B.L.D.E.ASSOCIATION'S
SB ARTS AND K.C.P. SCIENCE COLLEGE, VIJAYAPUR
REACCREDITED AT THE 'A' LEVEL
Department Of M.Sc(CS)

PROGRAM OUTCOMES

Program Outcomes	Description
PO1: Engineering Practices	Apply software engineering practices and strategies in real time software project development
PO2: Enhancement in Trends	Enhancement in contemporary trends in industrial / Research setting and thereby innovate novel solutions to existing problems.
PO3: Develop computer applications	Design and develop computer applications in the different domains.

PROGRAMME SPECIFIC OUTCOMES

Program Specific Outcome	Description
PSO1:Acquiring fundamental knowledge	Capability to learn basic concepts and methods of various subjects
PSO2:Building skills on Problem solving techniques and methods	Learning programming languages through pseudocode, algorithm and flowchart, decision making techniques and building logical skills
PSO3:Demonstration of experimental methods	Acquiring the knowledge by implementing the algorithms using technologies.
PSO4:Enhancement of skills	Ability to design, develop and integrate the system and application programs through IDE and tools.
PSO5:Project work	Applying the computer science skills like analysis, design, development testing and deployment to produce to computing based solutions
PSO6:Presentation and communication skills	Ability to engage independent and lifelong learning in the broadest context.

Course Outcomes (CO's)

Semester - I

Paper :16MScCS11 **Subject: Discrete Mathematics**

Course Outcome	Description
CO1: Understanding Sets and logics	Understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving.
CO2: Learning Proofs and functions	Ability to reason logically and to learn about Mathematical Induction, Functions, Diagraph and lattice.
CO3: Attaining the number theory and counting methods	Ability to understand number representations, pigeonhole principle and recurrence relations,
CO4: Representation of graph and trees	Ability to understand use of graphs and trees, its significance in programming applications.
CO5: Cogitate the groups and coding	Understand use of groups and codes in Encoding-Decoding and Error detection.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	-	1	-	3	3	3	2	-	-
CO2:	-	-	2	3	3	3	3	1	-
CO3:	2	2	3	2	3	2	1	1	2
CO4:	2	2	-	3	3	3	2	2	-
CO5:	1	2	3	2	3	2	2	2	1

Paper:16MScCS12 Subject: Digital Logic and Computer Design

Course Outcome	Description
CO1: Envisioning the digital systems	Understand design constraints of digital systems. And Combinational logic design implementation
CO2: Figuring the design and testability	Sequential logic design implementation and Design for testability.
CO3: Ruminating the control unit	Demonstrate control unit operations and concepualize instruction level parallelism
CO4: To imbibe memory and addressing modes	Categorize memory organization and explain the function of each element of a memory hierarchy
CO5: Understanding the CPU design	Identify and compare different methods for computer I/O assembly

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	2	1	-	3	2	2	1	1	-
CO2:	1	2	2	1	2	1	3	1	1
CO3:	3	2	2	2	2	3	1	2	-
CO4:	-	1	1	3	2	1	1	1	-
CO5:	2	2	1	3	-	-	1	1	-

Paper:16MScCS13 **Subject: Programming with C**

Course Outcome	Description
CO1: Fundamental Learning C language Environment	Familiar with programming environment with C Program structure.
CO2: Enhancement Skills in Decision and Control Statements	Ability to understand the Control Structure and function with code example.
CO3: Experimental Learning of structure data types and its programs	Aware about storage class specifier, Arrays and String concepts.
CO4: Dealing with pointers in C	Understand the concepts of pointer, memory allocations techniques, structure and unions.
CO5: Understand and implementation of various file operations	Managing File operations, file handling functions and graphics functions.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	-	1	2	3	1	-	-	-	-
CO2:	1	2	3	1	2	2	2	2	-
CO3:	2	1	3	3	2	3	2	2	1
CO4:	1	2	2	2	3	3	3	2	-
CO5:	1	3	3	-	2	3	2	2	1

