

**Course Description:** Students learn Java programming and how to develop Java applications using RAD V7. They learn the Java programming syntax, OO programming using Java, exception handling, file input/output, and servlets and JSPs. Students will develop and test Java applications using RAD V7.

**Who Should Attend:** This course is intended for programmers who are interested in adding Java to their skills.

**Prerequisites:** Students must be familiar with object-oriented principals and the concept of object-oriented programming.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Apply OOP principles.
- Design OO applications using abstraction, encapsulation, modularity and hierarchy.
- Use Java exceptions to guarantee graceful error recovery for your application.
- Create and use inner classes in programs.
- Perform input/output using Java.
- Create servlets and JavaServer Pages.
- Use RAD for Java application development.

### Course Outline:

#### The Agenda

Using RAD  
Java Basics  
Branching and Looping  
Arrays and Objects  
Advanced Class Concepts  
Exceptions  
Stream I/O  
Servlets  
Java Server Pages  
EJB Programming Overview  
JDK 1.4 Features

#### Introduction

History and Goals of Java  
Java Virtual Machine  
Garbage Collection

#### Overview and Migration

The WebSphere Family  
Eclipse Platform  
The WebSphere Studio Product Family  
Rational Web Developer  
Rational Application Developer  
Key Features in RAD v7  
WebSphere Studio Application Developer Integration Edition  
WebSphere Studio Enterprise Developer  
Views, Perspective and Editor Areas  
Basic Operations with RAD Views and Perspectives  
The Java Perspective  
The Debug Perspective  
Navigator View  
Package Explorer  
Outline View  
Task and Problems View  
Build and Validation  
Import and Export Project  
Templates and Code Completion  
Searching  
Setup Compiler Class Path  
JRE Switching  
Refactoring  
Changing Class, Method, and Variable Name  
Moving a Class to a Different Package  
Extracting Code to a Method  
Pull-up Method  
Migrating Workspace from WSAD v5.x  
Project Interchange Feature  
Migrating J2EE Applications

J2EE Migration Wizard

#### Java Basics

Comments and Blocks  
Semicolons and White Spaces  
Identifiers and Keywords  
Primitive Data Types  
Logical - boolean  
Textual - char and String  
Integral - byte, short, int, long  
Floating Point - float and double  
Understanding Objects  
Creating a New Type  
Declaring a Variable  
Creating an Object  
JVM Storage Areas  
Scope of a Variable  
Arithmetic Operators  
Using Arithmetic Operators  
Assignment Operators  
Logical Expressions  
Short-Circuit Logical Operators  
String Concatenation with +  
Bitwise Operators  
Ternary Operator  
Casting

#### Branching and Looping

Conditions  
The if Statement  
The if...else Statement  
Logical Operators and the if..else Statement  
The switch and while Statements  
The do...while Statement  
The for loop  
Break and Continue

#### Objects

OO Programming  
Creating a Data Type  
Class Members  
Methods  
Pass-by-Value  
The this keyword  
Data Hiding  
Encapsulation  
Overloading  
Constructing and Initializing Objects  
Constructors  
Invoking an Overloaded Constructor  
Default Constructor  
Inheritance  
Constructors Are Not Inherited  
Polymorphism

Conditions for Polymorphism  
The super Keyword  
The instanceof Operator  
Casting Objects  
Overriding  
Invoking Parent Class Constructors

#### Arrays

Arrays  
Declaring, Creating, and Accessing Arrays  
Initializing Array  
Multidimensional Arrays  
Copying Arrays

#### Advanced Class Concepts

Static Class Variables  
Class vs. Instance Variables  
Static Class Methods  
Static Initializers  
The final Keyword  
Abstract Classes  
Interface  
Access Modifiers  
Using == vs. equals()  
The toString() method  
Inner/Nested Classes  
Kinds of Inner Classes  
The Vector Class

#### Exceptions

What is an Exception?  
Benefits  
How to Work With Exception  
The try-catch-finally Statement  
Flow of Program Control  
Checked Exceptions  
Unchecked Exceptions  
Catching Multiple Exceptions  
Rethrowing Exceptions  
Exception Thrown by a Method  
The Exception Class  
Creating Exceptions

#### Stream I/O

File I/O  
The File Class  
Input Stream and Methods  
Output Stream and Methods  
DataInputStream & DataOutputStream  
FileInputStream & FileOutputStream  
FileInputStream Methods  
FileOutputStream

FileOutputStream/DataOutputStream  
FileInputStream/DataInputStream  
Reader and Writer  
Why use Reader and Writer ?

#### Servlet Basics

History - CGI  
Server Extension APIs  
Java Servlet  
Servlet Container  
Servlet Responsibilities  
J2EE and Servlet  
The Servlet Class  
The Servlet Container  
The Servlet API  
Life Cycle - Initialization, Processing and Destroy  
User Input  
Output to Client  
Servlet Error Handling  
Threading Issues  
Create a Servlet  
Code Servlet Methods  
The Web Deployment Descriptor  
Test the Servlet  
Debug Servlets in the RAD's WebSphere Test Environment

#### JSP Basics

JavaServer Pages  
JSP Benefits  
Evolution of Dynamic Content Technologies  
How JSP Works  
JSP Invocation  
Create, Edit, and Test a JSP with RAD  
Debugging a JSP with RAD  
JSP Scripting Elements  
Directives  
XML Vs. Non-XML Syntax  
Creating a JSP in RAD(XML Syntax)  
Creating a JSP in RAD  
Adding code to JSP  
Viewing the output page Directive Attributes  
page Attribute - errorPage  
page Attribute - isErrorPage  
Directives - include  
Include at compile time vs. at request time  
Request time inclusion  
Forwarding Requests  
JSP Declarations, Expressions, and Scriptlets

JSP Comments  
JSP Implicit Objects  
The request, response, and out Objects

#### EJB Overview

Needs for EJB  
Distributed Computing, Transaction, and Security  
Main Characteristics of EJBs  
EJB Remote Method Call  
EJB Architecture Components  
EJB Client, JAR File, and Server  
EJB Container - Persistence and Transaction  
Enterprise Java Beans  
Session and Entity Beans  
Message-Driven Beans  
EJB Classes and Interfaces  
Basic Components of Entity and Session Beans  
EJB Home Interface  
EJBHome Object  
EJB Remote Interface  
EJB Local Home Interface  
EJB Local Interface  
Remote EJB Objects  
Local EJB Objects  
EJB Implementation Class  
EJB Container - Relationships  
Remote v. Local EJBs  
EJB Application Development  
Deploying Enterprise Beans  
Major Components of Deployed EJBs

#### JDK 1.4 Features

JDK 1.4 and WebSphere v5.1.x  
Migrating Specific Projects to Use JDK 1.4  
Globally Migrating to JDK 1.4  
JDK 1.4 - New Features  
Control Flow of Logging  
Loggers  
Logging API - Handlers  
Logging API - Formatters & Log Manager  
JDK 1.4 - JAXP  
JDK 1.4 - Assertions  
When to use Assertions  
Enabling Assertions