

Data Structures and Algorithms - Course Study Sheet

Course: Data Structures and Algorithms Cluster: Computing and Data

Studies arrays, linked structures, stacks, queues, trees, graphs, hashing, sorting, and complexity.

Five-module course map

Module	Active evidence to produce
1. abstract data types	Explain the central idea, complete an application, diagnose one plausible error, and connect it to the next module.
2. trees and graphs	Explain the central idea, complete an application, diagnose one plausible error, and connect it to the next module.
3. hash tables	Explain the central idea, complete an application, diagnose one plausible error, and connect it to the next module.
4. sorting and searching	Explain the central idea, complete an application, diagnose one plausible error, and connect it to the next module.
5. asymptotic analysis	Explain the central idea, complete an application, diagnose one plausible error, and connect it to the next module.

Reliable learning method

define required operations, select a representation, state invariants, analyze cost, implement, and test adversarial cases

Representative application

Compare two data structures for a workload and justify the choice with operation frequency, complexity, and measured behavior.

Weekly study cycle

1. Preview the objective and write two questions. 2. Attend or engage and capture decisions rather than every sentence. 3. Reconstruct the main idea within 24 hours. 4. Complete independent practice. 5. Analyze the first unsupported move on each error. 6. Use feedback. 7. Schedule a delayed mixed recheck.

Self-check before moving on

Can you explain the idea without notes, complete a fresh task, detect a near-miss, verify the result, and state a limitation? Watch especially for: memorizing Big-O labels without specifying input size, operation, average or worst case, and implementation assumptions.

What to save

an implementation and analysis with invariants, complexity, benchmarks, and edge tests

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