Paper:16MScCS14 **Subject:System Software**

Course Outcome	Description
CO1:Fundamenatls of system software and Architectures	To understand the basics of system software and machine architecture with examples.
CO2:To gain the knowledge of Assemblers	Ability to learn basics Assembler functions, Features and design options (pass-1 and pass-2 algorithms).
CO3: Understand the various concepts of Loader and linkers.	Definition, Functions , machine dependent and independent features.
CO4: Experimental learning of various phases of macro processors.	Descriptions of features with algorithms
CO5: To understand basics of Compilers	Inculcating the knowledge of functions, features and options of compiler

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	-	1	1	3	1	-	2	-	-
CO2:	1	2	3	2	3	2	1	-	1
CO3:	2	2	1	2	2	2	2	-	-
CO4:	1	2	1	2	3	2	3	-	-
CO5:	1	2	3	3	2	3	2	1	-

Paper:16MScCS15 **Subject:Data Structures**

Course Outcome	Description
CO1: Understand the concept of memory management and algorithm techniques	Understand and remember algorithms and its analysis procedure, methods impact the performance of program and Searching Techniques
CO2: Ability to understand different sorting and searching techniques	Able to understand and analyze elementary algorithms: sorting, searching and hashing
CO3: Understanding the basic data structure and its operations	Introduce the concept of data structures through ADT ,stack,queue,Linear List, Linked List
CO4: Understand and implement the concept of linear Data structure with Pseudo Algorithm	To make students familiar with Design and implement the data structures such as linked list, stack, queue using array and how to work with recursive algorithms
CO5:Understand and implement the concept of Non linear Data structure	To understand the concept of tree and graphs by using C as the programming language using static or dynamic implementations

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	2	2	3	2	2	2	2	-
CO2:	2	2	3	2	3	2	3	3	-
CO3:	3	2	3	3	3	3	2	2	-
CO4:	2	2	3	3	2	3	2	2	1
CO5:	2	3	3	3	2	3	2	2	-

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Paper:16MScCS16 Subject: Problem solving using C Lab.

Course Outcome	Description
PCO1: Implementation of basic programs	The students will learn about Simple C Programs with basics like data types, functions.
PCO2:An ability to implement conditional and controls statements	Learn the ability to implement various concepts like area of different shapes , quadratic equations and sorting techniques
PCO3:Attain the knowledge of Strings ,pointers and structures.	An ability to implement string functions, pointers and structures
PCO4: Demonstration of pointers with array and files	Learning the program implementation of array of pointers, and Matrices

Mapping of CO's with PO's and PSO's

PCOS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PCO1:	1	2	2	2	1	2	2	-	-
PCO2:	2	3	2	3	3	2	2	2	-
PCO3:	3	2	3	3	2	3	3	2	-
PCO4:	3	3	2	3	2	3	2	3	-

Paper:16MScCS17 **Subject:Data Structure Lab.**

Course Outcome	Description
CO1:Ability to implement the basics of Data Structure	Select appropriate data structures as applied to specified problem definition.
CO2: An state of arts to implements the various Data structure operations	Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.
CO3: Ability to implement on Stack, queues and linked list concepts	Students will be able to implement linear and Non-Linear data structures.
CO4: Implementation of various Searching and sorting techniques	Implement appropriate Insertion sorting/Linear, Sentinel searching technique for given problem.
CO5: Implementation Non Linear Data Structure and its operations	Design advance data structure using Non-Linear data structure like Trees and Graphs.
CO6: implementation of stack applications using stack methods	Design and implement the Application of stack-Reversing a series, conversion from Decimal to Binary, Postfix evaluation, transformation and others.
CO7:State of art to implement Menu Drive Operations	To implement the Menu Driven program for Stack, Linked List, queues, trees, and graph other techniques.
CO8: Understanding the concept of Searching techniques	To implement Different searching techniques like BFS and DFS

