



Skill On Time
CORPORATE INSTITUTE

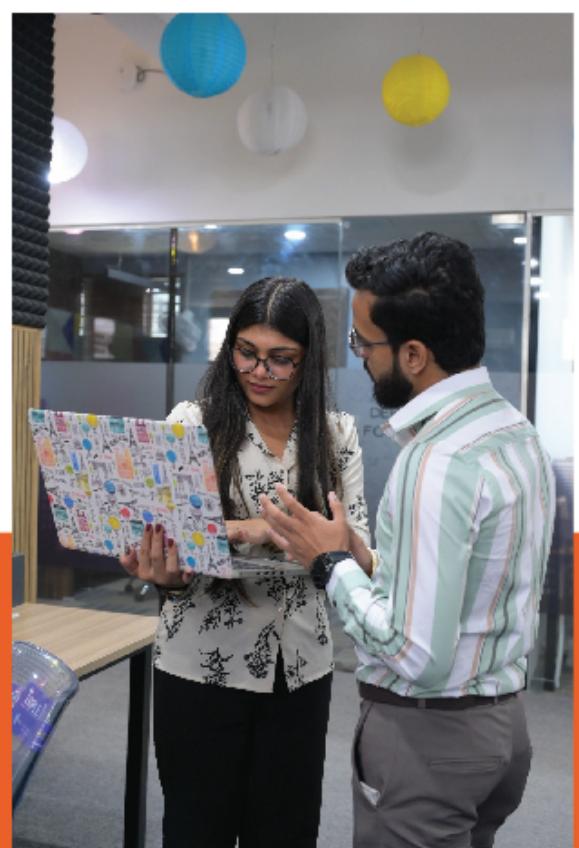
TRAINED MINDS TRANSFORM LIVES 

FULL STACK DEVELOPMENT

SYLLABUS

WHY SKILL ON TIME ?

- We provide the best facilities to our learners.
- Our goal is to make the student as a corporate expert.
- Our Prizes are affordable.
- Classes/Session are available online as well as offline.
- We Provide Course Pack.
- We provide recordings for the sessions.
- We are affordable.
- Corporate experts as professors.
- Guest lectures available.
- Doubt clearing sessions available.
- Working on Real time projects/ field work.
- Internships options.
- Certification given.
- Guidance for Interviews.



12-MONTH MERN STACK AND DSA COURSE

MONTH 1: INTRODUCTION TO WEB DEVELOPMENT & BASICS AND GIT

- WEEK 1: OVERVIEW OF WEB DEVELOPMENT

- BASICS OF HTML, CSS, AND JAVASCRIPT

- INTRODUCTION TO RESPONSIVE DESIGN

- WEEK 2: ADVANCED HTML AND CSS

- FLEXBOX, GRID, AND MODERN CSS FEATURES

- CSS PREPROCESSORS (OPTIONAL: SASS/LESS)

- WEEK 3: INTRODUCTION TO GIT AND VERSION CONTROL

- GIT INSTALLATION, BASIC COMMANDS (INIT, ADD, COMMIT)

- WORKING WITH REMOTE REPOSITORIES (GITHUB)

- WEEK 4: ADVANCED GIT CONCEPTS

- BRANCHING, MERGING, AND RESOLVING CONFLICTS

- GIT WORKFLOWS AND BEST PRACTICES

MONTH 2: TYPESCRIPT BASICS

- WEEK 1: INTRODUCTION TO TYPESCRIPT

- SETTING UP TYPESCRIPT IN A PROJECT

- BASIC TYPES, INTERFACES, AND FUNCTIONS

- WEEK 2: ADVANCED TYPESCRIPT FEATURES

- CLASSES, INHERITANCE, AND GENERICS

- UTILITY TYPES AND ADVANCED TYPES



- WEEK 3: TYPESCRIPT WITH JAVASCRIPT LIBRARIES
 - USING TYPESCRIPT WITH POPULAR JAVASCRIPT LIBRARIES
 - TYPE DEFINITIONS AND MANAGING DEPENDENCIES
 - WEEK 4: TYPESCRIPT BEST PRACTICES
 - TYPE SAFETY AND CODE QUALITY
 - REFACTORING JAVASCRIPT CODE TO TYPESCRIPT
- MONTH 3: INTRODUCTION TO NODE.JS & EXPRESS
- WEEK 1: NODE.JS FUNDAMENTALS
 - NODE.JS RUNTIME AND CORE MODULES
 - SETTING UP A NODE.JS PROJECT
 - WEEK 2: BUILDING APIs WITH EXPRESS.JS
 - SETTING UP AN EXPRESS SERVER
 - ROUTING, MIDDLEWARE, AND ERROR HANDLING
 - WEEK 3: ADVANCED EXPRESS.JS
 - AUTHENTICATION AND AUTHORIZATION (JWT, SESSIONS)
 - ERROR HANDLING AND VALIDATION
 - WEEK 4: INTEGRATING WITH DATABASES
 - BASICS OF CONNECTING NODE.JS TO DATABASES
 - INTRODUCTION TO MONGODB
- MONTH 4: MONGODB & MONGOOSE
- WEEK 1: INTRODUCTION TO MONGODB
 - BASICS OF NOSQL DATABASES
 - MONGODB INSTALLATION AND CRUD OPERATIONS



