

## PROGRAMMING WITH OBJECTS

<b>III Semester: CSE / IT / CSIT / CSE(DS)</b>								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
AITC02	Core	3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: Nil</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>			
<b>Prerequisites: Programming for Problem Solving</b>								
<b>LCOURSE OVERVIEW:</b>								
<p>Java's unique architecture enables programmers to develop a single application that can run across multiple platforms seamlessly and reliably. This course, enable the students to gain extensive experience with Java and its object-oriented features to create robust console and GUI applications and store and retrieve data from relational databases.</p>								
<b>II. OBJECTIVES:</b>								
<b>The students will try to learn:</b>								
<ol style="list-style-type: none"> <li>I. The concepts of Object Oriented programming.</li> <li>II. The programs to implement event handling, user interfaces and graphical interfaces with the help of Java.</li> <li>III. The web applications to connect with the databases.</li> </ol>								
<b>III. SYLLABUS:</b>								
<b>MODULE-I: OOP CONCEPTS AND JAVA PROGRAMMING(08)</b>								
<p>OOP concepts: Classes and objects, data abstraction, encapsulation, inheritance, benefits of inheritance, polymorphism, procedural and object oriented programming paradigm; Java programming: History of java, comments data types, variables, constants, scope and life time of variables, operators, operator hierarchy, expressions, type conversion and casting, enumerated types, control flow statements, jump statements, simple java standalone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, exploring string class.</p>								
<b>MODULE –II: INHERITANCE, INTERFACES AND PACKAGES(10)</b>								
<p>Inheritance: Inheritance hierarchies, super and subclasses, member access rules, super keyword, preventing inheritance: final classes and methods, the object class and its methods; Polymorphism: Dynamic binding, method overriding, abstract classes and methods; Interface: Interfaces vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface; Packages: Defining, creating and accessing a package, understanding CLASSPATH, importing packages.</p>								
<b>MODULE –III: EXCEPTION HANDLING AND MULTI THREADING(08)</b>								
<p>Exception Handling: Benefits of exception handling, the classification of exceptions, exception hierarchy, checked and unchecked exceptions, usage of try, catch, throw, throws and finally, re-throwing exceptions, exception specification, built in exceptions, creating own exception sub classes.</p> <p>Multithreading: Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.</p>								
<b>MODULE –IV: FILES, AND CONNECTING TO DATABASE(10)</b>								
<p>Files: Streams, byte streams, character stream, text input/output, binary input/output, random access file operations, file management using file class; Connecting to Database: Connecting to a database, querying a database and processing the results, updating data with JDBC.</p>								
<b>MODULE –V: GUI PROGRAMMING AND APPLETS(09)</b>								
<p>GUI programming with Java: The AWT class hierarchy, introduction to swing, swing Vs AWT, hierarchy for swing components, containers, JFrame, JApplet, JDialog, JPanel; Overview of some swing components: JButton, JLabel, JTextField, JTextArea, simple applications; Layout management: Layout manager types: Border, grid and</p>								

flow; Applets: Inheritance hierarchy for applets, differences between applets and applications, life cycle of an applet, passing parameters to applets.

#### **IV. Text Books:**

1. Herbert Schildt, Dale Skrien, "Java Fundamentals – A Comprehensive Introduction", McGraw-Hill, 1<sup>st</sup> Edition, 2013.
2. Herbert Schildt, "Java the Complete Reference", McGraw Hill, Osborne, 8<sup>th</sup> Edition, 2011.
3. T. Budd, "Understanding Object-Oriented Programming with Java", Pearson Education, Updated Edition (New Java 2 Coverage), 1999.

#### **V. Reference Books:**

1. P.J. Deitel, H. M. Deitel, "Java: How to Program" , Prentice Hall, 6<sup>th</sup> Edition, 2005.
2. P. RadhaKrishna, "Object Oriented Programming through Java", Universities Press, CRC Press, 2007.
3. Bruce Eckel, "Thinking in Java", Prentice Hall, 4<sup>th</sup> Edition, 2006.
4. Sachin Malhotra, Saurabh Chaudhary, "Programming in Java", Oxford University Press, 2<sup>nd</sup> Edition, 2014.

#### **VI. Web References:**

1. <http://www.javatpoint.com/java-tutorial>
2. <http://www.javatutorialpoint.com/introduction-to-java/>