



Ready to stop **STUDYING** 
and start **PERFORMING?**
 

kodprep



**Market-Aligned
Mastery**



Elite Mentorship



**The "Real
World" Edge**



**Guaranteed
Internship
Experience**

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Infosys

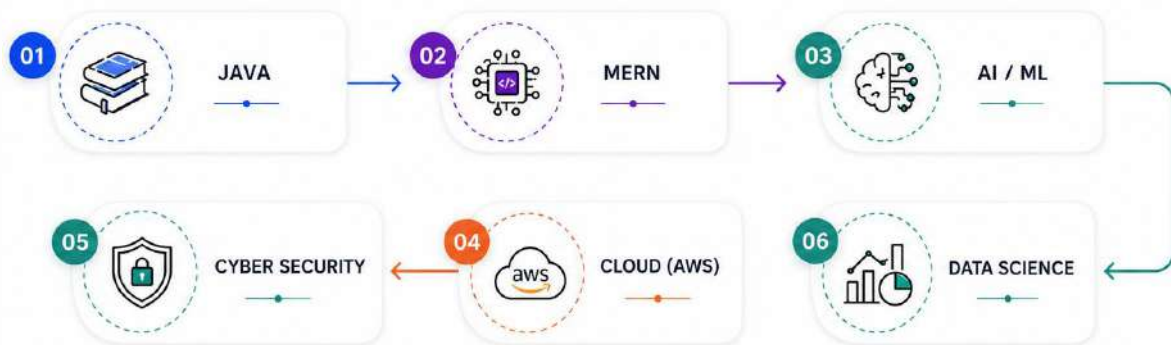


Microsoft

Deloitte.

DIRECT MENTORSHIP FROM VETERANS

Course Roadmap



PROJECT LIFECYCLE DIAGRAM



Semester 1 – foundation & programming

C programming: algorithms, control flow, arrays, functions, recursion, pointers, file handling
Engineering Mathematics-I (sequences, integral & multivariable calculus)
Engineering Physics (quantitative reasoning, experiments)
Engineering Graphics & Design – CAD from day one



Practical / Lab Work:

~100 easy C problems on KodPrep auto judge (copilot-free)
PPS Lab viva: live judge problem-solving
CAD drawings portfolio – 5-8 models
Physics lab with digital data-analysis sheet



Assignments:

~100 easy C problems (topic-wise ladders)
Tutorial problem sets (Maths-I)
5-8 CAD model portfolio
AI-awareness reflection note (BMPD)



Mini Project:

2-3 standalone C programs: calculator, student-record system, file-I/O grade tracker



Major Project:

First modular C application – file handling, input validation, edge-case tested, documented



Certifications (Global + Institute issued):

KodPrep Builder Baseline Certificate
AI Awareness Primer Badge (BMPD)
Institute: PPS & Computational Foundations



Semester 2 – core engineering & web systems

Data Structures Foundations
(KodPrep spine): arrays, stacks, queues, linked lists
Engineering Mathematics-II
(linear algebra, ODEs – ML backbone framing)
Chemistry-I (measurement reasoning & quantitative analysis)
AI-Augmented Engineering Part 1: LLMs, prompt engineering, verification discipline, ethics



Practical / Lab Work:

DS problem ladder (~40 problems) on auto-judge
AI verification labs: read-explain-then-fix AI code
Prompt & verify logbook (10+documented sessions)
Circuit simulation vs measured-result comparison (BEE)



Assignments:

40+ DS problems: arrays → stacks → queues → linked lists
Matrix-solver script (Maths II tie-in)
AI prompt & verification logbook
First coding contest entry on KodPrep



Mini Project:

Small AI-assisted CLI build (quiz app / expense tracker)
— fully understood, zero black-box code



Major Project:

Role-based system (library / hostel mgmt) using DS —arrays, linked-list & stack usage in real logic



Certifications (Global + Institute issued):

AI-Augmented Engineering Part 1 Certificate
KodPrep Builder Gate Badge
Institute: Programming & Computational Foundations



Semester 3 – backend & specialization development

Algorithms & Advanced DS: trees (BST/AVL/B/B+), sorting, hashing, graph algorithms
 OOP in C++/Java: classes, inheritance, polymorphism, exception handling
 Mathematics-III – Probability & Statistics (ML gateway)
 IT Workshop: Git & branching, Linux CLI, reproducible dev environment



Practical / Lab Work:

