



**PSGR
Krishnammal College for Women**



**College of Excellence, *nirf* 2023 - 4th Rank
Autonomous and Affiliated to Bharathiar University
Reaccredited with A++ grade by NAAC, An ISO 9001: 2015 Certified Institution
Peelamedu, Coimbatore-641004**

DEPARTMENT OF DATA ANALYTICS (PG)

**CHOICE BASED CREDIT SYSTEM (CBCS) &
LEARNING OUTCOME BASED CURRICULAR FRAMEWORK (LOCF)**

**MASTER OF DATA ANALYTICS
2024 – 2026 BATCH & ONWARDS**



PROGRAMME LEARNING OUTCOMES

PLO1: Demonstrate understanding of the core concepts of analytics to discover data-driven insights

PLO2: Illustrate higher degree of technical skills that enable business decision making

PLO3: Apply analytical and managerial skills to enhance employment potential

PLO4: Exhibit holistic development with emphasis on values and ethics

PROGRAMME SPECIFIC OUTCOME

Graduates will be able to

PSO1: Demonstrate understanding of concepts in data science, statistical concepts and probability.

PSO2: Identify and analyze complex issues reaching substantiated conclusions using the techniques in data science.

PSO3: Design and propose innovative solutions for complex problems that meet the specified business needs.

PSO4: Ability to understand the industry requirements and to have sound knowledge about the professional skills required for data science.

PSO5: Create, select and apply appropriate techniques, tools, resources in data science for prediction and modeling of complex activities with an understanding of the limitation.

PSO6: Communicate effectively on complex tasks in profession as well as with society at large, such as, being able to comprehend and write effective reports, make effective presentations and provide as well as receive clear instructions.

PSO7: Apply ethical principles in research and commit to professional ethics and responsibilities.

PSO8: Recognize the need for lifelong learning and have the ability to engage in independent learning keeping in mind the rapid technological changes.



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DEPARTMENT OF DATA ANALYTICS (PG)

**CHOICE BASED CREDIT SYSTEM & LEARNING OUTCOME BASED
CURRICULAR FRAMEWORK SYLLABUS & SCHEME OF EXAMINATION**

MASTER OF DATA ANALYTICS – 2024 -2026 BATCH AND ONWARDS

SEMESTER I

Semester	Subject Code	Title of paper	Instruction Hrs / week	Contact Hrs	Tutorial Hrs	Duration of Examination	Examination Marks			Credits
							CA	ESE	Total	
I	MDA2301	Paper 1: Descriptive Statistics	4	58	2	3	25	75	100	4
I	MDA2302	Paper 2: Foundations of Data Science	4	58	2	3	25	75	100	4
I	MDA2303	Paper 3: Linear Algebra	4	58	2	3	25	75	100	4
I	MDA2404	Paper 4: Data Structures	4	58	2	3	25	75	100	4
I	MDA2305	Paper 5: Information Retrieval	4	58	2	3	25	75	100	4
I	MDA24P1	Lab1: RDBMS Lab	5	75	-	3	25	75	100	3
I	MDA23P2	Lab2: Full Stack Development Lab	5	75	-	3	25	75	100	3
I	17MONL1	Online Course	-	-	-	-	-	-	-	-

CA Question from each unit comprising of

One question with a weightage of 2 Marks : $2 \times 3 = 6$

One question with a weightage of 5 Marks (Internal Choice at the same CLO level) : $5 \times 3 = 15$

One question with a weightage of 8 Marks (Internal Choice at the same CLO level) : $8 \times 3 = 24$

Total : 45 Marks

ESE Question Paper Pattern: $5 \times 15 = 75$ Marks

Question from each unit comprising of

One question with a weightage of 2 Marks: $2 \times 5 = 10$

One question with a weightage of 5 Marks (Internal Choice at the same CLO level): $5 \times 5 = 25$

One question with a weightage of 8 Marks (Internal Choice at the same CLO level): $8 \times 5 = 40$

Continuous Assessment Pattern

Theory

CIA Test: 5 marks (conducted for 45 marks after 50 days)

Model Exam: 7 marks (Conducted for 75 marks after 85 days (Each Unit 15 Marks))

Seminar/Assignment/Quiz: 5 marks

Class Participation: 5 marks

Attendance: 3 marks

Total: 25 Marks

Practical Lab

Performance: 7 marks

Regularity: 5 marks

Model Exam: 10 marks

Attendance: 3 marks

Total: 25 marks

ESE Practical Pattern

The End Semester Examination will be conducted for a maximum of 75 marks respectively with a maximum 15 marks for the record and other submissions if any.

