



GAYATRI VIDYA PARISHAD COLLEGE FOR DEGREE AND PG COURSES(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc., Honours in Computer Science MINOR

w.e.f 2023-24 Admitted Batch

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	II	1	Problem Solving using C - (T)	3	3
			Problem Solving using C- (P)	2	
I I	III	2	Object Oriented Programming using Java- (T)	3	3
			Object Oriented Programming using Java- (P)	2	1
	IV	3	Database Management System	3	3
			Database Management System	2	1
		4	Object Oriented Software Engineering	3	3
			Object Oriented Software Engineering	2	1
		5	Web Applications Development using PHP & MYSQL	3	3
			Web Applications Development using PHP & MYSQL	2	1
		6	Internet of Things	3	3
			Internet of Things	2	1



GAYATRI VIDYA PARISHAD COLLEGE FOR DEGREE AND PG COURSES(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc., Honours in Computer Science MINOR COURSE

BLUE PRINT FOR MINOR SUBJECTS

SECTION-A			5X2=10
I	UNIT	MARKS	CO'S
1	UNIT-1	2	CO-1
2	UNIT-2	2	CO-2
3	UNIT-3	2	CO-3
4	UNIT-4	2	CO-4
5	UNIT-5	2	CO-5
II SECTION-B			
5X10=50			
6 A or B	UNIT-1	10	CO-1
7 A or B	UNIT-2	10	CO-2
8 A or B	UNIT-3	10	CO-3
9 A or B	UNIT-4	10	CO-4
10 A or B	UNIT-5	10	CO-5



GAYATRI VIDYA PARISHAD COLLEGE FOR DEGREE AND PG COURSES(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc., Honours in Computer Science MINOR(THEORY)

w.e.f 2023-24 Admitted Batch

SEME STER	COURSE	TITLE	CREDITS	HOUR S	MARKS
II	3	Problem Solving using C	3	4	100

Course Objective:

1. To explore basic knowledge on computers
2. Learn how to solve common types of computing problems.
3. Learn to map problems to programming features of C.
4. Learn to write good portable C programs.

Course Outcomes

Upon successful completion of the course, a student will be able to:

6. Understand the working of a digital computer and Fundamental constructs of Programming
7. Analyze and develop a solution to a given problem with suitable control structures
8. Apply the derived data types in program solutions
9. Use the 'C' language constructs in the right way
10. Apply the Dynamic Memory Management for effective memory utilization

UNIT-I

Introduction to computer and programming: Introduction, Basic block diagram and functions of various components of computer, Concepts of Hardware and software, Types of software, Compiler and interpreter, Concepts of Machine level, Assembly level and high-level programming, Flowcharts and Algorithms

Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Structure of C program, Input /output statements in C-Formatted and Unformatted I/O

UNIT-II

Control statements: Decision making statements: if, if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop. Jump Control statements: break, continue and goto.

UNIT-III

Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation.

Strings: Declaring & Initializing string variables; String handling functions, Character handling functions

UNIT-IV

Functions: Function Prototype, definition and calling. Return statement. Nesting of functions. Categories of functions. Recursion, Parameter Passing by address & by value. Local and Global variables. **Storage classes:** automatic, external, static and register.

Pointers: Pointer data type, Pointer declaration, initialization, accessing values using pointers. Pointer arithmetic. Pointers and arrays, pointers and functions.

UNIT-V

Dynamic Memory Management: Introduction, Functions-malloc, calloc, realloc, free
Structures:

Basics of structure, structure members, accessing structure members, nested structures, array of Structures, structure and functions, structures and pointers. **Unions** - Union definition; difference between Structures and Unions.

