
SYLLABUS FOR BOARD OF STUDIES ADOPTION — generated from the live catalogue record

Data Structures and Algorithms for Placements

S-01A · 5 days (configurable 1–5 days) · Informatics · Software Engineering · Years: 3rd, PG

CONTENTS

1. Overview	2
2. Hours and credit position	2
3. Course outcomes	2
4. Course content — modules	2
5. Assessment scheme (100 marks)	3
6. CO–PO mapping	3
7. Every participant receives	3
8. Fee	3
9. Designed by	3

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OVERVIEW

Arrays through graphs, complexity analysis, and 100 solved interview problems with a tracked progress score. Data structures and algorithms decide almost every technical interview; a cohort that has solved and defended tracked problems walks into placements measurably ahead.

HOURS AND CREDIT POSITION

Contact hours: 40 Guided project: 20 Self-study: 0 Notional total: 60

Credit claim: 2

60 notional hours ÷ 30 hours per credit (NSQF track, UGC Micro-credentials Guidelines §5.3.3) = 2 credits.

COURSE OUTCOMES

- CO1. Analyse the time and space complexity of an algorithm using Big-O notation (K4)
- CO2. Implement the core data structures — lists, stacks, queues, trees, heaps and graphs (K3)
- CO3. Apply recursion, backtracking and dynamic programming to unfamiliar problems (K3)
- CO4. Select an appropriate algorithmic strategy for a stated problem constraint (K4)
- CO5. Solve and defend tracked interview problems under timed conditions (K3)

COURSE CONTENT — MODULES

Hours shown are the recommended format; module time scales proportionally when the engagement runs 1–5 days.

Module 1 — Complexity analysis and arrays (5h recommended)

Theory: Big-O, time and space cost, arrays, two-pointer, sliding window

Lab: Solve and time array problems, plotting measured growth

Output: Complexity worksheet + solved set

Module 2 — Strings and hashing (5h recommended)

Theory: Pattern matching, frequency maps, prefix techniques

Lab: String and hashing problem drills

Output: Solved string problem set

Module 3 — Linked lists, stacks and queues (5h recommended)

Theory: Pointer manipulation, monotonic stacks, queue patterns

Lab: Implement each structure from scratch, then apply it

Output: Structure library

Module 4 — Recursion and backtracking (5h recommended)

Theory: Recursion, subsets, permutations, pruning

Lab: Backtracking problem drills

Output: Solved backtracking set

Module 5 — Trees and binary search trees (5h recommended)

Theory: Traversals, balancing, lowest common ancestor

Lab: Tree construction and traversal problems

Output: Solved tree set

Module 6 — Heaps and greedy (5h recommended)

Theory: Priority queues, interval scheduling, greedy proofs

Lab: Greedy and heap problem drills

Output: Solved greedy set

Module 7 — Graphs (5h recommended)

Theory: Representations, BFS, DFS, shortest paths, topological sort

Lab: Graph traversal and path problems

Output: Solved graph set

Module 8 — Dynamic programming and mock interviews (5h recommended)

Theory: One- and two-dimensional DP, live interview simulation

Lab: DP drills then a timed mock interview

Output: Solved DP set + interview feedback

ASSESSMENT SCHEME (100 MARKS)

Tracked problem set (progress score) — 40 marks

Timed mock tests — 40 marks

Mock technical interview — 20 marks

CO-PO MAPPING

CO1 !' PO2 (strength 2)

Complexity analysis is the core of problem analysis.

CO2 !' PO1 (strength 2)

Data structures are the foundational knowledge every solution rests on.

CO3 !' PO3 (strength 2)

Algorithmic strategy is solution design applied to new problems.

CO4 !' PO2 (strength 2)

Choosing a strategy for a constraint is analytical judgement.

CO5 !' PO10 (strength 2)

Defending a solution aloud is technical communication under pressure.

EVERY PARTICIPANT RECEIVES

- Certificate of completion
- Course material
- LMS access
- Interview question bank
- Mock interview & viva practice
- Optional nasscom NSQF assessment (priced per candidate on your quotation)

FEE

13,200 per student, incl. GST

Excludes the optional nasscom assessment where offered. Final pricing on your college's quotation.

DESIGNED BY

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