Marks allotted for attendance component in CA

91-100% attendance : 3 Marks

81-90% attendance : 2 Marks

75-80% attendance : 1 Marks

Course Code	Course Name	Category	L	T	P	Credit
MDA2301	DESCRIPTIVE STATISTICS	Theory	58	2	-	4

Preamble

The course introduces the measures of central tendency and dispersion. It also provides the students with systematic knowledge in correlation, regression and outlier analysis in R Programming.

Course Learning Outcomes

Upon the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Demonstrate the basic concepts of statistics	K2
CLO2	Apply the concepts of correlation, regression	K3
CLO3	Identify the methods for different measures of central tendency, dispersion	K4
CLO4	Evaluate the methods for representation of data.	K5
CLO5	Construct various plots, outliers for regression, diagnostics	K6

Mapping with Programme Learning Outcomes

CLOs/ PLOs	PLO1	PLO2	PLO3	PLO4
CLO1	S	M	S	S
CLO2	S	S	S	M
CLO3	S	S	M	S
CLO4	M	S	S	S
CLO5	S	S	M	S

S-Strong;M-Medium

Syllabus

UNIT I

(12 Hrs)

Introduction: **Nature and scope of Statistics, limitations of statistics** - Types of data: Concept of population and sample, primary and secondary data, quantitative and qualitative data, discrete and continuous data, cross-sectional and time series data. **Scales of measurement: Nominal, Ordinal, Ratio and Interval.** Case Studies using Statistical Methods in Excel.

UNIT II

(12 Hrs)

Tabulation of Data-Difference between Classification and Tabulation – Parts of Tabulation – Rules for Tabulation – Types of Tables Diagrammatic representations: - Line diagram, bar diagram, pie diagram and sub-divided bar diagram, **Frequency distribution and cumulative frequency distribution and their graphical representations, Frequency polygon, histogram, ogive, frequency curves, stem and leaf displays. Exploring R Basics – R Features – R Basic Data types – R Basic Operators – Data visualization in R.**

UNIT III**(12 Hrs)**

Univariate data: Different measures of location, dispersion, relative dispersion, **skewness and kurtosis**, Moments, Quantiles and measures based on them—comparison with moment Measures-**Box-plot and detection of outliers. Trimmed mean and Winsorised mean** – Simple problems. Interpretation of Histogram, Box Plot in R - Outliers on Univariate Data in R

UNIT IV**(11 Hrs)**

Correlation – Scatter diagram – Karl Pearson Coefficient of Correlation -Spearman’s Rank coefficient of Correlation - **Rank Correlation Coefficient**. Interpretation of Scatter Plot in R

UNIT V**(11 Hrs)**

Regression: Introduction – Uses of regression analysis – **regression lines – regression equations of X on Y and Y on X– regression equation in terms of correlation table**. Visualization plots for Linear Regression in R – Interpretation of Logistic Regression in R.

Text Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	S.C.Gupta, V.K.Kapoor	Fundamentals of Mathematical Statistics (Unit I : Chapter 1 , Price Michael (2018) , Excel 2019 In Easy Steps, - Chapter 8 (123 -133,135))	Sultan Chand & Sons, Tata MCGraw Hill	2019, 3 rd Revised Edition
2	R.S.N.Pillai and Bhagavathi	Statistics Theory and Practice (Unit II : Chapter 6: Pg 54 – 73, Chapter 7, Chapter 8: 100-112) (Unit IV :Chapter 12: Pg 396 - 420)	S. Chand Publishing Company Pvt Ltd	2019, 8 th Edition
3	R.Wilcox	Basic Statistics (Unit III: 2.1-2.5)	Oxford University Press	2009, 1 st Edition
4	S.P.Gupta	Statistical Methods (Unit V: Chapter 11)	Sultan Chand and Sons	2021, 46 th Edition
5	V.Bhuvaneshwari	Data Analytics with R Programming (Unit II :3-3.2,3.7-3.8, 4.3 Unit III : 4.4, 4.6, 9.2.1, Unit IV: 4.7,4.11, Unit V:6.3,6.9)	Scitech Publications Pvt Ltd	2018, 1 st Edition

