

**PLACEMENT FOR SURE BATCH**  
**COURSE CONTENTS**

**Aptitude and Logical Reasoning:**

<b><u>Aptitude</u></b>	<b><u>Logical Reasoning</u></b>
<ul style="list-style-type: none"><li>• Number Systems</li><li>• Arithmetic Progression</li><li>• Geometric Progression</li><li>• Percentage</li><li>• Ratio &amp; Proportions</li><li>• Averages</li><li>• Ages</li><li>• Profit &amp; Loss</li><li>• Alligation &amp; Mixture</li><li>• Chain Rule</li><li>• Time &amp; Work</li><li>• Pipes &amp; Cisterns</li><li>• Speed, Time &amp; Distance</li><li>• Clocks</li><li>• Calendar</li><li>• Simple Interest</li><li>• Compound Interest</li><li>• Logarithms</li><li>• Set Theory</li><li>• Heights and Distance</li><li>• Area</li><li>• Volume</li><li>• Permutation &amp; Combination</li><li>• Probability</li><li>• Data Interpretation</li></ul>	<ul style="list-style-type: none"><li>• Number Series</li><li>• Odd Man Out</li><li>• Analogy</li><li>• Coding Decoding</li><li>• Direction</li><li>• Seating and Circular Arrangement</li><li>• Syllogism</li><li>• Venn Diagram</li><li>• Mirror Images</li><li>• Data Sufficiency</li><li>• Blood Relations</li><li>• Statement and Assumptions</li><li>• Statement and Conclusion</li><li>• Course of Action</li><li>• Cause and Effect</li><li>• Cubes and Dice</li><li>• Cube and Cuboids</li><li>• Logical Problems</li><li>• Distribution</li><li>• Puzzles</li></ul>

**Verbal:**

- Spotting Errors
- Sentence completion
- Jumbled Sentences
- Sentence Improvement
- Reading comprehension
- Tenses
- Vocabulary



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- Flowchart Type questions
- Articles
- All you need to know score good in this section.

### **Group Discussion and Personal Interview:**

<b><u>Group Discussions</u></b>	<ul style="list-style-type: none"> <li>• What is Group Discussion?</li> <li>• Objectives of GD</li> <li>• Types of GD</li> <li>• Words from the wise</li> <li>• Skills assessed</li> <li>• Common mistakes</li> <li>• Initiation: It's all about bringing out the leader in you!!</li> <li>• Initiation Techniques</li> <li>• Closing Statements</li> <li>• Interruption</li> <li>• Taking Leadership</li> <li>• Body Language</li> <li>• Eye contact</li> <li>• Group behavior</li> <li>• Selection Criteria's</li> <li>• Analyzing competition</li> <li>• Verbal communication</li> <li>• Non-verbal communication</li> <li>• Simultaneous Talks</li> <li>• Technical aspects</li> <li>• Focus on technical and non-technical topics</li> <li>• Guidance according to company</li> </ul>
<b><u>Interviews</u></b>	<ul style="list-style-type: none"> <li>• What is interview??</li> <li>• Types interview</li> <li>• Qualities that an interviewer look for!!</li> <li>• Just before interview</li> <li>• Your Introduction in interview</li> <li>• Maintaining Right mindset</li> <li>• Do's and Don'ts during interview</li> <li>• Body language</li> <li>• Voice levels</li> <li>• Analyzing interviewer</li> <li>• Negatives Leading to rejection</li> <li>• Technical aspects</li> <li>• Structured Interviews</li> </ul>



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	<ul style="list-style-type: none"> <li>• Handling the “Suicide &amp; tricky questions”!!</li> <li>• Handling Puzzles</li> <li>• HR questions and ideal answers</li> <li>• Handling multiple panel</li> <li>• Managerial interview situations</li> <li>• Salary negotiations</li> <li>• Questions you can ask to interviewer!!</li> <li>• Closing the interview</li> </ul>
<b><u>Group Activity</u></b>	<ul style="list-style-type: none"> <li>• What is group activity?</li> <li>• How to deal?</li> <li>• Breaking competition</li> <li>• How to lead?</li> <li>• Analyzing situations</li> <li>• Selection criteria's</li> <li>• Teamwork</li> <li>• All you need to know to cross this unexpected round.</li> </ul>