Mapping of CO's with PO's and PSO's

PCOS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PCO1:	2	2	2	3	2	3	2	-	-
PCO2:	2	3	2	2	3	3	3	-	-
PCO3:	1	2	3	3	1	3	1	-	-
PCO4:	3	2	3	2	2	3	1	-	-
PCO5:	2	2	3	2	3	3	2	2	-
PCO6:	1	2	3	2	2	3	2	2	-
PCO7:	2	3	3	2	3	2	2	2	-
PCO8:	2	2	3	2	2	2	2	1	-

Paper:16MScCS18 Subject:Self Study (JavaScript & Web Technology)

Course Outcome	Description
CO1:Understand the java script basics	Ability to understand environment of Java Script
CO2:Embedding the JS in HTML	To understand the java scripts and HTM Documents.
CO3: Learning the significance of Dynamic coding.	An ability to learn Dynamic Documents with JavaScript.
CO4:Understand the knowledge of basics of Internetwork	To understand Environment of Web Foundations, Evolution of the websevers and browsers.
CO5:Learning the basics of XML, CSS and CGI	An ability to understand XML documents with different styles and concepts of Perl and CGI.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	2	2	3	2	2	2	3	2	-
CO2:	3	2	3	2	3	3	2	3	-
CO3:	2	3	2	3	3	3	2	1	-
CO4:	1	1	1	3	1	1	1	2	-
CO5:	2	2	3	3	2	3	2	3	-

Semester – II

Paper:16MScCS21 Subject:Object Oriented Programming with C++

Course Outcome	Description
CO1:Ability to learn the concept of OOP's.	Understand the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
CO2:To Deduce the knowledge of memory management functions	Understand dynamic memory management techniques using pointers. Etc
CO3:Attaining the knowledge of Constructor,destructor anfd functions.	Understanding the usage of constructors, destructors, function overloading, operator overloading, virtual functions and polymorphism.
CO4:Implementation of Inheritance, Exception handling.	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming and C++ I/O system basics.
CO5:Gain the knowledge of Standard Template library	Ability to learn about Standard Template library and iterators.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	1	1	2	1	1	1	-
CO2:	1	1	2	2	2	3	2	2	-
CO3:	2	1	2	2	2	1	1	1	-
CO4:	3	3	3	2	3	3	3	2	-
CO5:	1	2	3	1	2	1	2	2	-

Paper: 16MScCS22 Subject:Database Management Systems

Course Outcome	Description
CO1: Deduce the basics of dbms	Understand the fundamental elements of relational database management systems
CO2: Understand the relational model.	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
CO3: Understand the issues in designing the ER model	Design ER-models and convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
CO4: An ability to normalize the database	Improve the database design by normalization.
CO5: Understand the database structuring.	Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	3	1	1	1	1	-	-
CO2:	2	2	3	1	1	2	1	-	-
CO3:	1	1	1	2	2	2	2	-	-
CO4:	2	3	3	3	2	3	3	2	-
CO5:	2	2	3	3	3	3	2	3	-

Paper:16MScCS23 **Subject:Operating System Concepts**

Course Outcome	Description
CO1:Deduce the basics of OS	Understand the process management policies and scheduling of processes by CPU.
CO2:Understand the process synchronization	Evaluate the requirement for process synchronization and coordination handled by operating system.
CO3:Understand the memory management	Understand and analyze the memory management and its allocation policies.
CO4: Understand the significance of storage management.	Identify use and evaluate the storage management policies with respect to different storage management technologies.
CO5:Ability to manage any OS	Identify the need to create the special purpose operating system.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	1	2	1	1	1	-	-
CO2:	1	1	1	2	1	1	1	-	-
CO3:	2	2	1	2	2	2	2	1	-
CO4:	2	1	2	2	3	2	1	2	-
CO5:	1	2	3	2	2	2	2	3	-

