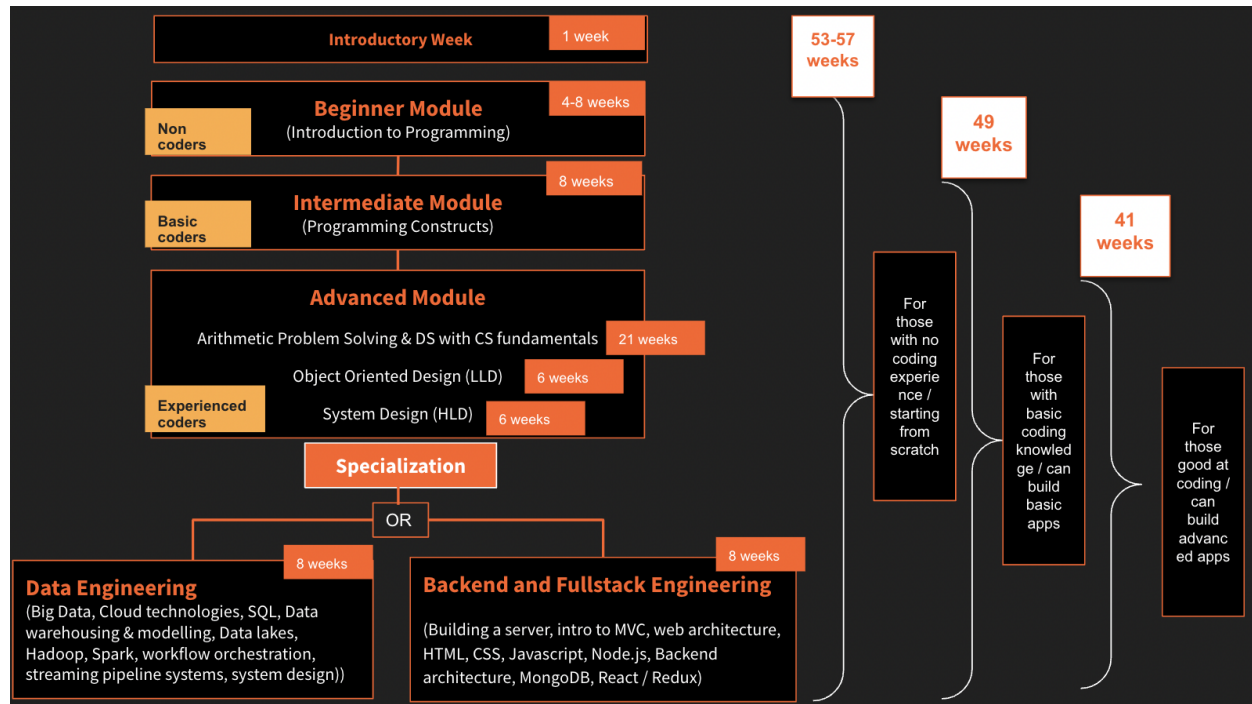


Academy New Curriculum



New Curriculum Outline

Introduction to Programming (Start point for Beginner Batch) - 4-8 weeks

- Python OR Java
- Data Types and Operators
- Loops and Conditional Statements
- Functions
- 1D & 2D Arrays
- Strings

Programming Constructs (Start point for Intermediate Batch) - 8 weeks

- Time Complexity Analysis
- Arrays
- Number System, Bit Manipulation
- Maths for Programming
- Sorting and Hashing
- Recursion
- Data Structures Fundamentals (Stacks, Linked Lists, Trees)

Advanced Problem Solving & Data Structures with CS Fundamentals (Start Point for Advanced Batch) - **21 weeks**

- Problem Solving Techniques
 - Time Complexity Analysis
 - Arrays
 - Bit Manipulation
 - Maths
 - Recursion & Sorting
 - Binary Search & 2 Pointers
 - Hashing
 - Pattern Matching Algorithms
- Data Structures
 - Linked Lists
 - Stacks & Queues
 - Trees
 - Tries & Heaps
- Advanced Problem Solving Techniques
 - Greedy Algorithms
 - Backtracking
 - Dynamic Programming
 - Graphs
- CS Fundamentals
 - DBMS
 - OS
 - Computer Networks