### **Resume Building:**

<ul style="list-style-type: none"> <li>• Introduction to resume</li> <li>• Types of resumes</li> <li>• Preparing to write your resume</li> <li>• Presentation</li> <li>• Professional objective</li> <li>• Education section</li> <li>• Experience section</li> <li>• Writing Skills</li> <li>• Honors and awards section</li> <li>• Activities and interests section</li> <li>• Bolstering your resume</li> <li>• Polishing your resume</li> <li>• Cover letters</li> <li>• Putting cherry on cake!!</li> </ul>
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### **Programming Languages:**

<b><u>C</u></b>	<ul style="list-style-type: none"> <li>• Basic concepts</li> <li>• Array</li> <li>• Pointers</li> <li>• String</li> <li>• Functions</li> </ul>
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	<ul style="list-style-type: none"> <li>• Recursion</li> <li>• Pointers and Function</li> <li>• Structure and Union</li> <li>• Dealing with memory</li> <li>• Working with Files</li> <li>• Advanced Topics (linux systems calls, bit fields,etc)</li> <li>• Coding practice</li> </ul>
<b><u>C++</u></b>	<ul style="list-style-type: none"> <li>• Basic differences between C and C++</li> <li>• oop concepts with real time examples (Freq)</li> <li>• class and object</li> <li>• Data abstraction vs encapsulation (Freq)</li> <li>• Inheritance</li> <li>• polymorphism</li> <li>• Function Overloading</li> <li>• Constructors and Destructor</li> <li>• Operator overloading</li> <li>• virtual functions</li> <li>• Exception handling</li> <li>• Namespaces</li> <li>• Dynamic memory management</li> <li>• Shallow and Deep copies</li> <li>• Coding practice</li> </ul>
<b><u>Java</u></b>	<p>Module 1:</p> <ul style="list-style-type: none"> <li>• Understanding JVM, JRE, JDK</li> <li>• Java as pure OOPL</li> <li>• Comparision with C/C++</li> <li>• Java Basics</li> </ul> <p>Module 2:</p> <ul style="list-style-type: none"> <li>• Understanding Object Class</li> <li>• Accessors(getters) &amp; Mutators (setters) Concept</li> <li>• toString() Method</li> <li>• Polymorphism</li> </ul> <p>Module 3:</p> <ul style="list-style-type: none"> <li>• Var Args (Variable Arguments ) Concept</li> <li>• Constructor Chaning</li> <li>• Into Inheritance</li> <li>• Using Super()</li> <li>• Method Overriding</li> <li>• Wrapper classes</li> </ul> <p>Module 4:</p> <ul style="list-style-type: none"> <li>• Variants of Inheritance &amp; polymorphism</li> </ul>



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- Dynamic Method Dispatch
- Covariant variables
- Interfaces in java
- Using Interfaces
- Marker Interfaces and their applications
- Understanding the change in newer versions of Java

#### Module 5:

- Introduction To Exception Handling
- Understanding Some basic Exceptions
- Writing Try Catch Blocks
- Multiple Catches Concept
- Finally block
- Garbage collection

#### Module 6:

- Multiprocessing, Multitasking and Multithreading
- Understanding how threads can bring change in industrial applications
- Thread life cycle
- Applying inbuilt classes
- Thread scheduling concepts in operating systems
- Service threads
- Multithreading programming using java

#### Module 7:

- Deciding priorities in thread
- Deadlock concept
- Inter thread communications
- Applying Synchronization

#### Module 8:

- Autoboxing and Unboxing
- Enumerations
- The Mystery - String...StringBuilder...StringBuffer
- Java Inner Classes
- Understanding java.util.Date

#### Module 9:

- Introduction to generics
- Ambiguities in generics
- Applying generics in applications
- Brief about Collection Framework
- Diversity in collection framework
- Interfaces and classes involved
- Applying collections in programs
- The differentiated component – Maps