Algorithm–design problem ladders: easy → medium (60+problems)
 OOP design challenges auto-checked on platform
 Git workflow + Linux terminal labs on real repos
 Statistical notebook: real dataset → stats → first regression



Assignments:

60+ DSA problems (topic-wise + timed contests)
 Complexity analysis log (Big-O per topic)
 OOP class-modelling design exercises
 First batch-level contest entry



Mini Project:

OOP mini-project: console library / banking system with class hierarchy, exceptions & file persistence



Major Project:

First ML notebook — linear regression / Naive Bayes on real dataset with interpreted write-up



Certifications (Global + Institute issued):

KodPrep DSA Foundations Certificate
 Developer Tooling (Git/Linux) Badge
 Institute: OOP & Engineering Tools Certificate



Semester 4 – full stack & cloud integration

Theory Topics:

Design & Analysis of Algorithms: greedy, D&C, DP, backtracking, graph algorithms, P/NP

Operating Systems: processes, threads, scheduling, IPC, deadlocks, memory, file systems

Discrete Mathematics: logic, counting, induction, graph theory

Computer Organisation & Architecture: ISA, pipelining, cache hierarchy



Practical / Lab Work:

Paradigm-tagged problem ladders (greedy / DP / backtracking)

Mini-shell in C: fork(), exec(), pipes, redirection, signals

Scheduling & producer-consumer sync implementations

Assembly program + cache-behaviour experiment

Assignments:

Medium-tier DAA problems + first proctored timed contests
OS systems programming labs on auto-judge

Discrete Math proof & counting set Problem-Solver Gate assessment (tier $\geq$ C required)



Mini Project:

Working mini-shell with fork/exec/pipes/redirection – handles basic shell grammar and signals

Major Project:

Scheduler or producer-consumer implementation + DSA portfolio at Medium fluency + contest history



Certifications (Global + Institute issued):

KodPrep Problem-Solver Gate Badge (Tier $\geq$ C)
Institute: Systems Programming Level-1
KodPrep Contest Participation Record



Semester 5 – scalable enterprise systems

Database Management Systems: ER modelling, SQL, normalisation, ACID, indexing, security
Computer Networks: OSI/TCP-IP stack, sockets, transport & application layers
Software Engineering: Agile/Scrum, SDLC, UML, testing, CI/CD
Elective-I Track Course (Web Tech / Python / Computer Graphics per track)



Practical / Lab Work:

SQL problem sets graded against live Postgres schemas
Socket client server over TCP/UDP + Wireshark packet analysis
Agile sprint board + code review + CI on Track Project
Pt. 1 DFA/NFA simulator construction lab



Assignments:

SQL optimisation tasks on normalised schemas
Socket programming: echo server & file transfer (TCP/UDP)
Agile sprint deliverables (backlog, standup notes, demo)
ERP process map & integration report



Mini Project:

Working TCP/UDP client-server program + traffic-analysis write-up + DFA/NFA simulator



Major Project:

Track Project Part 1 — first shippable slice (Full-Stack / Data&ML / AI-GenAI / Cloud-DevOps)



Certifications (Global + Institute issued):

KodPrep Pre-Internship Gate Badge
SQL Track Certificate (Level 1)
Institute: Software Engineering Foundations



Semester 6 – professional & placement accelerator

AI-Augmented Engineering Part 2: LLM APIs, RAG, embeddings, agentic workflows, AI-assisted testing
Artificial Intelligence & Lab search, A*, probabilistic reasoning, Bayesian nets, RL/MDP
Compiler Design: lexical analysis, parsing, intermediate code generation
Elective-II & III (Cloud/IoT/DIP + ML/Data Science/Mobile) – Project-I milestone



Practical / Lab Work:

LLM API + RAG/embeddings feature wired into track project
AI-assisted code review with eval rubrics (hallucination checks)
A* pathfinding & agent implementation lab
Staged lexer → parser → IR milestones auto-tested



Assignments:

AI-powered feature shipped into track project
AI output evaluation report (quality metrics)
Advanced track-project features (Elective-II & III)
Working lexer + parser for a defined grammar



Mini Project:

Working lexer + parser (with simple IR) for a mini-language – all staged milestone tests green



Major Project:

Shipped, demo-ready track project (Project-I):
AI-featured, cloud-deployed, CI-reviewed, live demo



Certifications (Global + Institute issued):

AI-Augmented Engineering Part 2 Certificate
Track Project Completion Badge
KodPrep Engineer Gate Badge