- WEEK 2: MONGOOSE BASICS
 - SETTING UP MONGOOSE WITH NODE.JS
 - DEFINING SCHEMAS AND MODELS
 - WEEK 3: ADVANCED MONGOOSE
 - DATA VALIDATION AND RELATIONSHIPS
 - QUERY OPTIMIZATION AND INDEXING
 - WEEK 4: MONGODB AGGREGATION AND PERFORMANCE
 - AGGREGATION FRAMEWORK
 - PERFORMANCE TUNING AND BEST PRACTICES
- MONTH 5: REACT BASICS AND REDUX
- WEEK 1: REACT FUNDAMENTALS
 - COMPONENTS, PROPS, AND STATE
 - FUNCTIONAL VS. CLASS COMPONENTS
 - WEEK 2: REACT HOOKS
 - USESTATE, USEEFFECT, AND CUSTOM HOOKS
 - MANAGING SIDE EFFECTS AND CONTEXT
 - WEEK 3: REACT ROUTER AND NAVIGATION
 - SETTING UP REACT ROUTER
 - HANDLING NAVIGATION AND ROUTING
 - WEEK 4: REDUX INTRODUCTION
 - STATE MANAGEMENT AND PROPS
 - KNOWLEDGE OF REDUCERS, SLICES, ACTIONS



- WEEK 2: MONGOOSE BASICS
 - SETTING UP MONGOOSE WITH NODE.JS
 - DEFINING SCHEMAS AND MODELS
 - WEEK 3: ADVANCED MONGOOSE
 - DATA VALIDATION AND RELATIONSHIPS
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MONTH 6: TYPESCRIPT WITH REACT

- WEEK 1: SETTING UP TYPESCRIPT WITH REACT
 - CONFIGURING TYPESCRIPT IN A REACT PROJECT
 - TYPE ANNOTATIONS FOR PROPS AND STATE
- WEEK 2: ADVANCED TYPESCRIPT IN REACT
 - TYPESCRIPT WITH REACT HOOKS AND CONTEXT
 - USING TYPESCRIPT WITH REDUX (OPTIONAL)
- WEEK 3: ERROR BOUNDARIES AND TESTING
 - IMPLEMENTING ERROR BOUNDARIES IN REACT
 - BASIC TESTING WITH JEST AND REACT TESTING LIBRARY
- WEEK 4: PERFORMANCE OPTIMIZATION
 - CODE SPLITTING AND LAZY LOADING
 - MEMOIZATION AND OPTIMIZATION TECHNIQUES

MONTH 7: TAILWIND CSS

- WEEK 1: INTRODUCTION TO TAILWIND CSS
 - SETTING UP TAILWIND CSS IN A PROJECT
 - UNDERSTANDING UTILITY-FIRST CSS PRINCIPLES
- WEEK 2: ADVANCED TAILWIND CSS
 - CUSTOMIZING TAILWIND CONFIGURATION
 - CREATING RESPONSIVE DESIGNS WITH TAILWIND
- WEEK 3: TAILWIND CSS WITH REACT
 - USING TAILWIND CSS IN REACT COMPONENTS
 - BUILDING LAYOUTS AND STYLING COMPLEX COMPONENTS



