# B.L.D.E. Association's
# S. B. ARTS & K. C. P. SCIENCE COLLEGEVIJAYAPUR

**Re-accredited at the 'B++' Level by NAAC with 2.99 C.G.P.A in IV Cycle**

## M.Sc. (CS) Programme

# PROGRAM OUTCOME

# &

# COURSE OUTCOME

## 2023-2024

B.L.D.E. ASSOCIATION'S
S.B.ARTS AND K.C.P SCIENCE COLLEGE, VIJAYAPUR
RE-ACCREDITED AT THE 'B++' LEVEL
M.Sc(CS) Programme

## Program Outcome

| POs | Description |
|---|---|
| PO1 | **Acquiring fundamental knowledge**: Capability to learn basic concepts and methods of various subjects |
| PO2 | **Building skills on Problem solving techniques andmethods** :Learning programming languages through pseudo code, algorithm and flowchart, decision making techniques andbuilding logical skills |
| PO3 | **Demonstration of experimental methods** :Acquiring the knowledge by implementing the algorithms using technologies. |
| PO4 | **Enhancement of skills**: Ability to design, develop and integrate the system and application programs through IDE and tools. |
| PO5 | **Project work** :Applying the computer science skills like analysis, design,development testing and deployment to produce to computing based solutions |
| PO6 | **Presentation and communication skills** :Ability to engage independent and lifelong learning in thebroadest context. |

## Course Outcome

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc.-I Sem | Discrete Mathematical Structure | CO1 | Understand Sets and logics of mathematical thinking, mathematical Proofs and to apply them in problem solving. |
| | | CO2 | Learning Proofs and functions |
| | | CO3 | Ability to understand graphs& diagraphs, Paths & Cycles, Hamiltonian Cycles. |
| | | CO4 | Learn to understand use of trees, it's significance in Programming Applications. |
| | | CO5 | Understand concept of groups and codes in Encoding- Decoding and Error detection. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc.-I Sem | Database Management Systems | CO1 | Learn the database, abstraction and integration, pros and Cons, Entity Relationship Model. |
| | | CO2 | Understand the basic concept of File organization& storage, operation in files, hashing techniques and also types of indexes. |
| | | CO3 | Learn the basic Concept of Relational data Model, database manipulation using SQL, relational Database Design |
| | | CO4 | Understand the transaction Processing |
| | | CO5 | Acquire the knowledge of the database recovery techniques & algorithms. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc.-I Sem | Data structure using C++ | CO1 | Understanding Basic of Programming Concept & Classes and Objects |
| | | CO2 | Ability to Understand Overloading, Namespace and Inheritance |
| | | CO3 | Learn the Concept of Data Structure. |
| | | CO4 | Acquire the concept of data structures through Stack, Queue with Program Implementation |
| | | CO5 | Understanding the concepts of Linked List with Program implementation |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc.-I Sem | Database Management Systems -Lab | CO1 | Design and implement database schema for a customer-sale scenario |
| | | CO2 | Database Schema for a Student Library scenario to evaluate DDL , DML,DCL and TCL commands. |
| | | CO3 | Database Schema for a Employee-pay Scenario by applying join operation on multiple tables, inner, outer, left and right outer join operations |
| | | CO4 | Schema for a Video Library scenario by applying Learning Aggregate function on Data base MIN MAX Count, Avg etc |
| | | CO5 | Database Schema for a student-Lab scenario to learn and execute Views, group by order by |

| | | | and between clauses on all data base relations |
|---|---|---|---|
| **Class** | **Subject** | **Course Outcome** | **Description** |
| M.Sc.-I Sem | Data structure using C++ Lab | CO1 | Ability to implement the basics of Data Structure |
| | | CO2 | Learn implement the various Data structure operations and Sorting Techniques. |
| | | CO3 | Understand the concept of Stack, queues and linked list. |
| | | CO4 | Learn the concept of various Searching and Sorting techniques. |
| | | CO5 | Implementation of stack applications. |
| | | CO6 | State of art to implement Menu Driven Operations . |
| | | CO7 | Understand the concept of Searching techniques |

| **Class** | **Subject** | **Course Outcome** | **Description** |
|---|---|---|---|
| M.Sc.-I Sem | Computer System Architecture | CO1 | Ability to learn Computer Data Representation |
| | | CO2 | Understand Input, output and interrupt, Complete computer description, design of Basic Computer, design of Accumulator Unit |
| | | CO3 | Acquire the knowledge of Control Memory, Address sequencing, Micro program Example, design of control Unit |
| | | CO4 | Learn Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC) |
| | | CO5 | Understand Flynn's taxonomy, Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction, Pipeline, RISC Pipeline, Vector Processing, Array Processors |