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	<ul style="list-style-type: none"> <li>• Introduction to utility and bean classes</li> </ul> <p>Module 10:</p> <ul style="list-style-type: none"> <li>• Revising Databases and uses</li> <li>• The Connection Maker – Java Database Connectivity</li> <li>• Connecting different databases to applications</li> <li>• Diving deep into JDBC</li> <li>• Analysing various classes and interfaces</li> <li>• Comparing JDBC with others</li> </ul>
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## **Data Structures :**

<b><u>Arrays</u></b>	<ul style="list-style-type: none"> <li>• What's so special about Arrays?</li> <li>• Data Structures vs APIs</li> <li>• How to insert into an Array</li> <li>• How to delete an Array element</li> <li>• How to resize Arrays dynamically</li> <li>• Lab: Let's build a Dynamic Array from scratch</li> </ul>
<b><u>Linked Lists</u></b>	<ul style="list-style-type: none"> <li>• What is a Linked List?</li> <li>• What makes a Linked List different from an Array?</li> <li>• Add Front</li> <li>• Get First / Get Last</li> <li>• Add back</li> <li>• Size</li> <li>• Clear</li> <li>• Delete With Value</li> <li>• Double Linked Lists</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Big O Notation</u></b>	<ul style="list-style-type: none"> <li>• What is Big O Notation?</li> <li>• The Big O Cheat Sheet</li> <li>• Lab: Testing ourselves on our Big O Notation</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Stacks &amp; Queues</u></b>	<ul style="list-style-type: none"> <li>• What are Stacks and Queues?</li> <li>• What is the Stack and Queue killer feature?</li> <li>• How to push and pop onto a Stack</li> <li>• How to add and remove from a Queue</li> <li>• Runtime characteristics of Stacks and Queues</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Hash Tables</u></b>	<ul style="list-style-type: none"> <li>• What so great about Hash Tables?</li> <li>• How does hashing work?</li> <li>• How do you convert a hash into its index?</li> </ul>



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	<ul style="list-style-type: none"> <li>• Runtime characteristics of Hash Tables</li> <li>• Lab: How to build a Hash Table from scratch</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Binary Trees</u></b>	<ul style="list-style-type: none"> <li>• What is a Binary Tree?</li> <li>• How do you insert into a Binary Search Tree?</li> <li>• How do you find the minimum in a Binary Search Tree?</li> <li>• How does delete work in a Binary Search Tree?</li> <li>• What are some different ways you can traverse Binary Trees?</li> <li>• Runtime characteristic of Binary Search Tree</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Binary Heaps</u></b>	<ul style="list-style-type: none"> <li>• What are Binary Heaps and what are they good for?</li> <li>• How do Binary Heaps work?</li> <li>• How do you insert into a Binary Heap?</li> <li>• How do you extract the max?</li> <li>• Lab: How to build a Binary Heap from scratch</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Fibonacci Series &amp; Memoization</u></b>	<ul style="list-style-type: none"> <li>• What's a Fibonacci series?</li> <li>• What's memoization and how can it help?</li> <li>• Lab: How to build a memoized Fibonacci series from scratch</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Searching Algorithms</u></b>	<ul style="list-style-type: none"> <li>• Linear Search</li> <li>• Binary Search</li> <li>• Ternary search</li> <li>• exponential Search</li> <li>• logarithmic Search</li> <li>• Fibonacci Search</li> </ul>
<b><u>Sorting Algorithms</u></b>	<ul style="list-style-type: none"> <li>• What is the Bubble Sort?</li> <li>• Bubble Sort in code</li> <li>• Runtime characteristic of Bubble Sort</li> <li>• What is Merge Sort?</li> <li>• Merge Sort in code</li> <li>• Runtime characteristic of Merge Sort</li> <li>• What is Quicksort?</li> <li>• Quicksort in code</li> <li>• Runtime characteristic of Quicksort</li> <li>• What you need to know for the interview</li> </ul>
<b><u>Graphs</u></b>	<ul style="list-style-type: none"> <li>• What exactly are graphs?</li> <li>• What does the graph data structure look like?</li> <li>• Breadth First Search (BFS)</li> </ul>