- WEEK 4: BEST PRACTICES AND OPTIMIZATION

- OPTIMIZING TAILWIND CSS FOR PRODUCTION

- BEST PRACTICES FOR MAINTAINING SCALABLE STYLES

MONTH 8: DATA STRUCTURES & ALGORITHMS (DSA) BASICS

- WEEK 1: INTRODUCTION TO DSA

- BASICS OF ALGORITHMS AND DATA STRUCTURES

- BIG-O NOTATION AND COMPLEXITY ANALYSIS

- WEEK 2: ARRAYS AND STRINGS

- OPERATIONS AND PROBLEMS WITH ARRAYS AND STRINGS

- COMMON ALGORITHMS AND USE CASES

- WEEK 3: LINKED LISTS AND STACKS

- SINGLY AND DOUBLY LINKED LISTS

- STACK OPERATIONS AND APPLICATIONS

- WEEK 4: QUEUES AND HASH TABLES

- QUEUE OPERATIONS AND APPLICATIONS

- INTRODUCTION TO HASH TABLES AND HASHING

MONTH 9: ADVANCED DSA CONCEPTS

- WEEK 1: TREES AND GRAPHS

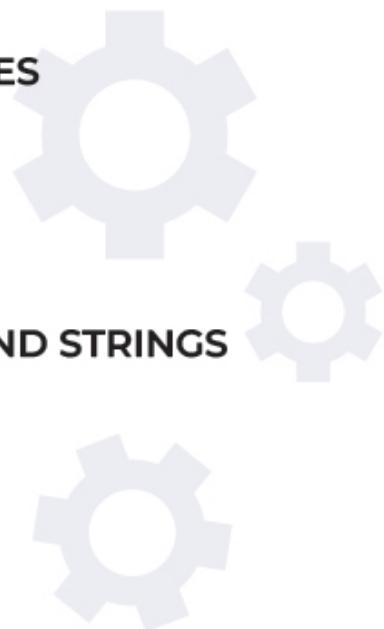
- BINARY TREES, BINARY SEARCH TREES, AND AVL TREES

- GRAPH REPRESENTATIONS AND TRAVERSAL ALGORITHMS

- WEEK 2: ADVANCED TREE STRUCTURES

- RED-BLACK TREES, B-TREES, AND TRIES

- TREE ALGORITHMS AND APPLICATIONS



- WEEK 3: GRAPH ALGORITHMS
 - SHORTEST PATH ALGORITHMS (DIJKSTRA'S, BELLMAN-FORD)
 - MINIMUM SPANNING TREES (KRUSKAL'S, PRIM'S)
 - WEEK 4: DYNAMIC PROGRAMMING
 - FUNDAMENTALS OF DYNAMIC PROGRAMMING
 - COMMON DP PROBLEMS AND SOLUTIONS
- MONTH 10: NEXT.JS BASICS
- WEEK 1: INTRODUCTION TO NEXT.JS
 - SETTING UP A NEXT.JS PROJECT
 - PAGES, ROUTING, AND STATIC GENERATION
 - WEEK 2: DYNAMIC ROUTING AND API ROUTES
 - DYNAMIC ROUTES AND PARAMETERS
 - CREATING API ROUTES IN NEXT.JS
 - WEEK 3: STYLING IN NEXT.JS
 - USING CSS MODULES AND GLOBAL STYLES
 - INTEGRATING TAILWIND CSS WITH NEXT.JS
 - WEEK 4: DATA FETCHING AND OPTIMIZATION
 - DATA FETCHING METHODS
 - PERFORMANCE OPTIMIZATION TECHNIQUES
- MONTH 11: SYSTEM DESIGN AND ARCHITECTURE
- WEEK 1: INTRODUCTION TO SYSTEM DESIGN
 - OVERVIEW OF SYSTEM DESIGN PRINCIPLES
 - SCALABILITY, PERFORMANCE, AND RELIABILITY



- WEEK 2: DESIGNING SCALABLE SYSTEMS
 - LOAD BALANCING, CACHING, AND DATABASE DESIGN
 - WEEK 3: REAL-WORLD SYSTEM DESIGN PATTERNS
 - MICROSERVICES, EVENT-DRIVEN ARCHITECTURE
 - WEEK 4: CASE STUDY: DESIGNING A SCALABLE APPLICATION
 - APPLYING SYSTEM DESIGN PRINCIPLES TO A REAL-WORLD SCENARIO
- MONTH 12: ADVANCED TOPICS AND LIVE PROJECT
- WEEK 1: REVIEW AND ADVANCED TOPICS
 - REVIEWING KEY CONCEPTS FROM MERN STACK AND DSA
 - ADVANCED TOPICS AND EMERGING TECHNOLOGIES
 - WEEK 2: LIVE PROJECT PLANNING
 - DEFINING PROJECT SCOPE AND REQUIREMENTS
 - PLANNING AND SETTING MILESTONES
 - WEEK 3: LIVE PROJECT DEVELOPMENT
 - WORKING ON THE LIVE PROJECT
 - APPLYING ALL LEARNED SKILLS IN A COMPREHENSIVE PROJECT
 - WEEK 4: FINALIZATION AND PRESENTATION
 - COMPLETING AND POLISHING THE LIVE PROJECT
 - PREPARING AND PRESENTING THE PROJECT
 - RESUME BUILDING, INTERVIEW PREPARATION, AND CAREER ADVICE