Text Books:

4. E. Balagurusamy, "Programming in ANSI C", Tata McGraw Hill, 6th Edn, ISBN-13: 978-1-25-90046-2
5. Herbert Schildt, —Complete Reference with C, Tata McGraw Hill, 4th Edn., ISBN-13:9780070411838, 2000
6. Computer fundamentals and programming in C, REEMA THAREJA, OXFORDUNIVERSITY PRESS

Reference Books

5. E Balagurusamy, COMPUTING FUNDAMENTALS & C PROGRAMMING – TataMcGraw-Hill, Second Reprint 2008, ISBN 978-0-07-066909-3.
6. Ashok N Kamthane, Programming with ANSI and Turbo C, Pearson Edition Publ, 2002.
7. Henry Mullish&Huubert L.Cooper: The Spirit of C An Introduction to modernProgramming, Jaico Pub. House,1996.
8. Y kanithkar, let us C BPB, 13th edition-2013, ISBN:978-8183331630,656 pages.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Quiz on computer hardware and software concepts

Evaluation Method: Objective-based quiz assessing knowledge and understanding

Unit 2: Activity: Problem-solving using Decision-Making Statements

Evaluation Method: Correctness of decision-making logic

Unit 3: Activity: Array and String Program Debugging

Evaluation Method: Identification and correction of errors in code

Unit 4: Activity: Pair Programming Exercise on Functions

Evaluation Method: Collaboration and Code Quality

Unit 5: Activity: Structured Programming Assignment

Evaluation Method: Appropriate use of structures and nested structures

II Semester
Course 3: Problem Solving using C(LAB)
Credits -1

List of Experiments

1. A. Write a program to calculate simple & compound interest
B. Write a C program to interchange two numbers.
 2. Find the biggest of three numbers using C.
 3. Write a c program to find the sum of individual digits of a positive integer.
 4. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
 5. Write a c program to check whether a number is Armstrong or not.
 6. Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
 7. Write a c program that implements searching of given item in given list
 8. Write a c program that uses functions to perform the following: Addition of two matrices. Multiplication of two matrices.
 9. Write a program for concatenation of two strings.
 10. Write a program for length of a string with and without String Handling functions
 11. Write a program to demonstrate Call by Value and Call by Reference mechanism
 12. Write a Program to find GCD of Two numbers using Recursion
 13. Write a c program to perform various operations using pointers.
 14. Write a c program to read data of 10 employees with a structure of 1.employee id 2. address no, 3.title, 4.joined date, 5.salary, 6.date of birth, 7.gender, 8.department.
 15. Write a Program to demonstrate dynamic arrays using Dynamic Memory Management function
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DEPARTMENT OF COMPUTER SCIENCE

B.Sc., Honours in Computer Science MINOR

w.e.f 2023-24 Admitted Batch

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	II	1	Introduction to Data Science and R Programming	3	3
			Introduction to Data Science and R Programming Practical Course	2	1
II	III	2	Python Programming for Data Analysis	3	3
			Python Programming for Data Analysis Practical Course	2	1
	IV	3	Data visualization using Tableau	3	3
			Data visualization using Tableau Practical Course	2	1
		4	Data visualization using python	3	3
			Data visualization using python Practical Course	2	1
III	V	5	Supervised Machine Learning with Python	3	3
			Supervised Machine Learning with Python Practical Course	2	1
		6	Unsupervised Machine Learning with Python	3	3
			Unsupervised Machine Learning with Python Practical Course	2	1



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B.Sc., Honors in Computer Science MINOR COURSE

BLUE PRINT FOR MINOR SUBJECTS

SECTION-A			
5X2=10			
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GAYATRI VIDYA PARISHAD COLLEGE FOR DEGREE AND PG COURSES(A)
DEPARTMENT OF COMPUTER SCIENCE
B.Sc., Honours in Computer Science
MINOR(THEORY)
INTRODUCTION TO DATA SCIENCE AND R PROGRAMMING

Syllabus w.e.f 2023-24 Admitted Batch

SEME STER	COURSE	TITLE	CREDIT S	HOURS	MARKS
II	1	INTRODUCTION TO DATA SCIENCE AND R PROGRAMMING	3	3	100

Aim and objectives of Course :

Data Science is a fast-growing interdisciplinary field, focusing on the analysis of data to extract knowledge and insight. This course will introduce students to the collection. Preparation, analysis, modeling and visualization of data, covering both conceptual and practical issues. Examples and case studies from diverse fields will be presented, and hands- on use of statistical and data manipulation software will be included.

Learning outcomes of Course:

Recognize the various discipline that contribute to a successful data science effort.

Understand the processes of data science identifying the problem to be solved, data collection, preparation, modeling, evaluation and visualization. Be aware of the challenges that arise in Data Sciences. Be able to identify the application of the type of algorithm based on the type of the problem.

