CMR INSTITUTE OF TECHNOLOGY

ACADEMIC YEAR 2025-26

FLIPPED CLASSROOM REPORT

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

Subject code	**BCS401**	**Course Name**	**Analysis & Design of Algorithm**
Semester / Section	**4th semester/B**	**Prepared By**	**Dinesh Kumaar R**
Curriculum Gap Identified:	The current pedagogy for the Analysis & Design of Algorithms (BCS401) course is predominantly lecture-driven, which restricts student participation and limits deep engagement with algorithmic concepts. Core topics such as asymptotic analysis, divide-and-conquer, dynamic programming, and graph algorithms are introduced with insufficient scaffolding, making it difficult for students to intuitively understand problem-solving strategies and complexity analysis. While the syllabus emphasizes theoretical understanding and classical algorithms, it does not consistently incorporate real-world applications or practical scenarios that highlight the relevance of these techniques in modern computing. Additionally, assessment methods are largely individual and theory-focused, providing limited opportunities for collaborative learning, coding practice, and peer-based problem solving. This creates a gap in developing critical skills such as algorithm design thinking, optimization, and teamwork, which are essential for both industry readiness and competitive programming.		

Summary of Flipped Classes conducted:

Sl No.	Topic	Date	Flipped class / Video Session (Choose from dropdown)	Total number of students
1	Sorting by Counting: Comparison counting sort	11-3-2026	Demonstration Focused FP	63
2	Balanced Search Trees	21-4-2026	Flipping the Teacher	55
3	N-Queens Problem	18-5-2026	Demonstration Focused FP	48

Detailed Report

1	**Sorting by Counting: Comparison counting sort**	**11/03/26**	**Demonstration Focused FP**	**63**

Materials Shared Before class

https://www.geeksforgeeks.org/dsa/selection-sort-vs-bubble-sort/

Conduction of Flipped Classroom

The student Emani Sai Shanmukha Srinivas (USN: 1CR24IS069) has taken the class on the sorting. He explained the code and logic for selection sort and bubble sort. He explained the mathematical analysis of those sorting. A comparative study was done between selection sort and bubble sort.

Evaluation :

All the other students were able to understand the concept they have been given sample list to try both the sorting.

Outcome:

- Following PO's are addressed here: PO1,PO2, PO3, PO4, PO9,PO10,PO11,PO12
- Following PSO's are addressed here: PSO1 and PSO2

2	**Balanced Search Trees**	**21/04/26**	**Flipping the Teacher**	**55**

Materials Shared Before class

https://ds2-iiith.vlabs.ac.in/exp/2-3-tree/operations/TwoThreeTreeDemo.html

Conduction of Flipped Classroom

A demonstration class has taken on balanced search trees. The student Ishaan Nayak (USN: 1CR23IS067) has explained the balancing and construction of 2-3 Trees. He also demonstrated the construction of a 2-3 Tree. The example workout on a question from the VTU question paper was also discussed and the demonstration was also shown.

Evaluation :

All the other students were able to understand the concept and a new problem was given to them to solve. All the students were able to construct the 2-3 tree.

Outcome:

- Following PO's are addressed here: PO1,PO2, PO3, PO4, PO9,PO10,PO11,PO12
- Following PSO's are addressed here: PSO1 and PSO2

3	N-Queens Problem	18-5-2026	Demonstration Focused FP	48

Materials Shared Before class

https://n-queen-five.vercel.app/
https://www.cs.usfca.edu/~galles/visualization/RecQueens.html
https://www.brainbashers.com/queens.asp

Conduction of Flipped Classroom

A demonstration class was taken on the n-queens problem. The explanation and demonstration on the code and logic for the n-queens problem was given. Then the explanation of the backtracking analysis of the problem was given. A comparative study on different n values was discussed.

Evaluation :

All the other students were able to understand the concept and they have been given different n values to solve the problem

Outcome:

- Following PO's are addressed here: PO1,PO2, PO3, PO4, PO9,PO10,PO11,PO12
- Following PSO's are addressed here: PSO1 and PSO2