

PROGRAMMING WITH OBJECTS

III Semester: CSE / IT / CSIT / CSE(DS)																										
Course Code	Category	Hours / Week			Credits	Maximum Marks																				
AITC02	Core	L	T	P	C	CIA	SEE	Total																		
		3	0	0	3	30	70	100																		
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45																					
Prerequisites: Programming for Problem Solving																										
<p>I. COURSE OVERVIEW: This course presents the principles of object oriented programming using the Java language, one of the most increasingly preferred languages for programming today. The knowledge gained in this course can be applied later to other languages such as python, C++. This course uses Net beans IDE to afford a more interactive experience. This course helps to develop different applications in various domains like GUI Applications, Big Data, Web-based Applications, etc..</p>																										
<p>II. OBJECTIVES: The students will try to learn:</p> <ul style="list-style-type: none"> I The basic concepts and principles of object oriented programming. II The object oriented features to develop the robust applications and database connectivity. III The Graphical User Interface (GUI) with multithreading concepts to develop real world applications on different platforms. 																										
<p>III. COURSE OUTCOMES: After successful completion of the course, students should be able to:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">CO 1</td> <td style="width: 70%;">Demonstrate object oriented programming concepts that helps to organize complex problems solving.</td> <td style="width: 20%;">Understand</td> </tr> <tr> <td>CO 2</td> <td>Make use of the programming constructs like control Structures, arrays, parameter passing techniques and constructors to solve the real time problems.</td> <td>Apply</td> </tr> <tr> <td>CO 3</td> <td>Utilize the abstraction, encapsulation and polymorphism Techniques to solve different complex problems.</td> <td>Apply</td> </tr> <tr> <td>CO 4</td> <td>Experiment all threading and thread synchronization problems in soft real time systems.</td> <td>Apply</td> </tr> <tr> <td>CO 5</td> <td>Make use of inheritance, interfaces, packages and files to implement reusability in soft real time systems.</td> <td>Analyze</td> </tr> <tr> <td>CO 6</td> <td>Construct GUI based applications along with Exception handling using AWT, Swing and Applets with JDBC connectivity.</td> <td>Apply</td> </tr> </table>									CO 1	Demonstrate object oriented programming concepts that helps to organize complex problems solving.	Understand	CO 2	Make use of the programming constructs like control Structures, arrays, parameter passing techniques and constructors to solve the real time problems.	Apply	CO 3	Utilize the abstraction, encapsulation and polymorphism Techniques to solve different complex problems.	Apply	CO 4	Experiment all threading and thread synchronization problems in soft real time systems.	Apply	CO 5	Make use of inheritance, interfaces, packages and files to implement reusability in soft real time systems.	Analyze	CO 6	Construct GUI based applications along with Exception handling using AWT, Swing and Applets with JDBC connectivity.	Apply
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<p>IV. SYLLABUS: MODULE-I: OOP CONCEPTS AND JAVA PROGRAMMING(08) 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>																										
<p>MODULE –II: INHERITANCE, INTERFACES AND PACKAGES(10) 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>																										
<p>MODULE –III: EXCEPTION HANDLING AND MULTI THREADING(08) 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>																										

Multithreading: Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

MODULE –IV: FILES, AND CONNECTING TO DATABASE(10)

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.

MODULE –V: GUI PROGRAMMING AND APPLETS(09)

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

V. Text Books:

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

VI. Reference Books:

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

VII. Web References:

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