCA02XXXOEC02T

Teaching:4hrs./week	Max.Marks:80
Credits:04Hrs.:52	I.A.Marks:20

UNIT-I: **10hrs**

History of the internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains. Introduction World Wide Web (WWW), working of web browser and web server, Web server and its deployment, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), format of the URL, Hyper Text Transfer Protocol(HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure(HTTPS).

UNIT-II: **12hrs**

Principles and planning of Web Design: Design for the medium: craft the look and feel, portable design, design for low band width, plan for clear presentation and easy access, Design the whole site: smooth transition, grids for visual structure, active white space, Design for the user: design for interaction, location, flat hierarchy, power of hypertext linking, content decision, Design for the screen, Planning the site, site specification, identity and content goal, analyzing audience, building web site development team, filename and URLs, Directory structure, diagram the site.

UNIT-III: **10hrs**

Introduction to HTML: Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, meta tags, ordered and unordered lists, Table Handling: Table layout & presentation, constructing tables in a web page, Frames: Developing Web pages using frames. Forms and its elements, special tags like COL GROUP, THEAD, TBODY, TFOOT, IFRAME, LABEL etc.

UNIT-IV: **10hrs**

Introduction to JAVASCRIPT: JavaScript variables and data types, statement and operators, control structure object-oriented programming: Functions, Executing deferred scripts, objects, Messaging in a JavaScript: dialog boxes, Alert boxes, confirm boxes, prompt boxes, JavaScript with HTML, Events, Events Handlers, Forms, Forms array.

UNIT-V: **10hrs**

Site Navigation and Publishing of Website: Crating usable navigation, Using text based navigation: Linking with text based navigation bar, linking to individual files, linking to document/external document fragments, contextual linking, Using graphics based navigation: using text image for navigation, using icon for navigation. Website Publishing: choosing an internet service provider, buying a domain name, using FTP to upload files, Website testing: testing consideration, usertesting, feed back form. Refining and updating contents, working with searching inessubmitting URL stosearchingines.

Text Books:-

1. Joel Sklar: Principle sof Web Design, Thiomson Learning, Vikas Publisher.

2. Web Technologies-A computer science perspective By Jeffrey C. Jackson, Pearson Eduction .

3. Thomas A. Powell: HTML complete Refrence, TMH

4. The Complete Reference Web Design, Thomas A. Powell

5. Internetand Web Design, Vikas Gupta, Dream Tech.

7.D Comer,The Internet Book, Second Edition, 2001, Prentice Hall of India.

(c):Management Information System
Course Code: 126MCA02XXXOEC03T

Teaching:4hrs./week	Max.Marks:80
Credits:04Hrs.:52	I.A.Marks:20

UNIT-I 10Hrs

Management Information System (MIS)- concept, Definition and role of MIS, E-business enterprise, strategic management of business, information security challenges in e-enterprises, impact of information technology on society.

UNIT-II 10Hrs

Decision making- concepts and process, MIS and decision making. Information-concepts, classification value and methods of data and information collection, MIS and the information and knowledge.

UNIT-III 10Hrs

Systems concept- types of systems, classes of systems, general model of MIS, systems analysis, systems development model-SSAD, MIS and systems analysis, Object oriented analysis, Object oriented, OOSAD development lifecycle.

UNIT-IV 10Hrs

Development of MIS, Decision Support systems and knowledge management, knowledge based expert systems, MIS and benefits of DSS, Enterprise resource planning systems-models and benefits.

UNIT-V 12Hrs

Information Technology- data, transaction, and application processing; database concepts, RDBMS, client-server architecture, Data Warehouse-concept and architecture, business intelligence, data ware house and MIS, models of e-business, electronic payment systems, security, MIS in web environment. Case studies.

References:

1. W. S. Jawadekar, Management Information Systems, 4th edition, Mc Graw Hill.

2. James O" Obrien and George M.Marakas, Management Information Systems, 10th edition, Mc Graw Hill edition.

3. Jaiswal and Mittal, Management Information Systems, Oxford University Press.

4. Turbanand Aronson, Decision Support systems and intelligent systems, Pearson Education.