Syllabus for Bachelor of Technology

Computer Engineering-AI

Subject Code: 01AI0401

Subject Name: Java Programming

B.Tech. Year - II

Objective:

Java is a computer programming language having features like object- oriented, polymorphism, inheritance and multithreading. It comprises of large third-party library using which we can develop software.

Credits Earned: 4 Credits

Course Outcomes: After completion of this course, student will be able to:

- To understand object-oriented programming concepts and implement them in java. (Understand)
- To comprehend building blocks of OOPs language, inheritance, package and interfaces. (Understand)
- To identify exception handling methods. (Apply)
- To implement multithreading in object-oriented programs. (Apply)
- To develop GUI based desktop applications in project-based learning. (Create)

Prerequisite: NA

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term work (TW)	
3	0	2	4	50	30	20	25	25	150

Contents:

Unit	Topics	Contact Hours
1	**Java Overview** Java Introduction, Platform Independence, JVM & JDK, Data types, Operators, If, else statement, Switch condition, while, do-while, for loop, break and continue statement.	3
2	**Array, String and Collection Classes** Single Array & Multidimensional Array, Library Classes-String, String Buffer & Wrapper Class, Command line arguments and Various String Operations. List Class (Abstract List), Array List class, LinkedList class, Enumeration Iterative Statement, Vector class.	6
3	**Classes, Objects and Methods** Class and Object, Object reference, Constructor: Constructor Overloading, Method: Method Overloading, Recursion, Passing and Returning object form Method, new operator, this and static keyword, finalize() method, Import statement, Static import, Access control, Nested class, Inner class, Anonymous inner class.	8
4	**Inheritance and Interfaces in Java** Overview of Inheritance, inheritance in constructor, Inheriting Data members and Methods, Multilevel Inheritance – method overriding Handle multilevel constructors Explain super keyword, Stop Inheritance ,Explain Final keywords, Creation and Implementation of an interface, Interface reference, instance of operator, Interface inheritance, Dynamic method dispatch, Abstract class, Comparison between Abstract Class and interface, inside of System.out.println – statements.	8
5	**Multithreading, Exception and File Handling in Java** Introduction of Multithread programming, Thread classes and Runnable interface, Thread priority and synchronization, Thread communication and Deadlock. Exception and Error, Use of try, catch, throw, throws and finally, Built in Exception, Custom exception, Throwable Class. Overview of Different Stream (Byte Stream, Character stream), Readers and Writers class, File Class, File Input Stream, File Output Stream, Input Stream Reader and Output Stream Writer class, File reader and writer class, File Writer, Buffered Reader class.	12
6	**Swing** Introduction To Swing, Applications and Pluggable look and feel, Basic swing components : Text Fields, Buttons, Toggle Buttons, Checkboxes, and Radio Buttons. Event Handling: various event handling mechanisms, Delegation Event Model, Events, Event Sources, Event Listeners, various classes related to event sources and event listeners.	6
	Total Hours	**43**

Reference Books:

1. Intro to Java Programming, 10th edition, Y.Daniel Liang, Pearson
2. Java 7 Programming Black Book by Kogent Learning Solutions Inc,DreamTech press
3. Programming with Java A Primer – E. Balagurusamy, McGraw Hill
4. The Complete Reference, Java 2 (Fourth Edition), Herbert Schild, - TMH.
5. Core Java Volume-I Fundamentals Horstmann & Cornell, - Pearson Education. - Eight Edition

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve an effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyse	Evaluate	Create
10%	25%	50%	15%	0%	0%

Suggested List of Experiments:

At least 12 practicals are to be completed which will be taken in consideration for evaluation purpose too.

Instructional Method:

a. The course delivery method will depend upon the requirement of content and the needs of students. The teacher, in addition to conventional teaching methods, may also use any tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

c. Practical examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.

d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resource:

1. http://docs.oracle.com/javase/tutorial/java/index.html
2. http://www.javatpoint.com/
3. http://www.tutorialspoint.com/java/
4. http://www.learnjavaonline.org/
5. http://www.c4learn.com/javaprogramming/
6. http://www.learn-java-tutorial.com/