SEMESTER 7 – JOB-READY PROFESSIONAL: CAPSTONE



Network Security & Cryptography
: AES/RSA, key exchange, TLS, firewalls, threat modelling
Data Mining & Warehousing: association rules, classification, clustering, recommenders
Elective-IV (Deep Learning / CV / Distributed DBs) + Elective-V (Blockchain / Parallel / Quantum)
Open Elective-II: Placement Readiness — company-aligned CODE, mock OAs, full mock-interview cycles



Practical / Lab Work:

Crypto implementation challenges (AES/RSA from spec, toy-cipher break)
Recommender/classifier notebook with precision/recall/lift write-up
Proctored mock OAs — timed, company-specific, recorded
Full mock interview cycles: DSA + System Design + HR panel

Assignments:



Hard DSA + company-specific sets (Tier A/B coverage)
Security hardening audit on own capstone (TLS, auth, threat model)
Recommender evaluation write-up + DM portfolio
Job-Ready Gate assessment: Tier A/B required to pass



Mini Project:

Crypto library (AES/RSA) + security hardening report on capstone with documented threat model

Major Project:



Capstone (Project-II): production-grade deployed product — real users, CI/CD, monitoring, system-design doc



Certifications (Global + Institute issued):

KodPrep Job-Ready Gate Badge (Tier A/B)
Mock Interview Clearance Certificate
Institute: Capstone Completion + Track Specialisation

SEMESTER 8 – INDUSTRY INTERNSHIP & PLACEMENT

Live DSA refreshers targeted to each company (gap-closing problem sets)

System design rounds:
chat app, URL shortener, e-commerce scale. HR & offer coaching:
negotiation, joining prep, professional conduct
Agent / LLM-app patterns applied in production internship context



Practical / Lab Work:

Live coding interview simulations (timed, recorded, mentor-reviewed)
Company-tailored system-design mock rounds
HR mock sessions + offer negotiation coaching
Weekly mentor check-ins: progress log, offer pipeline review



Assignments:

Gap-closing targeted problem sets per company pipeline
Portfolio polish: GitHub, LinkedIn headline, resume v3
Internship weekly deliverable logs (platform-submitted)
Final readiness score + placement outcomes tracker



Mini Project:

Weekly progress log + mentor evaluation reports across full internship tenure



Major Project:

Real industry internship: production work, signed mentor evaluation, offer conversion / placement outcome



Certifications (Global + Institute issued):

KodPrep Placement Certificate
Final Portfolio & Readiness Report (8-semester)
Offer Conversion / Placement Outcome Badge
Institute: B.Tech CSE Degree



Java Full Stack | MERN | AI/ML | Data Science | Cloud (AWS) | Cyber Security

Agenda / Timetable (5 days a week)

Lecture & Exercise		Capstone Project	
Time	4 months	Time	1 months
3 hours	Lecture (30%) + Practice (70%)	3 hours	Project
1 hours	Lunch Break	1 hours	Break
3 hours	Lecture (30%) + Training (70%)	3 hours	Project

Assessment

Criteria	Proportion
Quiz and test - Quiz will be placed at the end of each chapter (20%) - Test will be placed on the last day of the course (20%)	40 %
Capstone Project - Project measured based on the quality of final product, presentation and teamwork	60 %
Participation - Participation measured by the instructor throughout the course	+a
Total	100%



Certification

Qualification	Cut-off Rate
1. Attendance higher than	90 %
2. Total grade for assessment higher than	50 %
Certified when both qualifications are met	-

FULL APPROVED CURRICULUM CONTENT

**6-SEMESTER PROFESSIONAL
ENGINEERING CURRICULUM**

**Java | MERN | AI/ML | Data Science | Cloud
(AWS) | Cyber Security)**



Program Outcomes

PO1 – Computational thinking & correct code

Think computationally and write correct, working code confidently in at least one language, building small programs from scratch.

ATTAINED THROUGH Programming for Problem Solving (+Lab), DS-Foundations spine; Semester 1–2.

PROOF-OF-WORK ~100 judged easy problems solved on the auto-judge + first small standalone C programs; a started daily-practice streak.

MEASURED BY Builder gate (end of Year 1): one language fluent, ~100 easy problems, streak active, first mini-project shipped.

PO2 – Data structures & algorithmic problem-solving

Model problems with the appropriate data structure, design and justify algorithms, and reason quantitatively about time/space complexity.

ATTAINED THROUGH DS-Foundations, Algorithms & Advanced DS, DAA, Discrete Maths ; Semesters 2–4.