Paper:16MScCS24 Subject:Data Communications and Networks

Course Outcome	Description
CO1: An ability to learn the basics of a data communications system and network models	Gaining the knowledge of Networks, Internet,OSI and TCP/IP protocols and addressing
CO2: Understand the concepts of Data and signal.	Deduce the Periodic analog and digital signals, Transmission impairments, digital transmission and transmission modes.
CO3: Gaining the knowledge of Physical layers and media.	Learning Analog transmission Signal Conversion and Transmission Media.
CO4: Understand the concepts of Switching and telephone networks.	Describing different types of Switching, telephone networks, Modems, Digital Subscriber Line, Cable – tv networks
CO5: An ability to learn about the various error detection and correction schemes	Getting the knowledge of error detection and correction , Data Link Control and Multiple Access.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	2	2	3	1	1	1	-	-
CO2:	1	1	2	3	1	1	1	1	-
CO3:	1	1	1	2	1	1	2	2	-
CO4:	1	1	2	3	2	2	3	3	-
CO5:	3	2	3	3	3	3	3	3	-

16MScCS26 OOP with C++ Programming Lab.

Course Outcome	Description
CO1:Implementaion of class concepts .	An ability to learn the procedural and object oriented paradigm with concepts of control structures, classes, functions, data and objects.
CO2:Implementation of features of OOP's	To understand the concept of function overloading, operator overloading, virtual functions and polymorphism.
CO3:Demonstration of polymorphism	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
CO4:Demonstration of Templates, I/O files and STL	Demonstrate the use of various OOPs concepts with the help of Templates, IO files and STL.
CO5:Signifince of algorithm with practical approach	To learn about the design and analysis of algorithm

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PCO1:	1	1	2	3	2	3	2	2	-
PCO2:	2	2	1	2	2	2	2	1	-
PCO3:	1	1	2	2	2	2	2	1	-
PCO4:	2	2	3	3	2	3	2	1	-
PCO5:	3	2	3	3	3	2	3	3	-

Paper:16MScCS27 Subject: Visual Programming and DBMS Lab.

Course Outcome	Description
CO1:Implementation of GUI controls simple programs	Design and implement simple calculator, color change, world count and word search using various lopping statements.
CO2: Implementation of advanced controls through GUI	Design and implement menu function of uploading picture by common dialogue box, Design and implement on conversion Decimal to fraction
CO3: Designing and testing the different validation techniques	Designing page for validation control by declaring various concepts, forms, comments and controls
CO4:Building two tier applications	Expertise the concept by the technology (MySQL/PostgreSQL) and Familiarize the commands under DML and DDL.
CO5: Implementation of integrity constraints through application	Understand the vitality of integrity constraints.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PCO1:	1	1	1	2	1	1	1	-	-
PCO2:	2	2	2	3	2	2	2	2	-
PCO3:	3	2	3	3	2	3	2	2	-
PCO4:	3	3	3	3	3	3	3	3	-
PCO5:	3	3	3	3	3	2	3	3	-

16MScCS28 Self Study: (Statistical Methods and Graph Theory)

Course Outcome	Description
CO1: To understand the Basic Concepts of Graph	An ability to understand the Basic Concept of Graph theory, Connectivity and paths
CO2: State of an arts to understand Real world application	To understand the concepts of graph coloring and real word application.
CO3: To learn about different techniques	To learn about the Description of data, various plots and filtering techniques.
CO4: Understanding the Correlations and regression	An ability to understand Correlations and Regression concepts.
CO5: Understand the Different testing methods	A state of art of sampling methods and Hypothesis testing techniques.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	2	2	2	1	1	-	-
CO2:	2	2	2	3	2	1	1	2	-
CO3:	2	2	3	3	2	2	2	2	-
CO4:	2	2	2	3	2	2	2	3	-
CO5:	2	3	2	3	3	2	2	2	-