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- Lab: Breadth First from scratch
- Depth First Search (DFS)
- Lab: Depth First from scratch
- What you need to know for the interview

## **Operating Systems and Computer Architecture:**

<b><u>CPU Scheduling</u></b>	<ul style="list-style-type: none"> <li>• Process</li> <li>• States of a process</li> <li>• Process Table and Process Control Block (PCB)</li> <li>• Process Scheduler</li> <li>• CPU Scheduling</li> <li>• Difference between dispatcher and scheduler</li> <li>• FCFS Scheduling</li> <li>• Convoy Effect in Operating Systems</li> <li>• Belady's Anomaly</li> </ul>
<b><u>Process Synchronization</u></b>	<ul style="list-style-type: none"> <li>• Critical Section</li> <li>• Inter Process Communication</li> <li>• IPC through shared memory</li> <li>• IPC using Message Queues</li> <li>• Semaphores in operating system</li> <li>• Mutex vs. Semaphore</li> <li>• Peterson's Algorithm for Mutual Exclusion</li> <li>• Dekker's algorithm</li> <li>• Bakery Algorithm</li> <li>• Producer Consumer Problem using Semaphores</li> <li>• Dining Philosopher Problem Using Semaphores</li> <li>• Dining-Philosophers Solution Using Monitors</li> <li>• Readers-Writers Problem</li> <li>• Reader-Writers solution using Monitors</li> <li>• Lock variable synchronization mechanism</li> <li>• Mutex lock for Linux Thread</li> </ul>
<b><u>Deadlock</u></b>	<ul style="list-style-type: none"> <li>• Deadlock Introduction</li> <li>• Deadlock Detection And Recovery</li> <li>• Deadlock Prevention And Avoidance</li> <li>• Banker's Algorithm</li> <li>• Resource Allocation Graph (RAG)</li> <li>• Methods of resource allocation to processes by operating system</li> </ul>
<b><u>Processes &amp; Threads</u></b>	<ul style="list-style-type: none"> <li>• Thread</li> <li>• Threads and its types</li> </ul>



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	<ul style="list-style-type: none"> <li>• User Level thread Vs Kernel Level thread</li> <li>• Process-based and Thread-based Multitasking</li> <li>• Multi threading models</li> <li>• Benefits of Multithreading</li> </ul>
<b><u>Memory Management</u></b>	<ul style="list-style-type: none"> <li>• Swapping</li> <li>• Paging</li> <li>• Memory management – mapping virtual address to physical addresses</li> <li>• Page Table Entries</li> <li>• Virtual Memory</li> <li>• Virtual Memory Questions</li> <li>• Operating system based Virtualization</li> <li>• Inverted Page Table</li> <li>• Swap Space</li> <li>• Page Fault Handling</li> <li>• Segmentation</li> <li>• Memory Segmentation in 8086 Microprocessor</li> <li>• Static and Dynamic Libraries</li> </ul>

## **Database :**

<b><u>Basics</u></b>	<ul style="list-style-type: none"> <li>• What is database?</li> <li>• Advantages and Disadvantages of DBMS (Interview Point of view)</li> <li>• Levels of data abstraction in database</li> <li>• Structured vs unstructured databases</li> <li>• Deciding proper database for an application</li> <li>• Other types of storages</li> <li>• Transparent DBMS</li> <li>• Data ware housing</li> <li>• Online analytical processing (OLAP)</li> <li>• ORDBMS</li> <li>• Security of databases</li> <li>• Data independence and its types</li> <li>• Two and three tier architecture</li> <li>• Types of constraints</li> <li>• Codd rules</li> <li>• Types of keys</li> <li>• Languages in Database</li> <li>• Different types of queries</li> <li>• Query processing</li> </ul>
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	<ul style="list-style-type: none"> <li>• CRUD operations</li> <li>• Integrity rules of database</li> <li>• ACID properties with real life examples</li> <li>• Checkpoints in DBMS</li> <li>• Revision of ER diagram and components</li> <li>• Data modeling with ER model</li> </ul>
<b><u>Writing queries</u></b>	<ul style="list-style-type: none"> <li>• Understanding datatypes</li> <li>• SQL operators</li> <li>• Aggregate Functions</li> <li>• Date functions</li> <li>• Joins</li> <li>• SQL sequences</li> <li>• Set Operations</li> <li>• Views</li> <li>• SQL Alias</li> <li>• Setting Indexes</li> <li>• Sub queries</li> <li>• Clauses</li> <li>• Views</li> <li>• Keywords</li> <li>• SQL wildcards</li> <li>• Pattern matching</li> <li>• Null functions</li> <li>• Queries for scenario</li> <li>• Things you need to know from interview point of view!!</li> </ul>
<b><u>Advanced</u></b>	<ul style="list-style-type: none"> <li>• Introduction to cursors</li> <li>• Overview of triggers</li> <li>• Normalization concepts</li> <li>• Denormalization</li> <li>• RAID levels</li> <li>• SQL injection</li> <li>• Parallel Databases</li> <li>• Distributed databases</li> <li>• Little more about non-SQL databases</li> </ul>

