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

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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

¹1,500 per student, incl. GST
Excludes the optional nasscom assessment where offered. Final pricing on your college's quotation.

DESIGNED BY

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