| **Class** | **Subject** | **Course Outcome** | **Description** |
|---|---|---|---|
| M.Sc.-I Sem | Programming using Java | CO1 | 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 | 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 | Understand importance of Multi-threading & different exception handling mechanisms. |
| | | CO4 | Learn the experience of Frame work collection in java and handling with file operations. |
| | | CO5 | Understand Java Swings for designing GUI applications, container, layout management Java using applet and AWT that respond to different user events |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-II Sem | Web Programminf | CO1 | Understand, analyze and apply the role of languages like HTML, CSS, XML, avaScript & protocols in the workings of weband it's applications. |
| | | CO2 | Creation of server side scripting, Installation of PHP and Using PHP/MYSQL, students will learn about developing web applications. |
| | | CO3 | 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 | An ability to learn about JDBC implementations, Networking and servelets. |
| | | CO5 | Understand the basics of AJAX And Rails with AJAX and program implementations. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-II Sem | Programming using JAVA Lab | CO1 | Expertise the basics of programming construct. |
| | | CO2 | Understand the significance of overloading and Overriding. |
| | | CO3 | Learn the significance of exception handling and exercising the skills of GUI in java. |
| | | CO4 | Ability to Build Applet Code for student report read the inputusing text boxes and display the o/p using buttons. |
| | | CO5 | Learn to Implement the Concept of Threads and its types. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-II Sem | Web Programming -Lab | CO1 | An ability to design and Implement WebPages using client-side technologies like HTML,CSS and JavaScript |
| | | CO2 | Learn PHP Programs and maintain database which will help to develop mini projects. |
| | | CO3 | Understand and implement the advanced concepts of JAVA such as Servelets & JSP to create dynamic Web Pages. |
| | | CO4 | Apply Java Database Connectivity to server Side technologies for developing back-end database to support Web Applications. |
| | | CO5 | Learn to Develop application software using RUBY on Rails. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-II Sem | Data Communication and Computer Networks | CO1 | Gaining the knowledge of Networks, Internet, OSI and TCP/IP protocols and addressing. |
| | | CO2 | Deduce the Periodic analog and digital signals, Transmission impairments, digital transmission and transmission modes. |
| | | CO3 | Learning Analog transmission, Signal Conversion and Transmission Media. |
| | | CO4 | Describing different types of Switching, telephone networks, Modems, Digital Subscriber Line, Cable – tv networks |
| | | CO5 | Obtain the knowledge of error detection and correction, Data Link Control and Multiple Access. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-III Sem | C# and .NET Programming | CO1 | Understanding the Overview of Dynamic Web Page, Feature of ASP.NET, Windows Form and its Properties. |
| | | CO2 | Ability to Understand the difference of ADO and ASP, Data Set adapted and also fundamentals of XML. |
| | | CO3 | Working with type of Web Services and Caching. |
| | | CO4 | Learn Threads, features of Threads, WSDL, Security and Code Access with Permission. |
| | | CO5 | Understand C# Vs JAVA C# Features, Classes, Interface, Controls and Object Delegates, Reflection, VB.NET and Its Features |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-III Sem | Programming using Python | CO1 | Learn to install and working with basic programming concepts, function variable string operations |
| | | CO2 | Get the knowledge of Boolean Types , importing Modules, Methods and their types. |
| | | CO3 | Understanding lists, functions/operations to work on them, looping and conditional statements. |
| | | CO4 | Learn File operations, tuples and sets operations, storing data in Collections and accessing, and their comparison. |
| | | CO5 | Applying class and object in python, Pluggings, Creating GUI Apps, Adding various Widgets, Forms, inserting Shapes |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-III Sem | C# and .NET Programming -Lab | CO1 | Enumerations programming constructs and encapsulation, polymorphism . |
| | | CO2 | Learn to implement Arrays and String Methods. |
| | | CO3 | Implementation of Console Application. |
| | | CO4 | Using ASP.NET learn to implement Operator overloading. delegates, events, errors and exceptions. |
| | | CO5 | Use of different properties in C#, Demonstrate Command line arguments processing, Use of Virtual and override keyword in C# |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-III Sem | Python Programming -Lab | CO1 | Attain the knowledge of arrays and functions. |
| | | CO2 | To understand the searching and sorting techniques |
| | | CO3 | Understanding the stack applications. |
| | | CO4 | Applying basic quadratic formula to the integers and working with matrix in list collection. |
| | | CO5 | Learn to implement string functions with required operations on word, sentence status. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-III Sem | Software Engineering | CO1 | To understand the nature of Software Engineering, and software life cycle, Process models & also the emergent and non-emergent properties of the software. |
| | | CO2 | Ability to learn about Software Requirements Specification, System Models, Critical systems & formal systems Specification. |
