**Overall Overview of an application [Week 1]**

**GitHub [Week 1]**

1. What is GitHub and why is it used?
2. Setting up Git
3. Working with GitHub
4. Basics on Pull, Push, Commit, Merge, Pull Request

**Core Java [Week 1 – Week 9]**

1. Overview of Java **[Week 1 – Week 2]**
   1. OOP's principles - High level
   2. Sample Program
   3. Keywords in Java
   4. Basic Syntax
   5. Variable/Class namings
2. Data Types, Variables in Java **[Week 2]**
3. Operators in Java **[Week 2 ]**
   1. Arithmetic Operators
   2. Bitwise Operators
   3. Relational Operators
   4. Boolean Logical Operators
   5. Ternary Operator and Short-circuit operators
   6. Operator Precedence
   7. Programs on all the above.
4. Control Statements **[Week 3 ]**
   1. if else
   2. switch
   3. while
   4. do-while
   5. for, foreach, nested for loops
   6. break, continue return
5. Arrays **[Week 3 - Week 4]**
   1. One dimension
   2. 2 dimensions
6. Recursion **[Week 4]**
7. Classes in Java **[Week 4]**
   1. Basic Class creation
   2. Constructor, Parameterised Constructor
8. Classes and Methods **[Week 5]**
   1. Creating methods in class
   2. Accessing methods
   3. Constructor Overloading
9. Access Control **[Week 5]**
10. Understanding static, final **[Week 5]**
11. Nested and Inner classes **[Week 5]**
12. Inheritance **[Week 6]**
    1. Basics
    2. Using super
    3. Creating multilevel hierarchy
    4. Method Overriding
    5. Abstract classes
    6. Method overloading
13. Packages and Interfaces **[Week 6]**
14. Exception Handling **[Week 6]**
    1. What is Exception Handling?
    2. try-catch-finally explanation
    3. Nested try
    4. throw, throws
15. String class **[Week 7]**
    1. Basic String creation and operations
    2. Equals vs ==
    3. Hashcode
    4. Other string methods (split, endsWith, contains and many others)
    5. StringBuffer/StringBuilder Overview
16. Collection Framework **[Week 7 – Week 8]**
    1. Collection Framework overview
    2. List - Interface and Implementation classes
    3. Set - Interface and Implementation classes
    4. Comparators
17. Maps in Java **[Week 8]**
18. Utility Classes **[Week 9]**
    1. Date/Calendar
    2. Scanner Class - For reading data
19. Input/Output Classes **[Week 9]**
    1. How to read files?
    2. InputStream, OutputStream
    3. Basic Readers/Writers
20. Garbage Collection in Java – Quick overview **[Week 9]**
21. Java Lambda Expressions **[Week 9]**
    1. What is functional programming in Java?
    2. Functional Programming techniques
    3. Predicates and Function
    4. Other things (We will deep dive only if we have additional time)
22. Multithreading in Java **[Week 9]**
    1. What are threads?
    2. How to achieve multithreading?
    3. Where is it used?
    4. Simple Program(We will deep dive only if we have additional time)

**Database[Week 9]**

1. What is a database and why do we need it?
2. Creating basic tables and understanding constraints
3. Joins in databases
4. Some basic queries

**Spring[Week 10]**

1. Introduction to Spring **[Week 10]**
   1. What is Spring?
   2. IoC Container
2. Component Scanning **[Week 10]**
3. Bean Life Cycle **[Week 10]**
   1. What is a bean in Spring?
   2. How to create a bean in Spring?
4. Spring MVC **[Week 10]**
   1. High level overview
5. Spring Annotations **[Week 10]**
6. Sample Programs using Spring **[Week 10]**

**Maven [Week 10]**

1. What is Maven?
2. Need and benefits of maven
3. Creating a Maven project

**Spring Boot + Microservices + REST API’s[Week 10 – Week 12]**

1. Introduction to Spring Boot **[Week 10]**
2. Difference between Spring and Spring Boot**[Week 11]**
3. Create a Spring Boot project using Spring Initializr **[Week 11]**
4. Spring Boot General Architecture flow **[Week 11]**
5. Important Spring Boot Annotation **[Week 11]**
6. REST API’s **[Week 12]**
   1. Understanding what REST API’s mean
   2. Building REST API’s with Spring Boot
   3. Difference REST methods (GET, PUT,POST,DELETE)
7. Microservices**[Week 12]**
   1. Understanding what microservices mean
   2. Building microservices with Spring Boot
8. How to configure to connect to a database**[Week 12]**
9. Understanding Controllers, RESTful Endpoints**[Week 12]**

**In Table format:**

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| --- | --- |
| Week | Topics to Cover |
| Week 1 | * GitHub * Overview of Java |
| Week 2 | * Overview of Java * Data Types, Variables in Java * Operators in Java |
| Week 3 | * Control Statements * Arrays |
| Week 4 | * Arrays * Recursion * Classes in Java |
| Week 5 | * Classes and Methods * Access Control * Understanding static, final * Nested and Inner classes |
| Week 6 | * Inheritance * Packages and Interfaces * Exception Handling |
| Week 7 | * String class * Collection Framework * Maps in Java |
| Week 8 | * Utility Classes * Input/Output Classes * Garbage Collection in Java – Quick overview * Java Lambda Expressions * Multithreading in Java |
| Week 9 | * Database |
| Week 10 | * Spring * Maven |
| Week 11 - 12 | * Spring Boot * Microservices * REST API’s |