Reference Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	Murray R Spiegel and Larry J Stephens	Statistics	Schaum's Outline	2008, 4 th Edition
2	R.S.N.Pillai	Statistics	S. Chand Publishing Company Pvt Ltd	1992, 8 th Edition
3	1. https://www.indiabix.com/data-interpretation/questions-and-answers/ 2. https://www.mathsisfun.com/data/pictographs.html			

Pedagogy

Lectures, Simulation exercises, Demonstration

Course Designers

1. Dr.T.A.Albinaa
2. Dr.N.Radha

Course Code	Course Name	Category	L	T	P	Credit
MDA2302	FOUNDATIONS OF DATA SCIENCE	Theory	58	2	-	4

Preamble

This course introduces the essential knowledge about foundations of data science with python. It provides various steps involved in the data science process and core python with advanced concepts like regular expressions, exception handling, multithreading. It also introduces the python libraries that are most commonly used for data analysis.

Prerequisite

- Basic understanding of Open source software
- Database concepts

Course Learning Outcomes

On successful completion of the course, the students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand data classification, process of big data technology, user Roles and skills in data science and its tools.	K2
CLO2	Apply the fundamental concepts, tools and techniques of data science In 360 view of Customer.	K3
CLO3	Analyze the methodologies of data science and its tools.	K4
CLO4	Evaluate the utilities and functionalities of Python	K5
CLO5	Design solutions for data analytics problems using Python.	K6

Mapping with Programme Learning Outcomes

CLOs/ PLOs	PLO1	PLO2	PLO3	PLO4
CLO1	S	M	M	M
CLO2	S	S	M	M
CLO3	S	S	S	S
CLO4	S	S	S	S
CLO5	S	S	S	S

S- Strong; M-Medium

Syllabus

UNIT I

(12 Hrs)

Data Evolution: Data Growth- a Perspective - IT Components - Business Process – Landscape - Data to Data Science -- Understanding data: Introduction - Types of Data: Numeric - Categorical – Graphical – High Dimensional Data - Data Classification - **Sources of Data: Time Series - Transactional Data -Biological Data -Spatial Data - Social Network Data** - Introduction to Python programming – Libraries – Plugins – Problem solving.

UNIT II

(12 Hrs)

Introduction to Data Science -**A Discipline –Data Science vs Statistics, Data Science vs Mathematics**, Data Science vs Programming Language, Data Science vs Database, Data Science vs

Machine Learning. Data Analytics - Data Manipulation with NumPy - Introduction to NumPy arrays and their operations-**Manipulating arrays: indexing, slicing, and reshaping** - Working with NumPy, Working with statistical toolbox.

UNIT III (11Hrs)

Relation: Data Science, Analytics and Big Data Analytics. Data Science Components –Big data technology - Data Science user - roles and skills – **Data Science use cases.** Introduction to the Pandas library - Loading and exploring datasets - **Data indexing and selection** – Data cleaning and preprocessing - Aggregation and summarization - Data ingestion: export/import data from various file formats (CSV, Excel, etc.).

UNIT IV (11Hrs)

Digital Data-an Imprint: Evolution of Big Data–What is Big Data–Sources of Big Data. **Characteristics of Big Data 6Vs –Big Data Myths** –Data Discovery-Traditional Approach. Introduction to data visualization - Plotting with Matplotlib: line plots, scatter plots, bar plots, and histograms – **Exploratory data analysis** - Data visualizations to explore and analyze datasets.

