# Java Syllabus

**Basics:**

* **Introduction to Java:** History, features, JDK setup, first Java program, how JVM works.
* **Data Types, Variables, and Arrays:** Primitive data types, operators, arrays.
* **Control Statements:** If-else, switch, for, while do-while loops.
* **Classes and Objects:** OOP principles, constructors, method overloading and overriding, static keyword, this keyword.
* **Inheritance:** Super keyword, final keyword, polymorphism, dynamic method dispatch.
* **Packages and Interfaces:** Access protection, import statement, interfaces.
* **Exception Handling:** Try, catch, finally blocks, custom exceptions.

**Intermediate:**

* **Multithreading:** Lifecycle, creating threads, thread priorities, synchronization.
* **I/O Streams:** Byte and character streams, predefined streams, file handling.
* **Networking:** InetAddress class, URL, sockets, implementing client-server communication.
* **Java Collections Framework (JCF):** ArrayList, Vector, LinkedList, HashSet, TreeSet, HashMap, TreeMap, iterating collections, comparators.

**Advanced Topics:**

* **Generics:** Why generics, generic classes and methods, wildcard arguments.
* **Lambda Expressions:** Functional interfaces, lambda expressions, method references.
* **Annotations:** Basics, built-in annotations, custom annotations.
* **Java Module System:** Modules introduction, defining modules, module path vs classpath.

**GUI Development:**

* **Swing:** JFrame, JPanel, JButton, JLabel, JTextField, event handling, layout managers.
* **AWT (Abstract Window Toolkit):** Components, event handling, layouts, graphics.

**JavaFX (For Rich Internet Applications):**

* **Getting Started with JavaFX:** Setup, stage, scene, nodes, layout panes.
* **JavaFX UI Controls:** Button, Label, TextField, TableView, ListView, ComboBox.
* **Event Handling and Animations:** Handling user events, timeline, transitions.

**JavaFX with FXML:** Separating UI and logic using FXML, Scene Builder.