Semester - III

Paper:17MScCSCS3.1 **Subject: Software Engineering**

Course Outcome	Description
CO1:Introduction to Software Engineering	To understand the nature of Software Engineering, and software life cycle, Process models & also the emergent and non-emergent properties of the software.
CO2:Gaining the knowledge of requirements System models	Ability to learn about Software Requirements Specification, System Models, Critical systems & formal systems Specification.
CO3:Understand the significance of Software design	To understand the concept & principles of software design & principles of effective user interface.
CO4: Ability to understand Software development methods.	Ability to understand Rapid Software Development, reuse of software, Component based software engineering and software evolution.
CO5:Attain the knowledge of verification , Validation and management.	To know the basics of testing and understanding the concept of software quality management, software cost estimation and software configuration management process.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	3	1	1	3	1	1	1	2	-
CO2:	2	2	1	3	2	2	2	3	-
CO3:	2	2	3	3	1	2	2	3	-
CO4:	3	2	2	3	2	3	2	3	2
CO5:	3	3	3	2	3	3	3	3	-

Paper:17MScCSCS3.2 Subject:Computer Networks and Security

Course Outcome	Description
CO1: perceive the basics and applications of networking	Understand network architectures and classifications, different networking protocols.
CO2: Learning the vitality of layers in protocol suite	Understand the functions of each layer in OSI and TCP/IP model.
CO3: Learning the network management protocols	Understand various network applications, and network security considerations.
CO4: Ability to understand the routing protocols	Understand network security services and mechanisms and Classify the routing protocols and analyze how to assign the IP addresses for the given network.
CO5:Study the Significance of security	Various network security applications, IPSec, Firewall, IDS, Web security, Email security, and Malicious software etc.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	2	2	1	1	1	-	-
CO2:	1	1	1	3	2	1	1	2	-
CO3:	1	2	1	2	1	2	1	1	-
CO4:	2	1	2	3	3	3	3	2	-
CO5:	2	2	1	3	2	3	2	3	-

Paper:17MScCSCS3.3 Subject:Object Oriented Programming in Java:

Course Outcome	Description
CO1: Ability to understand the environment of Java programming language	Understand how to design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions, arrays, different type of methods with implementation.
CO2: To understand the concepts, principles and demonstrations on different methods and packages.	Discuss the principles of inheritance, interface and packages and demonstrate though problem analysis assignments how they relate to the design of methods, abstract classes and interfaces and packages.
CO3: Learning the importance of different Mechanisms	Understand importance of Multi-threading & different exception handling mechanisms.
CO4: Ability to understand Frame work Collections with file operations.	Learn the experience of Frame work collection in java and handling with file operations.
CO5: Ability to learn the real world Applications with different Techniques.	Understand Java Swings for designing GUI applications, container, layout management Java using applet and AWT that respond to different user events.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	2	2	1	2	1	2	2	1	-
CO2:	2	2	2	3	2	2	2	2	1
CO3:	3	2	2	3	2	3	2	2	-
CO4:	3	2	3	3	2	3	3	2	-
CO5:	3	2	3	1	2	2	2	1	-

Paper:17MScCSCS3.4 **Subject:Web Programming**

Course Outcome	Description
CO1: To understand the basics of webpage development.	Understand, analyze and apply the role of languages like HTML, CSS, XML, JavaScript & protocols in the workings of web and it's applications.
CO2:An ability to learn the concept of PHP and database connectivity.	Creation of server side scripting, Installation of PHP and Using PHP/MYSQL, students will learn about developing web applications.
CO3:To attain the basics of Ruby programs	To learn about Ruby on Rails, it provides a lot of code, making it quick and simple to create skeletal applications that are both highly customizable and extendable.
CO4:Deduce the knowledge of JDBC connectivity	An ability to learn about JDBC implementations, Networking and servelets.
CO5:Learning the simple concept of AJAX	Understand the basics of AJAX and Rails with AJAXand program implementations.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	2	2	3	2	1	1	1	-
CO2:	2	2	3	2	3	3	3	3	-
CO3:	2	2	3	2	3	3	2	3	-
CO4:	3	2	3	2	3	3	3	3	-
CO5:	2	2	3	1	2	2	2	2	-