PROOF-OF-WORK 60+ accepted DSA submissions spanning trees/graphs/hashing sorting, a complexity-analysis log, and first contest entries.

MEASURED BY Problem-Solver gate (end of Sem 4): DSA Easy/Medium fluency ; contest participation; readiness tier $\geq$ C.



PO3 – Real, multi-layer software engineering

Design and build real, multi-layer software that spans databases, networks and OS concerns, following an engineering process.

ATTAINED THROUGH	DBMS, Computer Networks, OS, Software Engineering, ERP; Semesters 4–6.
PROOF-OF-WORK	A shipped track project (Sem 5–6): a Postgres-backed, networked app with UML/design docs, sprint board and a reviewed codebase.
MEASURED BY	Engineer gate (end of Year 3): medium DSA + company-tagged sets started; one shipped track project; internship secured.

PO4 – Production-grade delivery & deployment

Deliver production-grade software end-to-end — deployed, monitored, CI/CD-backed — with a documented system design.

ATTAINED THROUGH	Project-I/II (Capstone), Semester Training / Industry Internship; Semesters 6–8
PROOF-OF-WORK	A deployed capstone product (real users, CI/CD, monitoring), repo, system-design doc and demo — the headline portfolio piece.
MEASURED BY	Job-Ready gate (Sem 7): target tier A/B; capstone shipped; company-aligned coverage; mocks cleared.



PO5 – Applied & AI-augmented engineering

Use AI effectively as an engineering amplifier — with a verification discipline — and build and evaluate AI/ Gen AI – powered features.

ATTAINED THROUGH .	AI-Augmented Engineering Part 1 (Sem 2) & Part 2 (Year 3), AI & Lab , Data Mining, ML electives; phased aware → assisted → builds-with → ships.
PROOF-OF-WORK	A prompt-and-verification logbook; an AI-powered feature shipped into the track project + an evaluation report on the AI output.
MEASURED BY	AI dimension of each rung gate; “Ship an AI product” checkpoint in Sem 7; evaluation rubrics on AI output.

PO6 – Career-track domain specialization

Demonstrate role-ready depth in one chosen career track (Full-Stack · Data & ML AI/GenAI · Cloud & DevOps).

ATTAINED THROUGH	Regrouped Electives I–V + track project + capstone all all flowing from one track; Semesters 5–8.
PROOF-OF-WORK	A track-coherent portfolio: electives, a track-specialized capstone artifact , and track-specific interview talking points.
MEASURED BY	Track project feature-completeness across Sem 5–7; elective proof-of-work; role-specific mock-interview rounds.



PO7 – Technical communication & professional presence

Communicate clearly in writing and speech — technical write-ups, presentations, group discussions — and maintain a professional resume/LinkedIn/GitHub presence

ATTAINED THROUGH	English (+Lab), continuous COMMUNICATE strand, HSMC/UHV; all semesters.
PROOF-OF-WORK	Technical presentations, structured resume iterations, a public GitHub with clean commit history, and cleared GD rounds.
MEASURED BY	COMMUNICATE modules tracked on the readiness score; resume v1 →v3; graduated mock-interview HR rounds.

PO8 – Teamwork & agile project delivery

Function effectively in a team using an agile process — sprints, standups, backlogs, code review, CI — and manage project milestones.

ATTAINED THROUGH	Software Engineering & Lab , ERP, Project-I/II, Mentoring (BMPD); Semesters 5–8.
PROOF-OF-WORK	Shipped track-project increments with a sprint board, issue tracking, reviewed PRs and milestone-tracked delivery.
MEASURED BY	Per-sprint progress and quality metrics on the platform; team-project milestone completion.



PO9 – Interview & placement readiness

Clear the full interview pipeline — DSA, system design and HR — at a target company tier, using company-aligned preparation.

ATTAINED THROUGH Open Elective-II (Placement Readiness), Mock Interviews, Live Interview Support; Semesters 7–8.

PROOF-OF-WORK A recorded mock-interview log, company-tagged problem coverage, and a readiness scorecard proving tier A/B coverage.

MEASURED BY Job-Ready gate: proctored mock OAs + DSA/sys-design/HR mock cycles cleared; readiness tier A/B.

PO10 – Evidence-backed proof-of-work portfolio

Accumulate and present an employer-readable, continuously-measured proof-of-work portfolio alongside the academic marksheet.