Be comfortable using commercial and open source tools such as the R/Python language and its associated libraries for data analytics and Visualization.

UNIT I:

Defining Data Science and Big data, Benefits and Uses, facets of Data, Data Science Process. History and Overview of R, Getting Started with R, R Nuts and Bolts

UNIT II:

The Data Science Process: Overview of the Data Science Process-Setting the research goal, Retrieving Data, Data Preparation, Exploration, Modeling, data Presentation and Automation. Getting Data in and out of R, Using reader package, Interfaces to the outside world.

UNIT III:

Machine Learning: Understanding why data scientists use machine learning-What is machine learning and why we should care about, Applications of machine learning in data science, Where it is used in data science, The modeling process, Types of Machine Learning-Supervised and Unsupervised.

UNIT IV:

Handling large Data on a Single Computer: The problems we face when handling large data, General Techniques for handling large volumes of data, Generating programming tips for dealing with large datasets.

UNIT-V:

Sub setting R objects, Vectorised Operations, Managing Data Frames with the dplyr, Control structures, functions, Scoping rules of R, Coding Standards in R, Loop Functions, Debugging, Simulation. Case studies on preliminary data analysis.

TEXT BOOKS:

1. DavyCielen, Arno.D.B.Maysman, Mohamed Ali, “Introducing Data Science” ManningPublications, 2016.
2. Roger D. Peng, “R Programming for DataScience” Lean Publishing, 2015.

REFERENCE BOOKS:

1. Nina Zumel, John Mount, “Practical Data Science with R”, Manning Publications, 2014.
2. Tony Ojeda, Sean Patrick Murphy, Benjamin Bengfort, AbhijitDasgupta, “PracticalData Science Cookbook”, Packt Publishing Ltd., 2014.

Web References for case studies:

1. <https://www.kaggle.com/datasets>
 2. <https://github.com/>
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SEME STER	COURS E	TITLE	CREDIT S	HOURS	MARKS
II	1	INTRODUCTION TO DATA SCIENCE AND R PROGRAMMING LAB	1	2	100

Lab/Practical/Experiments/Tutorials syllabus:

1. Installing R and R studio, with proper notes on version management, cosmetic settings and different libraries.
2. Basic operations in r with arithmetic and statistics.
3. Getting data into R, Basic data manipulation, Loading Data into R
4. Basic plotting
5. Loops and functions
6. Create Vectors, Lists, Arrays, Matrices, Data frames and operations on them.
7. Demonstrate the visualization and graphics using visualization packages like ggplot2.
8. Implement Loop functions with lapply(), sapply(), tapply(), apply(), mapply().
9. Explore data using Single Variables: Unimodal, Bimodal, Histograms, Density Plots, Barcharts
10. Explore data using two Variables: Line plots, Scatter Plots, smoothing cures, Bar charts
11. Explore and implement commands using dplyr package
12. Download a dataset and work on basic data manipulation followed by inferential statistics.

RECOMMENDED TEXT BOOKS:

1. Mark Gardener, “Beginning R - The Statistical Programming Language”, John Wiley & Sons, Inc., 2012.
 2. W. N. Venables, D. M. Smith and the R Core Team, “An Introduction to R”, 2013.
Recommended Reference books:
 3. The art of R Programming: A tour of Statistical Software design. Norman Matloff. KindleEdition
 4. The book of R : The first course in Programming and Statistics by Tilman M. Davies.
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Recommended Co-curricular activities: (Co-curricular Activities should not promote copying from text book or from others' work and shall encourage self/independent and group learning)

A. Measurable:

1. Assignments on:
2. Student seminars (Individual presentation of papers) on topics relating to:
3. Quiz Programmes on:
4. Individual Field Studies/projects:
5. Group discussion on:
6. Group/Team Projects on:

B. General

1. Collection of news reports and maintaining a record of paper-cuttings relating to topics covered in syllabus
 2. Group Discussions on:
 3. Watching TV discussions and preparing summary points recording personal observations etc., under guidance from the Lecturers
 4. Any similar activities with imaginative thinking.
 5. Recommended Continuous Assessment methods:
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