| | | CO3 | To understand the concept & principles of software design &principles of effective user interface. |
| | | CO4 | Ability to understand Rapid Software Development, reuse of software, Component based software engineering and software evolution. |
| | | CO5 | To know the basics of testing and understanding the concept of software quality management, software cost estimation and software configuration management process. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-IV Sem | Digital Image Processing | CO1 | To understand the Digital Image Fundamentals. |
| | | CO2 | Ability to learn Image Enhancement in Spatial Domain |
| | | CO3 | Understand the concepts of images in the Frequency domain using various transforms. |
| | | CO4 | Evaluate the techniques for image enhancement and image restoration and color processing. |
| | | CO5 | Understand the concept to evaluate the techniques for image enhancement and images segmentation and morphological processing. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-IV Sem | Artificial Intelligence | CO1 | Detailed Introduction to AI and its basic programming, constraints |
| | | CO2 | Understanding logical Agents and their orders, Real world applications and representation |
| | | CO3 | Understanding the analysis of AI in marketing and decision making technique and their implementation towards the uncertain outcome |
| | | CO4 | Reinforcement of robotics and learning how to design and implement probabilistic models |
| | | CO5 | Understating how to communicate by natural language processing for the real time implementation of Robotics |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-IV Sem | Digital Image Processing-Lab using MATLAB /Python | CO1 | Understand and implement the Program to change the spatial resolution Resize the images testing results using the "lenna" and "peppers" images. |
| | | CO2 | Implement program that would reduce the number of gray levels in PGM image from 256 to: (i) 128, (ii) 32, (iii) 8, and (iv) 2. |
| | | CO3 | To compute the histogram of an image, Implement the histogram equalization technique |
| | | CO4 | Implement the histogram specification technique |
| | | CO5 | Program to perform spatial filtering (i.e., correlation) of an image, Both the size of the mask and its values (i.e., weights) |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-IV Sem | Cloud Computing | CO1 | Understanding Overview, Applications, Intranets and the Cloud, First Movers |
| | | CO2 | Applications, Intranets and the Cloud, First Movers, : Cloud Computing Services |
| | | CO3 | Clients, Security, Network, Services, Applications, Web APIs, Web Browsers, Cloud Storage Providers, Standards |
| | | CO4 | Driving Forces, Company Offerings, Industries. Mobile Device Integration, Providers, Microsoft Online. Developing Applications: |
| | | CO5 | Mobile Device Integration, Providers, Microsoft Online. Developing Applications: |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-IV Sem | Data Mining Techniques | CO1 | Understand the functionality and related technologies of the various data mining techniques, Knowledge representation methods and its application. |
| | | CO2 | Appreciate the strengths and limitations of various data mining and data warehousing models, Data Pre- Processing and Datamining Representation |
| | | CO3 | Learn the analyzing techniques and algorithms of various data |
| | | CO4 | Understand different methodologies used in data mining and dataware housing with different algorithms and its prediction. |
| | | CO1 | Understand the functionality and related technologies of the various data mining techniques, Knowledge representation methods and its application. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-IV Sem | Data Mining Techniques | CO1 | Understand the functionality and related technologies of the various data mining techniques, Knowledge representation methods and its application. |
| | | CO2 | Appreciate the strengths and limitations of various data mining and data warehousing models, Data Pre- Processing and Data mining Representation |
| | | CO3 | Learn the analyzing techniques and algorithms of various data |
| | | CO4 | Understand different methodologies used in data mining and Dataware housing with different algorithms and its prediction. |
| | | CO5 | Compare and evaluate different approaches of data ware housing and data mining with experiments, methods and technologies. |

| Class | Subject | Course Outcome | Description |
|---|---|---|---|
| M.Sc-II Sem | Project Work | CO1 | Learn to 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 | Demonstrate the ability to locate and use technical information and hardware requirement from multiple sources. |
| | | CO3 | Ability to implement the project, and apply testing methods to different modules. |
| | | CO4 | 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 | Learn about and go through the software development cycle with emphasis on different processes - requirements, design, and implementation phases. |

## 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 |

**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% |

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## 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) |
| **Journal / Laboratory Report:** | 10Marks Total |
| **Viva-Voce** | 10Marks Total |
| **Total** | 80Marks |

## 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 | |

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