Object Oriented Design (LLD) - **6 weeks**

- OOP
- Design Principles - SOLID
- Design Patterns
- UML Diagrams & Schema Design
- Best Programming Practices (API Design and Project Structure)
- Concurrency and Multithreading
- Case Studies and Machine Coding (How to build real systems)

System Design (HLD) - **6 weeks**

- Consistent Hashing
- Caching
- CAP Theorem
- Distributed Systems & Databases
- SQL and NoSQL
- Scalability

- Zookeeper + Kafka
- Location Based Services (S3, Quad Trees)
- Microservices & Containerisation (Docker)
- Case Studies

Specialisations (Only 1 Specialisation allowed per learner, Recorded lectures for other available on 'Request from Support')

Backend and Fullstack - 8 weeks

- MVC
- REST APIs
- ORM
- SpringBoot (or Django)
- Views
- Building a server
- Web architecture
- HTML, CSS, Javascript, Node.js
- Backend architecture, MongoDB, React / Redux
- Github, Version Control
- Capstone project

Data Engineering - 8 weeks

- Building efficient Data Processing Systems
- Advanced SQL
- Cloud Services - AWS, or GCP
- Developing ETL pipelines
- Map-Reduce Framework
- Big Data
- Data Warehousing & Modelling
- OLAP, Dashboarding
- Workflow Orchestration
- Logging, and Monitoring
- 3 Projects

New Curriculum Deep-dive

Introduction to Programming (Start point for Beginner Batch) - **4-8 weeks**

Programming Fundamentals, Java Or Python	1-2 Weeks
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Data Types and Operators, Loops, Conditional Statements	1-2 Weeks
Function, Methods, Recursion basics, Maths	1-2 Weeks
Arrays - 1D and 2D, Strings	1-2 Weeks

Programming Constructs (Start point for Intermediate Batch) - **8 weeks**

Introduction to Problem Solving and Time complexity	1 Week
Array Techniques (prefix sum, carry forward, subarrays, 2D matrices)	2 Weeks
Bit Manipulations	1 Week
Maths, Sorting, Hashing	2 Weeks
Recursions and Data structure fundamentals - Stacks, Linked Lists, Trees	2 Weeks

Advanced Problem Solving & Data Structures with CS Fundamentals (Start Point for Advanced Batch) - **21 weeks**

Time complexity analysis, Arrays, Bit manipulation, Maths	3 Weeks
Recursion, Sorting, Binary Search, Two Pointers, Hashing, Pattern Matching Algorithms	4 Weeks
Linked Lists, Stacks, Queues, Deque	3 Weeks
Trees, Binary Search Trees, Tries, Heaps	3 weeks
Greedy Algorithms, Backtracking, Dynamic Programming, Graphs	4 Weeks
DBMS, OS, Computer Networks	4 Weeks

Object Oriented Design (LLD) - **6 weeks**

OOP, Terminology, SOLID Principles	1 Week
Design Patterns (creational, structural, behavioural), UML Diagrams and Schema Design	2 Weeks
LLD Problems, Design, Machine coding, Case Studies	3 Weeks

System Design (HLD) - **6 weeks**

HLD Basics, Consistent Hashing, Caching, CAP Theorem, Master-Slave	1 Week
Distributed Systems, Databases, SQL and NoSQL	1 Week
Zookeeper + Kafka, S3 + Quad Trees, Microservices, Containerisation, Case Studies	4 Weeks

Specialisations (**Only 1 Specialisation**)

Backend and Fullstack - **8 weeks**

MVC, REST APIs, ORM, SpringBoot, Views, Database	3 Weeks
Building a server, Web architecture, HTML, CSS, Javascript, Node.js, Backend architecture, MongoDB, React / Redux	4 Weeks
Project Deployment	1 Week

OR

Data Engineering - **8 weeks**

Advanced SQL, filtering, subqueries, aggregation functions, advanced constructs and structures	2 Weeks
Data Warehousing & Modelling, Data Lakes, OLAP, Data Processing - Big Data Hadoop & Spark	3 Week
Batch and Streaming - ETL pipelines, Workflow Orchestration, OLTP to OLAP systems, Distributed systems, Cloud Tech	2 Week
Project Deployment	1 Week