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/A**	**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	10-3-2026	Demonstration Focused FP	53
2	Balanced Search Trees	21-4-2026	Flipping the Teacher	55
3	N-Queens Problem	18-5-2026	Demonstration Focused FP	41

Detailed Report

1	**Sorting by Counting: Comparison counting sort**	**10/03/26**	**Demonstration Focused FP**	**53**

Materials Shared Before class

https://ds1-iiith.vlabs.ac.in/exp/bubble-sort/bubble-sort/bsdemo.html

Conduction of Flipped Classroom

A demonstration class was taken on sorting. The explanation and demonstration on the code and logic for selection sort and bubble sort was given. Then the explanation of the mathematical analysis of those sorting algorithms was given. A comparative study was done between selection sort and bubble sort.

Evaluation :

All the other students were able to understand the concept and they have been given a 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**	**Demonstration Focused FP**	**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 Divyam Kishor Paswan (USN: 1CR24IS065) 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	41

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