ATTAINED THROUGH MEASURE strand + Readiness Report; instrumented across all 8 semester

PROOF-OF-WORK Auto-accumulated record: problems solved, projects shipped (repos +demos), contest history, AI features built — with a 0–100 readiness score.

MEASURED BY The KodPrep Readiness Report itself: readiness score, skill heatmap, contest & mock history under one rubric.



PO11 – Ethics, integrity & responsible AI use

Act with professional and academic integrity, apply ethical judgement, and use AI responsibly — knowing its limits, data-privacy implications, and when not to use it.

ATTAINED THROUGH	AI-Augmented Engineering integrity guardrails, copilot-free Sem 1, UHV, Constitution / Traditional Knowledge; all years.
PROOF-OF-WORK	Reflective notes on professional and AI-use ethics; a copilot-free fundamentals record; graded integrity-aware submissions.
MEASURED BY	Integrity guardrails enforced on graded coding; reflective ethics assessments; UHV completion.

PO12 – Self-directed & lifelong learning

Sustain independent, continuous learning — a daily practice habit and rapid adaptation to new tools and paradigms, especially AI.

ATTAINED THROUGH	Daily-practice streak, self-directed DS-Foundations, evolving AI track, readiness-score self-tracking; all semesters.
PROOF-OF-WORK	A sustained practice streak, self-adopted new tools/frameworks in projects, and a readiness-score trajectory the student owns.
MEASURED BY	Streak analytics, skill-heatmap growth, and readiness-score deltas reviewed with a mentor.



KEY CERTIFICATIONS IN OUR CURRICULUM



MongoDB



Oracle Certified
Professional Java SE 11
Developer



TensorFlow



EC-Council (CEH)



AWS Certified
Solutions Architect
Associate



AWS Certified
Solutions Architect
Associate



AWS Certified Cloud
Practitioner



EC-Council (CEH)



Google Analytics
Certified Professional



Google Cloud Certified
Associate Cloud
Engineer



OUR COLLABORATIONS

Educational Partners



Lovely Professional University



Lamrin Tech Skills University



Guru Nanak Dev University



Rayat Bahra University



Jaypee Institute of Engineering & Technology



Noida International University



Chitkara University



IEC College of Engineering & Technology

Corporate Partners



L&T Education



Infosys



Brevo



HCL TECH



Cognizant



Capgemini



LEARN FROM THE TOP

1% DATA ANALYSTS / DATA SCIENTIST MENTORS

OUR TOP TRAINERS



Mr. Gulshan Sharma

Full Stack Development

15 Years Experience



Ms. Aarshi Gupta

AI/ML & DSA

7+ Years Experience



Mr. Pratik Agarwal

AI & Machine Learning

10 Years Experience



Ms. Vanshika Dubey

AI Development & Python

6+ Years Experience



Mr. Gauri Nandan

MERN Stack

10 Years Experience



**Mr. Gaurav Narayan
Prajapati**

Technical Training

5+ Years Experience



Ms. Achala

DSA Training

8+ Years Experience



Mr. Gokul

EST & DevOps

5+ Years Experience



**Mr. Manoj
Ravichandran**

Cloud Computing & AWS

6+ Years Experience



Mr. Dhyey Vyas

Python Full Stack

4+ Years Experience



Mr. Alok Kumar

DSA & MERN

7+ Years Experience



Mr. Deepak Sharma

Data Analytics & Python

8+ Years Experience



Evaluation Matrix

Theory Examinations – 20%
Practical Lab Assessments – 20%
Assignments & Coding Tests – 20%
Mini Projects – 10%
Major Projects & Documentation – 20%
Final Capstone & Interview Evaluation – 10%

Credit Structure (Per Semester)

Core Technical Subjects – 16 Credits
Laboratory & Practical Work – 6 Credits
Mini Project – 4 Credits
Major Project – 6 Credits
Professional Development – 4 Credits
Total Credits Per Semester – 36 Credits

Certification Framework

Oracle Java Certifications (Java Track)
MongoDB Associate Developer (MERN Track)
AWS Cloud Practitioner & AWS Developer Associate (Cloud Track)
Microsoft AI-900 & TensorFlow Developer (AI Track)
Google Data Analytics / Spark Certifications (Data Track)
CompTIA Security+ / Certified Ethical Hacker (Cyber Track)
Institute-Issued Specialization Certificate (All Tracks)
Professional Software Engineer – Track Specialization Certificate
System Design & Architecture Certification (Institute Issued)





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Delhi NCR**