UNIT V (12 Hrs)

Big data Technology: Big Data Technology Process –**Big Data Exploration -Data Augmentation –Operational Analysis–Security and Intelligence.** Introduction to NLTK-Installing NLTK and downloading necessary Resources-Basic NLTK functionalities and data structures-Tokenization and Text Preprocessing: **Text cleaning and normalization techniques** - Exploring NLTK for text processing applications like sentiment analysis.

Text Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	V.Bhuvanewari, T.Devi	Big Data Analytics: A Practitioner’s Approach	Scitech Publications	2018, 1 st Edition
2	Wesley J.Chun	Core Python Programming Application Programming	Pearson Education Publication	2016, 3 rd Edition

Reference Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	Ulrich Matter	Big Data Analytics: A Guide to Data Science Practitioners Making the Transition to Big Data	Chapman & Hall Publication	2023, 1 st Edition
2	Mark Lutz	Programming Python	O’Reilly Media	2010, 4 th Edition
3	Wes McKinney	Python for Data Analysis: Data Wrangling with pandas, NumPy, and Jupyter	Grayscale Indian Edition	2022, 3 rd Edition
4	Alberto Boschetti, Luca Massaron	Python Data Science Essentials	Packt Publishing	2016, 2 nd Edition

Pedagogy: Lectures, Demonstration and Case Studies

Course Designers

1. Dr..K.Gandhimathi
2. Mrs.G.Anitha

Course Code	Course Name	Category	L	T	P	Credit
MDA2303	LINEAR ALGEBRA	Theory	58	2	-	4

Preamble

The course introduces the principles underlying linear equations and vector spaces. It also provides the concepts of Eigen values, Eigen vectors and Positive Definite Matrices in Scilab.

Course Learning Outcomes

Upon the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Demonstrate competence with the basic ideas of linear Algebra including the concepts of vector spaces, Determinants, Eigen values and Eigen vectors and positive definite matrices	K2
CLO2	The ability to understand the principles of Linear Algebra	K3
CLO3	Apply properties of linear spaces to specific mathematical structures	K4
CLO4	Compose clear and accurate proofs using the concepts of linear Algebra	K5
CLO5	Appreciate the significance of vector spaces and positive definite matrices	K6

Mapping with Programme Learning Outcomes

CLOs / PLOs	PLO1	PLO2	PLO3	PLO4
CLO1	S	S	S	S
CLO2	S	S	S	M
CLO3	S	S	S	S
CLO4	S	S	M	S
CLO5	S	S	S	S

S- Strong; M-Medium

Syllabus

UNIT I

(12 Hrs)

The Geometry of Linear Equations- An Example of Gaussian Elimination- Matrix Notation and Matrix Multiplication - **Triangular Factors and Row Exchanges**- Inverses and Transposes – Implementation of basic matrix operations(Sum, Multiplication, Square root, Cube, Inverse, Transpose, Rank, Fibonacci) in scilab

UNIT II

(11 Hrs)

Vector Spaces: **Vector Spaces and Subspaces** – Solving $Ax=0$ and $Ax=b$ - Linear Independence, Basis, and Dimension- The Four Fundamental Subspaces- **Graphs and Networks**- Linear Transformations, Implementation of vector space and subspace, Linear independency, to find the reduced row echelon form of a matrix in Scilab.

UNIT III

(11 Hrs)

Determinants: Introduction- **Properties of the Determinant**- Formulas for the Determinant- Applications of Determinants – Implementation of determinants, Properties - associative, commutative and distributive property in a matrix using Scilab

UNIT IV**(12 Hrs)**

Eigen values and Eigenvectors: Introduction- Diagonalization of a Matrix. - Difference Equations and Powers A^k - Differential Equations and e^{At} - **Complex Matrices- Similarity Transformations** – Implementation of Eigen values and eigenvectors, solving equations by Gauss elimination, Gauss Jordan Method and Gauss Siedel in Scilab

UNIT V**(12 Hrs)**

Positive Definite Matrices: Minima, Maxima, and Saddle Points - Tests for Positive Definiteness- **Singular Value Decomposition, Minimum Principles**, The Finite Element Method, Implementation of Minima, Maxima, Saddle Points and plot the function of the derivatives in Scilab

Text Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	Gilbert Strang	Linear Algebra and Its Application	Academic Press	2020, 4th Edition