Paper:17MScCSCS3.5 Subject: Internet of Things

Course Outcome	Description
CO1: Fundamentals of IoT	Interpret the vision of IoT from a global context.
CO2:Ability to learn the design methodology and application programming	Determine the Market perspective of IoT.Python programming
CO3: Understanding Raspberry-PI	Compare and Contrast the use of Devices, Gateways and Data Management in IoT.
CO4: Understanding the GALILEO/ARDUINO	Implement state of the art architecture in IoT.
CO5: Learning various realtime applications	Illustrate the application of IoT in Industrial Automation and identify Real World Design Constraints.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	2	2	3	2	2	2	2	-
CO2:	1	2	2	3	2	2	2	1	-
CO3:	2	3	3	2	3	3	3	2	-
CO4:	3	2	3	3	2	2	2	3	-
CO5:	3	2	3	2	2	3	2	2	-

Paper:17MScCSCS3.7 **Subject:Web Programming Lab**

Course Outcome	Description
CO1: To attain the knowledge of webpage development.	An ability to design WebPages or web documents using XHTML,CSS and JavaScript languages.
CO2:To learn the implementation of PHP programs	An ability to learn PHP Programs and maintain database which will help to develop mini projects.
CO3:An ability to learn the basics of servelets and jsp	Understand and implement the advanced concepts of JAVA such as Servelets & JSP to create dynamic Web Pages.
CO4:Understand the concept of JDBC and MYSQL.	An ability to maintain database in application using JDBC and MYSQL.
CO5: To attain the knowledge of Ruby on rails programs	An ability to develop application software using RUBY on Rails.

Mapping of CO's with PO's and PSO's

PCOS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PCO1:	1	2	2	3	2	1	1	1	-
PCO2:	3	2	3	2	3	3	3	3	-
PCO3:	2	2	2	2	3	3	2	2	-
PCO4:	3	2	3	2	3	3	3	3	-
PCO5:	2	2	3	3	2	2	2	2	-

Paper:17MScCSCS3.8 Subject:JAVA and Network LAB

Course Outcome	Description
CO1: Understand the basics	Expertise the basics of programming construct.
CO2:Ability to learn best programming practices	Understand the significance of overloading and overriding.
CO3:Gaining the knowledge of GUI	Understand the significance of exception handling and exercising the skills of GUI in java.
CO4: Ability to build network applications	Upgrade the skills of networking (TCP and UDP).
CO5: Ability to develop Network management protocols.	Simulate the network protocols (PING, ARP, ECHO etc.) and Implementation of File server.

Mapping of CO's with PO's and PSO's

PCOS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PCO1:	2	2	1	3	1	1	1	2	-
PCO2:	2	1	3	2	3	3	2	2	-
PCO3:	3	2	3	2	2	2	3	3	-
PCO4:	3	2	2	3	2	3	2	2	-
PCO5:	3	2	3	2	3	3	3	2	-

Semester - IV

Paper:17MScCSCS4.1 **Subject: Optimization Techniques**

Course Outcome	Description
CO1: Understand the operational research models.	Identify and develop operational research models from the verbal description of the real system.
CO2: An ability to solve optimization problems	Understand the mathematical tools that are needed to solve optimization problems.
CO3:To familiarize the SPSS software	Use mathematical software to solve the proposed models.
CO4: Understand and analyze the network models	Develop a report that Understands the network model using solving technique like CPM andPERT
CO5: Understand and analyze the results and ability to make decisions	Develop a report that Understands the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	2	1	-	3	3	2	3	-	-
CO2:	3	2	-	3	3	3	2	-	-
CO3:	3	3	3	1	2	3	2	3	-
CO4:	2	2	1	1	1	2	1	-	-
CO5:	2	1	1	-	2	2	2	2	-

Paper:17MScCSCS4.2 **Subject: Data Mining**

Course Outcome	Description
CO1: Learning the basic concept of Data Mining.	Understand the functionality and related technologies of the various data mining techniques, Knowledge representation methods and its application.
CO2:Understand the concept of Data warehouse, OLAP and Preprocessing	Appreciate the strengths and limitations of various data mining and data warehousing models, Data Pre-Processing and Data mining Representation.
CO3:Learning the Attribute-oriented analysis.	Explain the analyzing techniques and algorithms of various data
CO4: Attaining the knowledge of algorithms with WEKA Tool	Understand different methodologies used in data mining and data ware housing with different algorithms and its prediction.
CO5:The concept of evaluations and Experiments' with techniques	Compare and evaluate different approaches of data ware housing and data mining with experiments, methods and technologies.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	1	3	1	1	1	-	-
CO2:	1	2	1	3	2	2	1	1	-
CO3:	1	2	3	1	3	3	2	3	-
CO4:	2	3	2	3	2	2	2	3	-
CO5:	2	3	2	1	2	2	3	3	-

