ITA5004	Object Oriented Programming using JAVA	L	T	P	J	C
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Pre-requisite	**Nil**	**Syllabus version**				
		v. 1.0				

Course Objectives:

1. Comprehending basic and object oriented concepts in java& libraries of java.
2. Applying learnt concepts and developing various approaches to solve problems.
3. Designing and building real-time applications with an event-driven graphical userinterface accessing files or database.
4. Introducing the concept of web technologies in java - RMI and Servlets.

Expected Course Outcomes:

1. Ability to familiarize with core object oriented concepts in Java.
2. Apply inheritance and interface concepts in java to solve problems
3. Recognize exceptions and parallel threads in real world problems and solve them with appropriate provisions.
4. Design GUI with Applets and Swings.
5. Design appropriate back end support for an application using file-processing or JDBC.
6. Analyse Generic classes and Collections interfaces that help solve problems using different data structures.
7. Develop web-based solutions using RMI and Servlets.
8. Practise all the concepts of Java and apply appropriate techniques to a specific problem domain.

Student Learning Outcomes (SLO)	**2, 7, 9**	
Module:1	**Introduction**	**4 hours**
Classes & Objects – Overloading Methods – Passing and returning objects – Controlling access to members – this, static, and final keywords , String handling		
Module:2	**Inheritance & Packages**	**3 hours**
Inheritance – Types of Inheritance - Method Overriding, Dynamic Method Dispatch – Abstract classes - Interfaces, Packages – Access Specifiers – importing packages		
Module:3	**Exception Handling and Multithreading**	**4 hours**
Exception handling Model – Built in exceptions – User defined exceptions. Multithreading-Thread creation - Thread class - Runnable interface.		
Module:4	**GUI in Java**	**5 hours**
Applet Programming, AWT Programming, Event handling – Swing Components.		
Module:5	**Files & JDBC**	**4 hours**
FILE class – Its Methods; I/O Streams- Byte Stream and Character Stream classes - Random Access file. JDBC Statement - Callable and Prepared object – Processing Result set.		
Module:6	**Generics & Collections**	**4 hours**

Generic methods, generic classes – Collection Interfaces - Collection Classes - Collection Algorithms.		
Module:7	**RMI & Servlets**	**4 hours**
RMI – creating stubs, skeleton – Remote Method Invocation; Servlets – Life Cycle – Client Request - Accessing Form Data – database access.		
Module:8	**Contemporary issues**	**2 hours**
Expert Talk		
	Total Lecture hours:	**30 hours**

Text Book(s)		
1.	Deitel and Deitel, Java How to Program (late objects), 2015, 10th Edition, Prentice Hall.	
Reference Books		
1.	Herbert Schildt, Java™: The Complete Reference, 2014, 9th Edition, Oracle Press.	
2.	Eric Jendrock, Ricardo Cervera-Navarro, Ian Evans,KimHaase, William Markito, Java EE 7Tutorial, 2014, 5th Edition, Prentice Hall.	
3.	E. Balaguruswamy, Programming With Java: A Primer, 2012, 3rd Edition, The McGraw Hill.	
List of Challenging Experiments		
1.	Programs on Control Flow – Decision Making, Branching and Looping	2 hours
2.	Program designs on OOP in Java – Classes & Objects, Method Overloading, Inheritance, Dynamic Method Dispatch, Interfaces.	2 hours
3.	Programs with packages	2 hours
4.	Programs on String handling (Use classes String and String Buffer)	2 hours
5.	Programs on Exception Handling	2 hours
6.	Programs on Files and I/O Streams	2 hours
7.	JDBC Programs	2 hours
8.	Programs on Networking (both TCP/IP and UDP)	2 hours
9.	Applet Programming (Including Event Handling)	2 hours
10.	GUI Design with AWT and Swing (Including Event Handling)	2 hours
11.	Program to invoke functions on a remote system.	2 hours
12.	Auto page refresh using Servlets.	2 hours
13.	A small airline has just purchased a computer for its new automated reservations system. You've been asked to develop the new system. You're to write an application to assign seats on each flight of the airline's only plane (capacity: 10 seats). Your application should display the following	2 hours

	alternatives: Please type 1 for First Class and Please type 2 for Economy. If the user types 1, your application should assign a seat in the first-class section (seats 1–5). If the user types 2, your application should assign a seat in the economy section (seats 6–10). Your application should then display a boarding pass indicating the person's seat number and whether it's in the first-class or economy section of the plane. Use a one-dimensional array of primitive type Boolean to represent the seating chart of the plane. Initialize all the elements of the array to false to indicate that all the seats are empty. As each seat is assigned, set the corresponding element of the array to true to indicate that the seat is no longer available. Your application should never assign a seat that has already been assigned. When the economy section is full, your application should ask the person if it's acceptable to be placed in the first-class section (and vice versa). If yes, make the appropriate seat assignment. If no, display the message "Next flight leaves in 3 hours"	
14.	Net Banking Application – Object based concepts, Networking, JDBC, JSF/Swing	2 hours
15.	Cryptography schemes for encoding of secret image/text – Object based concepts, Networking,	
16.	Chat for Multiuser - Object based concepts, Networking, JSF/Swing	2 hours
17.	Data mining algorithms to analyse medical data – Files, Collection framework, AWT/Swing	
	Total Laboratory Hours	30 hours

Recommended by Board of Studies	05-03-2016		
Approved by Academic Council	40th	Date	18-03-2016