Reference Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	David C. Lay, Steven R. Lay, Judi J. McDonald	Linear Algebra and Its Applications	Pearson Education	2016, 6 th Edition
2	Peter D. Lax	Linear Algebra and Its Applications	Wiley Publication	2014, 2 nd Edition

Pedagogy: Lectures, Demonstration and Case Studies

Course Designers

1. Dr. T.A.Albinaa
2. Dr. T.Brindha

Course Code	Course Name	Category	L	T	P	Credit
MDA2404	DATA STRUCTURES	Theory	58	2	-	4

Preamble

This course covers the various data structures, including arrays, structures, stacks and queues. It includes sorting and searching techniques and effective search methods in Binary trees. This course also deals with graph data structures.

Prerequisite

- Discrete mathematics.

Course Learning Outcomes

On successful completion of the course, the students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the concepts of arrays, strings and algorithms for basic operations.	K2
CLO2	Apply concept of stacks, queues, linked list and algorithms for basic operations.	K3
CLO3	Identify the familiarity with major algorithms and data structures	K4
CLO4	Analyze appropriate algorithms and data structures for various applications	K5
CLO5	Formulate the computational complexity of various algorithms	K6

Mapping with Programme Learning Outcomes

CLOs / PLOs	PLO1	PLO2	PLO3	PLO4
CLO1	S	S	S	S
CLO2	S	S	S	M
CLO3	S	S	S	S
CLO4	S	S	M	S
CLO5	S	S	S	S

S- Strong; M-Medium

Syllabus

UNIT I (12 Hrs)

Basics: Algorithm Specification – Data Abstraction – Performance Analysis: Time, Space Complexity – Arrays – Dynamic Allocated Arrays – Structures and Unions – Polynomials - **Sparse Matrices- Representation of Multidimensional Arrays – Strings.** Implementation of Arrays types, Structures, Unions and strings functions in python.

UNIT II (12 Hrs)

Stacks and Queues: Stacks – Stacks Using Dynamic Arrays - Queues - Circular Queues Using Dynamic Arrays - Evaluation of Expressions - **Multiple Stacks And Queues - Recursion. Linked Lists:** Singly Linked List And Chains – Representing Chains – Linked Stack And Queues – **Polynomials - Additional List Operations - Sparse Matrices – Doubly Linked List. List-Implementation of stack, queue, Linked Lists and Evaluation of Expressions using python.**

UNIT III (11 Hrs)

Searching: Introduction - Sequential Search - **Binary Search –Analysis. Sorting:** Introduction - Insertion Sort - Selection Sort - Merge Sort - **Quick Sort - Heaps and Heap Sort - Analysis.**

Implementation of Searching and sorting using python.

UNIT IV

(11 Hrs)

Efficient Binary Search Trees: Binary Tree – Traversals - Optimal Binary Search Trees – AVL Trees- **KD Trees.** Implementation of Binary Tree, Tree traversals using python.

UNIT V

(12 Hrs)

Graphs: The graph Abstract Data Type- Elementary graph operations- Minimum cost spanning trees- shortest paths and transitive closure- **AOV networks –AOE networks.**

Case Study using python: Location Identification, Game Development, Google Knowledge Graph, Path Optimization

Text Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	Benjamin Baka	Python Data Structures and Algorithms, Python Data Structures and Algorithms	Packt Publishing	2017, 1 st Edition
2	Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser	Data Structures and Algorithms in Python,	Wiley	2013. 1 st Edition

Reference Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	John Bullinaria	Data Structures and Algorithms	School of Computer Science University of Birmingham Birmingham, UK	2019
2	Dr. S.Nithyanantham, Ms.N.P. Shangara Narayanee	Data Structures and Algorithms (Python),	A.R.S. Publications	2021

Pedagogy: Lectures, Group Discussion, Case Study

Course Designers

1. Dr. N. Radha
2. Ms. M.Nandhini

Course Code	Course Name	Category	L	T	P	Credit
MDA2305	INFORMATION RETRIEVAL	Theory	58	2	-	4

Preamble

This course presents the concepts of document representation, document indexing, digital information storage, retrieval and distribution. It also introduces effective search strategies for IR systems, vector space model, text classification and evaluation methods of IR systems.

