



AMA COMPUTER ACADEMY JAVA SYLLABUS



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Java Syllabus

Topics	Sub-Topics
Introduction to Java	Why you should learn Java?
	Introduction to programming languages
	Installing Java Development Kit (JDK)
	JDK, JRE and JVM
	Importance of Java in the context of Internet
Features of Java	Features of Java
	Object Oriented Programming Paradigm (OOP)
	Relationship between classes and objects
	Features of OOPs - Encapsulation, Inheritance, Abstraction and Polymorphism
Data Types, Variables, Literals	Data types in Java - Integers, floating-point, characters, boolean
	Concept of variables, their declarations
	Literals - Integer, floating-point, character, boolean, strings
Let's dive into the Java coding	How to Write java code, compile and execute?
	First Java Program using Notepad
	Explanation of important terms like main(), public, void, static
	First Java Program using Netbeans
	Using Command Line arguments in Java program written in Notepad
	Using Command Line arguments in Java program written in Netbeans
Important options of Netbeans IDE	Introduction to IDEs
	Components of Netbeans
	Creating a project in Netbeans
	Exporting & importing projects
Reading the values of various data types	Reading values from keyboard using Scanner class object
	Tricks to prevent the skipping of String input value
	Implicit type casting
	Explicit type casting
Operators	Operators in Java
	Precedence and associativity of operators
	Examples of precedence and associativity
	Programs illustrating usage of arithmetic operators, relational operators, logical operators, unary operators, ternary operator
	Compound assignment operators
Programming building blocks (Control structures)	Programming Construct Sequence
	if statement
	if else if ladder
	Nested if
Switch case construct	Overview of switch case construct
	Difference between if and switch case

Iteration (Looping)	Basics of loops and while loop
	while loop pre-tested property
	Basics of do..while loop
	while loop post-tested property
	Basics of for loop
	for loop pre-tested property
	More features of for loop
	Infinite loops
	Using break statement
	Using continue statement
	Programs to find - Factorial, Reverse a number, Palindrome number, Armstrong number, Prime number, Biggest among n numbers
	Using for each format of the for loop
	break and continue statements with examples
	Nested while loop with examples
	Nested for loop with examples
Honing the programming skills using Loops	Programs - using loops
	Programs - using nested loops
The concept of Arrays	The basic concept of arrays
	Declaring an array dynamically using two methods
	Traversal of array elements
	Initialising array elements
Searching Techniques	Linear Search Logic and Algorithm
	Logic of Binary Search
	Algorithm of Binary search
	Programs - Linear Search and Binary search
Sorting Techniques	Logic of Bubble sort
	Algorithm of Bubble sort
	Logic of Selection sort
	Algorithm of Selection sort
	Programs - Bubble sort and Selection sort
Double dimensional (2-D) Arrays	Basics of double dimensional arrays
	Double dimensional arrays with different number of columns
	Matrix addition - logic and program
	Logic of matrix multiplication
	Algorithm and program of matrix multiplication
	Using sort method of Arrays class
Functions (Methods)	Basics of functions
	Developing Functions - with a practical approach
	Scope of variables in functions
	Some facts about return statement
	Passing an array to a function
Recursion	Recursion (Recursive functions)
Java coding for Classes and Objects	Practical coding of classes and objects
Method Overloading	Method Overloading (Compile-time polymorphism)

Constructors	Constructors in Java
	Default Constructors
	Constructor overloading
	this keyword
Getters and Setters	Basics of getters and setters
	Automatic creation of setter getter code
Static Members of a class	Static members of a class
Packages in Java	Basics of Packages
	Access specifiers (Visibility modes) in Java
	Understanding default and private members practically
	Package classes in different programs
	Working in different packages
	Usage of import keyword of Java
Method Signatures	Method signatures
Abstract Classes	Creating abstract classes
Interfaces in Java	The basics of interfaces
	Practical coding of interfaces
	An interface extending another interface
Inheritance	Introduction to Inheritance
	Syntax of applying Inheritance and Method overriding
	Multi-Level inheritance
Behaviour of Constructors in Inheritance	Behaviour of constructors in Inheritance
	Practical examples of constructors with and without arguments in inheritance
Using final keyword	Final classes
	Final methods
Storing reference of sub-class object into super class reference variable	Assigning reference of sub-class object into super class reference variable
Abstract Methods	Abstract methods
Polymorphism	Basics of Polymorphism
	Practical implementation of Polymorphism
Exception Handling	Basics of exception handling
	Uncaught exceptions
	Catching exceptions using try catch blocks
	Multiple catch blocks
	Calling a method from within try block
	Using super class Exception
	Handling NullPointerException
	Handling NumberFormatException
	throw: throwing an exception manually
	throws: handling checked exceptions
	Nested try block
Java Collection Framework	Basics of Collections and ArrayList traversal using Iterator interface
	Traversing ArrayList elements using for each loop
	Storing objects of user defined classes in collection