Paper:17MScCSCS4.3 **Subject: Digital Image Processing**

Course Outcome	Description
CO1: To understand the Digital Image Fundamentals.	Review the fundamental concepts of a digital image processing system.
CO2: Ability to learn Image Enhancement in Spatial Domain	Analyze images in the spatial domain using various transforms.
CO3: Ability to understand & learn Image Enhancement in Frequency Domain	Understand the concepts of images in the Frequency domain using various transforms.
CO4: To attain the Knowledge of image restoration	Evaluate the techniques for image enhancement and image restoration and color processing.
CO5: To understand the Concept and techniques of Image Segmentation	Evaluate the techniques for image enhancement and image segmentation and morphological processing.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	2	1	3	1	1	1	-	-
CO2:	2	2	2	2	2	2	3	3	-
CO3:	3	3	3	1	3	3	2	3	-
CO4:	3	3	3	1	2	3	2	2	-
CO5:	1	2	3	-	2	2	2	3	-

Paper:17MScCSCS4.4 **Subject: Computer Graphics**

Course Outcome	Description
CO1: An ability to learn the basic concepts of Computer graphics.	To provide comprehensive introduction about Computer Graphics System, different design algorithms.
CO2: Understand 2D transformations and clipping algorithm.	To make the students familiar with 2D Graphics transformations,2D viewing techniques of clipping algorithms.
CO3:To attain the concept of 3D Concepts.	To provide detail knowledge about 3D object representation with different surfaces and 3D Geometric transformation.
CO4: An ability to learn visible surface detection methods	Understanding of visible surface detection methods like classification, back-face detection, depth-buffer, scan-line etc.
CO5: To understand the computer animation.	The Computer Graphics course prepares students for activities involving in animation.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	1	3	3	1	1	1	-
CO2:	2	2	3	2	3	3	3	3	2
CO3:	2	2	3	2	3	3	3	3	2
CO4:	2	3	1	2	3	1	3	2	-
CO5:	2	2	3	1	2	3	2	3	-

Paper:17MScCSCS4.5 Subject: Object Oriented Analysis and Design using UML:

Course Outcome	Description
CO1:To understand the basic concept of OOPS.	An ability to apply knowledge of OOPs concepts in Object Oriented Design.
CO2: Learn to apply the UML notations and different types of diagrams.	An ability to analyze the case study and apply the UML notations and also apply a class diagram, object diagram, activity diagram and state for user requirements.
CO3:An ability to learn diagrams and developing components.	To understand and learn about Architecture diagram, deployment diagrams and Interface diagrams to develop components of applications.
CO4:To learn the significance of encapsulation and Cohesion.	An ability to get the knowledge of Encapsulation Cohesion which will help to develop Software.
CO5:To understand the significance of diagrams	Apply component and deployment diagram for based on Requirements

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	1	1	1	3	1	1	1	-	-
CO2:	1	1	2	2	1	2	2	2	-
CO3:	2	2	3	1	2	2	2	2	-
CO4:	1	1	2	2	2	1	1	2	-
CO5:	2	1	1	3	2	3	2	1	-

Paper:17MScCSCS4.6 Subject: Computer Graphics Lab:

Course Outcome	Description
CO1:An ability to learn to implement simple interaction programs	Understand and learn about drawing the basic primitives, mouse interaction events and line and ellipse drawing algorithms.
CO2:To deduce the different algorithms of filling	An ability to learn about filling algorithms like flood fill and boundary fill.
CO3: Understanding the 2D program implementations.	To learn about area filling algorithms, and 2d transformations.
CO4: To learn the curve generations and clipping.	Understand to implement curve Generation and clipping algorithms
CO5:to learn the vitality of animation and 3D Transformations.	An ability to implement 3D transformations, Fractal Generations and program for Animation.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1:	2	3	3	1	2	3	2	2	-
CO2:	2	3	2	2	3	3	3	2	-
CO3:	3	3	2	2	3	3	2	2	-
CO4:	2	3	3	2	3	3	2	3	-
CO5:	3	3	3	1	3	3	3	3	-

Paper:17MScCSCS4.7 **Subject: Project work**

Course Outcome	Description
CO1: Review the literature and develop solutions for framed problem statement.	Plan, analyze, design and implement a software project or gather knowledge over the field of research and design or plan about the proposed work.
CO2: Implement hardware and/or software techniques for identified problems.	Demonstrate the ability to locate and use technical information and hardware requirement from multiple sources.
CO3: Test and analyze the modules of planned project.	Ability to implement the project, and apply testing methods to different modules.
CO4: Write technical report and deliver presentation.	Learn to work as a team and to focus on getting a working project done on time with each student being held accountable for their part of the project.
CO5: Apply Software Engineering and management principles to achieve project goal.	Learn about and go through the software development cycle with emphasis on different processes - requirements, design, and implementation phases.

Mapping of CO's with PO's and PSO's

COS/PO'S PSO'S	PO1	PO2	PO3	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
PCO1:	2	3	-	3	2	1	-	1	2
PCO2:	2	2	2	1	3	-	-	2	-
PCO3:	3	2	3	1	3	2	2	2	-
PCO4:	2	-	-	-	-	-	1	3	3
PCO5:	3	3	3	-	2	3	1	3	-

Evaluation Mapping -Theory

Evaluation Pattern : 20 Marks Internal Assessment Test

80 Marks University End Examination

Question Paper Pattern: 16 Marks Each, questions of any of these Combinations like

2, 4,5,6,8,12,16 Marks

2 Marks(Objective)

5 Marks(Descriptive)

4,8,10,12,18 Marks(Numerical/Analytical/Descriptive and Programs)

Parameters of Patterns:

1. Skill Based
2. Understanding
3. Logical Ability
4. Numerical/Analytical
5. Descriptive/Diagram
6. Programming Skills

Evaluation Mapping

Sl.No	Parameter	Percentage
1	Skill Based	10%
2	Understanding	15%
3	Logical Ability	5%
4	Numerical/Analytical	15%
5	Descriptive/Diagram	20%
6	Programming Skills	35%
		100%

Evaluation Mapping – Practical

Evaluation Pattern: 20 Marks Internal Assessment Test

80 Marks University End Examination

Writing of Programs : 30 Marks (Each Program carries 15 Marks)

Execution of programs: 30Marks (Each program carries15 marks)

Viva-Voce : 10Marks

Journal / Laboratory Report: 10Marks

Total : 80Marks

Evaluation Mapping:

Sl.No	Parameter	Percentage
1	Skill Based	10%
2	Understanding	15%
3	Logical Ability	5%
4	Numerical/Analytical	15%
5	Descriptive/Diagram	20%
6	Programming Skills	35%
		100%

Evaluation Mapping – Project Work

Evaluation Pattern: 20 Marks Internal Assessment Test

80 Marks University End Examination

Question Paper Pattern:

Dissertation	:	35 Marks
S/W Demo/Presentation	:	35 Marks
Viva – Voce	:	10 Marks
Total Marks	:	80 Marks

Parameters of Patterns: 1. Skill Based

2. Understanding
3. Logical Ability
4. Numerical/Analytical
5. Descriptive/Diagram
6. Programming Skills

Evaluation Mapping:

Sl.No	Parameter	Percentage
1	Skill Based	25%
2	Understanding	15%
3	Analytical / Logical Ability	10%
4	Descriptive/Diagram	15%
5	Programming Skills	35%
		100%

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