Prerequisite

- Statistics
- Basic Programming

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Demonstrate the concepts of document representation, document indexing, digital information storage, retrieval and distribution	K2
CLO2	Apply the concepts of vector spaces and classifiers to perform document classification.	K3
CLO3	Examine the advantages and disadvantages of different information retrieval models	K4
CLO4	Determine the effective search strategies for IR systems	K5
CLO5	Able to develop information retrieval system for specific use cases.	K6

Mapping with Programme Learning Outcomes

CLOs/ PLOs	PLO1	PLO2	PLO3	PLO4
CLO1	S	M	M	M
CLO2	S	M	M	M
CLO3	S	S	M	M
CLO4	S	M	S	M
CLO5	S	S	S	M

S- Strong, M-Medium

Syllabus

UNIT I

(12 Hrs)

Boolean retrieval: Information retrieval problem-Processing Boolean queries-Boolean model versus ranked retrieval. **The term vocabulary** and postings lists: Document delineation and character sequence decoding-Determining the vocabulary of terms-Faster postings list inter section via **skip pointers** -**Positional postings and phrase queries.**

UNIT II

(12 Hrs)

Dictionaries and tolerant retrieval: Search structures for dictionaries - **Wildcard queries** – Spelling correction-Phonetic correction. Index construction: Hardware basics- **Blocked sort-based indexing** - **Single-pass in-memory indexing** - Distributed indexing - Dynamic indexing - Other types of indexes.

UNIT III**(12 Hrs)**

Scoring, term weighting and the **vector space model**: Parametric and zone indexes-Term frequency and weighting - The vector space model for scoring. **Evaluation in information retrieval**: Information Retrieval system-Standard test Collection-Evaluation of unranked retrieval sets-**Evaluation of ranked retrieval results**- Assessing relevance

UNIT IV**(11 Hrs)**

XML retrieval: Basic XML concepts – A vector space model for XML retrieval – Evaluation of XML retrieval-Text-centric vs data-centric XML retrieval. **Text classification and NaiveBayes**: The text classification problem-Naïve Bayes text classification-Properties of Naïve Bayes-Feature selection-**Evaluation of text classification**

UNIT V**(11 Hrs)**

Vector space classification: Document representations and measures of relatedness in vector spaces- **Rocchio classification** -Flat clustering: Clustering in information retrieval -**Evaluation of clustering - K-means** – Web search basics - Web characteristics - Advertising as the economic model- Search user experience – Basic Page Rank

Text Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	Christopher D.Manning, Prabhakar Raghavan, HenrichSchutze	Introduction to Information Retrieval	Cambridge University Press, New York	2008, 1 st edition

Reference Books

S.No	Name of the Authors	Title of the Book	Publishers	Year & Edition
1	Stefan Buttcheret.al	Information Retrieval - Implementing and Evaluating	MIT Press	2016, 1 st Edition
2	Dr.Ricardo Baeza-Yateset.al	Modern Information Retrieval: The Concepts and Technology	Addison Wesley	2011, 1 st Edition
3	DavidA.Grossman and Ophir Frieder	Information Retrieval	Universities Press	2010. 2 nd Edition
4	G.G. Chowdhury	Introduction to Modern Information Retrieval	Facet Publishing	2017, 3 rd Edition

Pedagogy: Lectures, Demonstrations, Guest Lecture, Video Lectures

Course Designers

1. Dr.N.Radha
2. Mrs. G. Anitha

Course Code	Course Name	Category	L	T	P	Credits
MDA24P1	RDBMS LAB	Practical	-	-	75	3

Preamble

This course provides sound introduction to implement the relational database management systems concepts in SQL. This course also provides various exercises to implement the schema and Table creation, ER diagram, integrity constraints, Joins, Nested queries, functions, procedures, cursors, triggers, exception handling and to create Simple real time applications.