## **Computer Networks :**

<b><u>Basics</u></b>	<ul style="list-style-type: none"> <li>• What is network?</li> <li>• Network topologies?</li> <li>• Internet</li> <li>• Intranet</li> </ul>
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	<ul style="list-style-type: none"> <li>• Extranet</li> <li>• OSI model</li> <li>• Hub</li> <li>• Switch</li> <li>• Router</li> <li>• IPV4</li> <li>• IPV6</li> <li>• Ports</li> <li>• Firewall</li> </ul>
<b><u>Protocols and their working</u></b>	<ul style="list-style-type: none"> <li>• TCP and UDP</li> <li>• DNS</li> <li>• DNS resolution</li> <li>• Domains</li> <li>• Proxy servers</li> <li>• IP address</li> <li>• IANA</li> <li>• ICANN</li> <li>• NIC</li> <li>• VPN</li> <li>• Unicast, Anycast, multicast, Broadcast</li> <li>• Data transferring modes</li> <li>• Static vs dynamic IP</li> <li>• Beaconsing</li> <li>• Link and nodes</li> <li>• Subnetting overview</li> <li>• MAC address</li> <li>• Private address</li> <li>• DHCP</li> <li>• Basic commands-netsh, netstat, ping, ipconfig</li> <li>• TCP handshake protocol</li> <li>• RSA algorithm</li> <li>• Hashes</li> <li>• Piggybacking</li> <li>• Stop n wait</li> <li>• Network reliability criteria</li> </ul>
<b><u>Advanced</u></b>	<ul style="list-style-type: none"> <li>• Some commands</li> <li>• Mail spoofing</li> <li>• Encryption and decryption</li> <li>• Backbone network</li> <li>• Sneakernet</li> <li>• Cryptography</li> </ul>



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## **Software Engineering :**

<b><u>Basics</u></b>	<ul style="list-style-type: none"><li>• What is software engineering?</li><li>• Categories of software</li><li>• Software Development Life Cycle (SDLC)</li><li>• SDLC models overview</li><li>• Project management</li><li>• CAST tools</li><li>• Types of maintenance</li><li>• Functional and Non-functional requirements</li><li>• Software Requirement Specification (SRS)</li><li>• Cohesion and Coupling</li><li>• Static Modelling overview</li><li>• Dynamic Modeling overview</li><li>• Top-down and Bottom-up design model</li><li>• Functional Programming Concept</li><li>• Static vs dynamic diagrams</li><li>• Overview of UML diagrams</li><li>• Things you need to know for interview</li></ul>
<b><u>Testing</u></b>	<ul style="list-style-type: none"><li>• Validation and Verification</li><li>• Cyclomatic complexity</li><li>• Generalizations and associations</li><li>• Function points</li><li>• Software metrics – Product, Process and Project</li><li>• White box testing</li><li>• Black box testing</li><li>• CASE tools</li><li>• Testing and its types</li><li>• Types of errors</li><li>• Quality assurance</li><li>• Quality control</li><li>• Unit Testing</li><li>• Integration testing</li><li>• Introduction to selenium tool</li></ul>

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