COURSE PLAN

NAME OF THE DEPARTMENT: BCA/IT

NAME OF THE FACULTY: **Prof. PARTHA SARATHI CHATTARAJ**

ACADEMIC SESSION: **2023-24**

YEAR: **2024**

PROGRAMME: **BCA**

SEMESTER: **IV**

COURSE TYPE: **CORE**

COURSE NAME: **DESIGN AND ANALYSIS OF ALGORITHM**

COURSE CODE: **C8**

TOTAL CREDIT: **6**

PROGRAMME OUTCOMES (PO):

PO1: Scientific & Computational Knowledge: - Apply the information on scientific & computational ideas, software engineering and innovation basics.

PO2: Problem Analysis, Design & Implementation: - Identify, formulate and analyze real world problem. Design solution for Software, Hardware & Networking problems and implementation using Software & Network tools.

PO3: Modern tool usage: - Ability to select modern computing tools, skills and techniques necessary for innovative software solutions.

PO4: Project Management: -Comprehend Software Engineering and Technology standards and apply these to prepare own project and system as a part and pioneer in a group.

PO5: Career Development & Entrepreneurship: Classify opportunities, private enterprise dream and use of original thoughts to build worth and means for the betterment of the human being and the world.

PO6: Communication: Communicate effectively on computational & information Technology activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO7: Ethics: Ability to apply and commit professional Ethics, cyber regulations & control on software piracy in a global economic environment.

PO8: Preparing students for future aspects: Building and improving their creativity, social awareness, and general knowledge.

PO9: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSO):

PSO1: An ability to apply technical comprehension in varied areas of Computer Applications and experience a conducive environment in cultivating skills for thriving career and higher studies.
PSO2: Understand the concept of Programing logic, Web designing logic, Signal processing, Image processing, Mobile Applications, Multimedia Media.

PSO3: Develop competencies in various disciplines of technologies such as Server-side Web applications, computer networking, software engineering, database concepts and programming

A. COURSE OUTCOMES (COs):

CO1: Learn basic Design and apply analysis techniques of Algorithms.

CO2: Implement iterative techniques, Divide and Conquer, Dynamic Programming, and Greedy Algorithms.

CO3: Understand and apply elementary sorting techniques likes Bubble Sort, Insertion Sort, Merge Sort, and Advanced Sorting techniques like Heap Sort, Quick Sort, Bucket Sort, Radix Sort and Count Sort, and also learn Searching Techniques, Medians & Order Statistics, complexity analysis;

CO4: Create Decision Trees and learn how to take decision onto the tree

CO5: Understand Red-Black Trees and learn how to implement Red-Black Trees

CO6: Learn Amortized analysis and how to use sequence of operations through this amortized analysis.

CO7: Learn Graph and explain how to create algorithms like Breadth First Search, Depth First Search and its Applications, and also Minimum Spanning Trees.

COURSE TEACHING AND LEARNING ACTIVITIES

A. PEDAGOGY
i.	**Whiteboard**	√
ii.	**Flipped Class**	√
iii.	**PPT**	√

B. COURSE COMPLETION PLAN

UNIT	NO. OF LECTURES		TEST	QUIZ	ASSIGNMENT
	THEORY	PRACTICAL/TUTORIAL			
1	3	7	√		√
2	6	14	√		√
3	20	25	√		√
4	4	6	√		√
5	6	9	√		√
6	4	6	√		√
7	4	6	√		√

B. COURSE DELIVERY PLAN:

UNIT	TOPIC/SUBTOPIC	LECTURE REQUIRED	CO ADDRESSED	ASSIGNMENT/TEST/QUIZ

		(Theory & Practical)		
1	Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm.	10	CO1	√
2	Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms.	20	CO2,CO3	√
3	Elementary sorting techniques–Bubble Sort, Insertion Sort, Merge Sort, Advanced Sorting techniques - Heap Sort, Quick Sort, Sorting in Linear Time - Bucket Sort, Radix Sort and Count Sort, Searching Techniques, Medians & Order Statistics, complexity analysis;	45	CO3	√
4	Decision Trees	10	CO4	√
5	Red-Black Trees	15	CO5	√
6	Amortized analysis	10	CO6	√
7	Graph Algorithms–Breadth First Search, Depth First Search and its Applications, Minimum Spanning Trees.	10	CO7	√

C. COURSE OUTCOME ASSESSMENT PLAN
a. DIRECT ASSESSMENT

(Please tick the appropriate column)

COURSE OUTCOME	ASSESSMENT				REMARKS
	QUIZ	TEST	MID SEMESTER	END SEMESTER	
CO1		√	√	√	
CO2		√	√	√	
CO3		√	√	√	
CO4		√	√	√	
CO5		√	√	√	
CO6		√	√	√	
CO7		√	√	√	

b. INDIRECT ASSESSMENT (STUDENT SURVEY)

Rate the following aspects of course outcomes. Use the scale 1-3

S. No	Course Outcome	1	2	3
1.	CO1	√		
2.	CO2		√	
3.	CO3			√
4.	CO4	√		
5.	CO5	√		
6.	CO6		√	
7	CO7		√	

1. Average
2. Good
3. Very Good

D. SUGGESTED READINGS

a. TEXT BOOKS

T.H. Cormen Computer Algorithm – Introduction to Design and Analysis

b. REFERENCE BOOKS

T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest

c. VIDEO RESOURCE

    i. https://youtu.be/eIw9hePi4A0

    ii. https://youtu.be/u8JZ9gU5o4g?list=PLxCzCOWd7aiHcmS4i14bI0VrMbZTUvlTa

d. WEB RESOURCES

    i. https://www.javatpoint.com/daa-tutorial

    ii. https://www.guru99.com/design-analysis-algorithms-tutorial.html

e. E-RESOURCES

    i. Tutorial Point, Java Point etc.