Prerequisite

- Database concepts
- Programming concepts

Course Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Implement the databases concepts and SQL queries as per user requirement	K2
CLO2	Apply specific SQL commands on relational tables for different situations	K3
CLO3	Analyse use cases and create constraints suitable for the given situation.	K4
CLO4	Create and analyse a database using SQL DML/DDDL commands	K6
CLO5	Design and build a GUI application	K6

Mapping with Programme Learning Outcomes

CLOs / PLOs	PLO1	PLO2	PLO3	PLO4
CLO1	S	S	S	S
CLO2	S	S	S	S
CLO3	S	S	S	S
CLO4	S	S	S	S
CLO5	S	S	S	S

S- Strong; M-Medium

Syllabus

- Exercises to create schema, Table, ER Diagram using online tool
- Exercises to implement the concepts of null constraint, unique constraint, integrity constraints, check constraints, default constraints.
- Exercises to implement nested queries.
- Exercises to implement the concepts of partitioning queries
- Exercises to create a view from the tables
- Exercises to create functions and procedures
- Exercise to create triggers and queries
- Exercises to create cursors and exceptions
- List of Projects using frontend and backend (Topics not limited to)
 1. Student Admission Management
 2. Student Mark List Generation

3. Students Grievance Management system
4. Library Management system
5. Payroll Management system
6. Placement Management system
7. Inventory Control Management system
8. Hospital Management system
9. Parlour Customer walk-in management system
10. Railway ticket reservation management system
11. Blood donation database management system
12. Cooking recipe portal creation
13. Electricity Bill payment system
14. Online tax calculator system
15. Web site creation for a Business
16. Vote ID card / Aadhaar card generation system
17. Online quiz management system
18. Training and placement alert system
19. Online gas booking and billing system
20. Online Banking services management system

Course Designers

1. Dr.N.Radha
2. Mrs.G.Anitha

Course Code	Course Name	Category	L	T	P	Credits
MDA23P2	FULL STACK DEVELOPMENT LAB	Practical	-	-	75	3

Preamble

This lab course is intended to explore concepts into full stack development through HTML, CSS, java script and Node.js. It makes the students to learn various designing approaches and techniques to provide a robust UI/UX experience using various software tools to implement web pages, style sheets, forms, events, server side applications.

Prerequisite

- Programming knowledge
- Client / Server concepts

Course Learning Outcomes

On the successful completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the web design elements, functions, files, data connections, forms, events.	K2
CLO2	Apply web design methods to solve problems	K3
CLO3	Analyze the web page design requirements and design web pages.	K4
CLO4	Create a web application using HTML,CSS, java script and Node.js.	K6
CLO5	Design and build web application using HTML,CSS, Java script and Node.js	K6

Mapping with Programme Learning Outcomes

CLOs/ PLOs	PLO1	PLO2	PLO3	PLO4
CLO1	S	S	S	S
CLO2	S	S	S	S
CLO3	S	S	S	S
CLO4	S	S	S	S
CLO5	S	S	S	S

S- Strong;M-Medium

LIST OF PROGRAMS

- Exercise to design a website with forms, frames, links and table using HTML tag.

- Exercise to build a countdown timer using HTML, CSS and JavaScript to display the remaining time until a specific event.
- Exercise to design a navigation menu with HTML unordered lists and CSS styles to create a dropdown or responsive menu.
- Exercise to design responsive web page that adjusts its layout and design based on the screen size using CSS media queries.
- Exercise to design a platform for embedding video from you tube using iframe.
- Exercise to design web server using built-in module in Node.js.
- Exercise to develop a HTML and CSS program to find the average and grade of students marks.
- Exercise to implement an image gallery using a grid layout and CSS to showcase a collection of image.
- Exercise to develop and demonstrate JavaScript with POP-UP boxes and functions.
- Exercise to build a CRUD operation for a product using laravel framework.

List of Projects using web technologies (Topics not limited to):

1. E-Commerce website
2. Social Media Platform
3. Online Learning Platform
4. Task Management Application
5. Weather Application
6. Event Booking Platform
7. Blogging Platform
8. Real-time Chat Application
9. Student feedback system
10. Online Resume Builder

Course Designers

1. Dr..K. Gandhimathi
2. Ms. N. Nandhini