	Using toArray() method of ArrayList class
	LinkedList Collection
	ListIterator interface - Traversing collection elements in both directions
	Using sort method of Collections class
	Sorting user-defined objects
Strings in Java	Basics of strings in Java
	Important String class methods
Multithreading	Basics of Multithreading
	Implementing Runnable interface for Multithreading
	Extending Thread class for Multithreading
	Thread Names, Priorities, parent thread
	Method main as a thread
Anonymous Inner Classes & LAMBDA Expressions	Anonymous inner classes
	LAMBDA expressions
Basics of Databases & MySql	Introduction to DBMS & Databases
	Creating a Database and Table using MySql Workbench GUI
	Creating a Database and Table at command prompt
	Issuing SQL statements on Command prompt
JDBC (Java DataBase Connectivity)	Basics of JDBC
	Architecture of JDBC
	Coding JDBC program for SQL statement Select, Insert, Delete, Update
Streams in Java	Basics of streams
	Using BufferedReader and InputStreamReader classes
	Reading from a file
	Writing on a file
Java Applets	Basics of Java Applets
	Writing your first applet and understanding life cycle
	Working with colors and fonts
	Passing parameters to an applet
Applet Programming in NetBeans	First Applet in Netbeans
	Drawing figures
Event Handling in Applets	Basics of event handling
	Handling mouse events
AWT Controls	AWT Controls
	Using Fonts and Colors in AWT Controls
	Positioning AWT Controls by setBounds() method
Event Handling of AWT Controls	Handling Button events
	Handling Checkbox events
	Handling Radio button events
	Handling Scrollbar events
	Handling List events
Applet Form Projects - Using Palette Box	Example of an Applet form project

	Handling Button events through Applet forms
	Handling Checkbox events through Applet forms
	Handling Choice events through Applet forms
Frame Projects	Differences between Applets and Frames
	Example of a Frame
	Getting more comfortable - Example of a Frame
	Changing the Title and Size of a Frame window
	Changing the background color of a Frame window
Java Swings	Basics of Swings & differences from Applets
	Using setBounds() and setFonts() with swing controls
	Using JCheckBox class object
	Creating a tree structure using JTree class object
Event Handling in Java Swings	Handling events of JButton objects
	Handling events of JCheckBox object
	Handling events of JRadioButton objects
Swing Programs in Netbeans - Using JApplet project	Swing Program in Netbeans
	Using Swing controls in JApplet project
	Event Handling in JApplet
	Using JOptionPane class for message dialog boxes
Working with JApplet Form Projects	JApplet Form swing
	More stuff on JApplet Form swings
Working with JFrame Form Projects	Program of JFrame Project
	Working with DateChooser
	Creating a MenuBar - Menu objects, MenuItem Objects
	Handling Events of MenuItems
Introduction to Web Development	Requirements
	Introduction to web applications
	Installing Tomcat server
	Installing Eclipse IDE
	Connecting Eclipse to Tomcat
Let's dive into JSP programming	The very first program of JSP
	JSP Tags
	Implicit objects in JSP
	Request implicit object of JSP
	JSP tags practical examples
	Using import
	Including pages into a JSPpage
	Difference between jsp:forward and jsp:include
Using Java classes in JSP	Creating a class & using it in JSP program
Interacting with HTML forms	Reading data from Textboxes
	Alternative to getParameter() method
	Reading data from dropdown list
	Reading data from radio buttons (option buttons)
	Reading data from a single checkbox

	Reading data from a group of checkboxes
Sessions in JSP	Basics of session management
	Storing & retrieving from a session object
Cookies in JSP	Concepts of cookies
	Storing & retrieving cookies
	Working with multiple cookies
JSP standard tag library (JSTL)	Basic concepts of JSTL
	Using <c:set> & <c:out> JSTL tags
	Using <c:if> JSTL tag
	Using <c:forEach> JSTL tag
	Using <c:choose>, <c:when> & <c:otherwise> JSTL tags
JDBC in JSP - Learning the basics	Understanding DBMS, databases & tables etc.
	Getting familiar with JDBC API
	Steps for JDBC coding
	Downloading XAMPP for MySQL
	Alert ! Listen before you proceed
	Learning SQL
	How to create a database and tables using GUI in XAMPP
JDBC in JSP - coding part	Importing MySQL connector
	Executing SQL command select in JDBC code
	Displaying the rows in HTML table
	Executing SQL command insert in JDBC code
Introduction to Servlets	Basics of servlets
	Difference between servlets and JSP
	Introduction to important classes and interfaces
	First servlet Program - Reading from an HTML form
	Creating an HTML form within a servlet
	Dealing with numbers in servlets
Interaction between multiple pages	Introduction to RequestDispatcher interface
	Coding with RequestDispatcher interface
	Introduction to SendRedirect method and difference from forward method
	Coding with sendRedirect method
	Working with hidden fields
	URL rewriting
Cookies in Servlets	Introduction to cookies
	Writing and reading cookies
	Login and logout with cookies example
Sessions in Servlets	Introduction to sessions
	Writing and reading session objects
Context parameters and Config parameters	Introduction to ServletContext and ServletConfig interfaces
	Storing and retrieving a single context parameters
	Storing & retrieving multiple context parameters
	Storing & retrieving a single config parameter
	Storing & retrieving multiple config parameters

Java DataBase Connectivity (JDBC) with Servlets	JDBC code for select SQL statement
	JDBC code for insert SQL statement
	JDBC code for delete SQL statement



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