

COURSE NAME : COMPUTER ENGINEERING GROUP
COURSE CODE : CO/CM/IF/CD
SEMESTER : FIFTH FOR CO/CM AND SIXTH FOR CD
SUBJECT TITLE : JAVA PROGRAMMING
SUBJECT CODE : 9113

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	04	03	80	20	50#	--	25@	175

Rationale:

Java language enhances and refines the object oriented paradigm. Essential to adapt to refinements and improvements in the art of programming. Java supports development of dynamic network based applications, which are secured, reliable, portable, extensible and reusable. This subject knowledge is essential for development of customized and web based applications. Java being platform independent language and a freeware software, the major business applications world wide being based on Java technology, learning Java becomes essential.

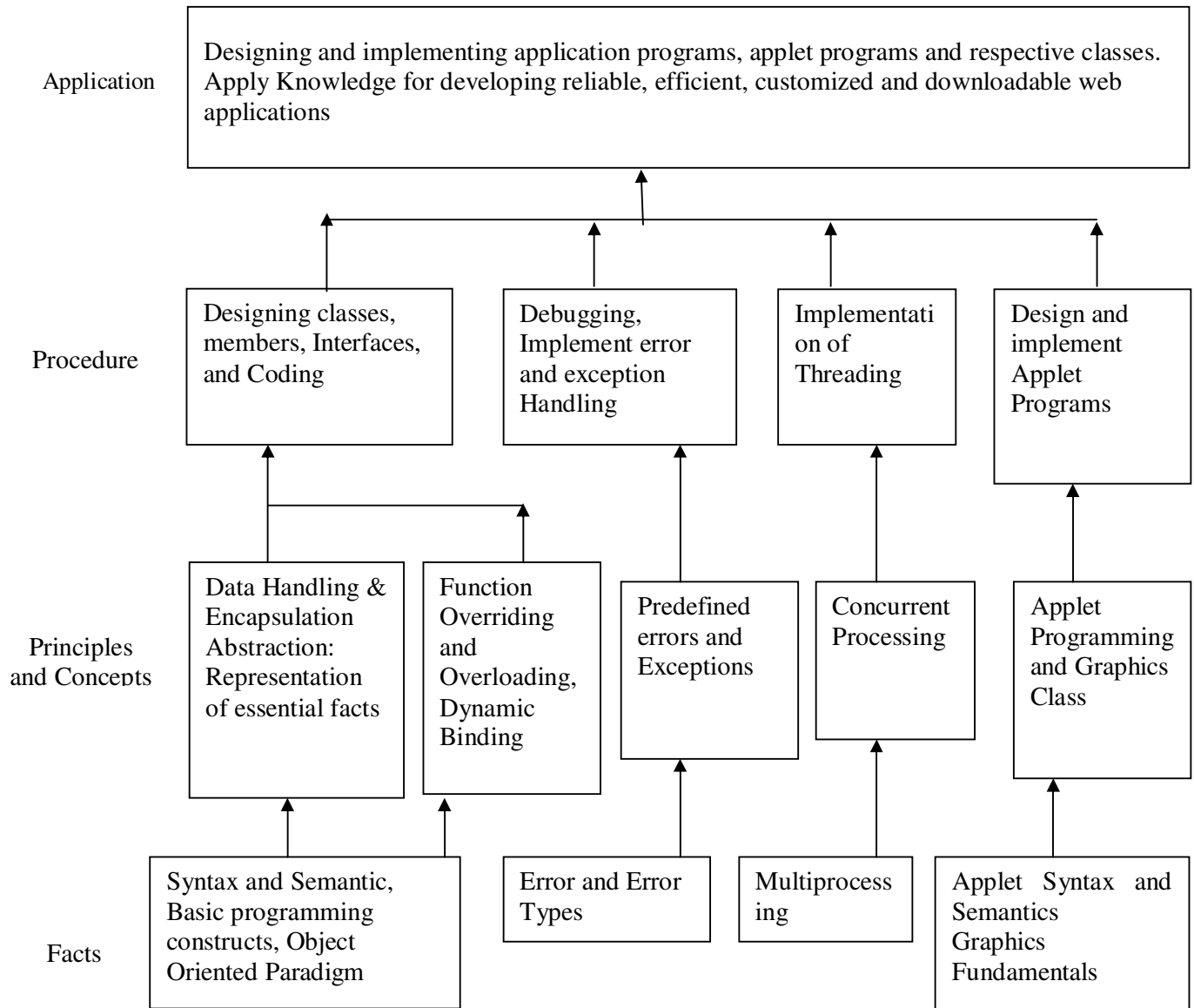
Further this subject, which includes learning core java forms a foundation for learning Advanced java.

Objective:

The student will be able to:

1. Design and implement classes and methods
2. Understand and implement basic programming constructs
3. Apply object oriented features to real time entities
4. Differentiate between primitive data types and class data types and implement conversion between them.
5. Understand and implement the concept of reusability and extensibility
6. Create packages and interfaces and used it in programs
7. Design and implement multithreaded programs
8. Manage errors and exceptions
9. Design and implement applet and graphics programming
10. Make use of Data streams in programs
11. Write programs by combining all features of Java.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	Introduction to Java 1.1 Fundamentals of Object Oriented Programming Object and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding 1.2 Java Features Compiled and Interpreted, Platform independent and portable, Object oriented Distributed, Multithreaded and interactive, High performance 1.3 Constant, Variables and Data Types Constant, Data Types, Scope of variable, Symbolic Constant, Type casting, Standard default values 1.4 Operator and Expression Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operator Increment and Decrement Operator, Conditional Operator, Bit wise Operator, Special Operator 1.5 Decision making and Branching Decision making with if statement, Simple if statement, The if else statement, The else if ladder, The switch statement, The? : Operator 1.6 Decision making and Looping The While statement, The do statement, The for statement, Jumps in Loops, Labeled Loops	10	16
02	2.1 Classes, Object and Methods Defining a class, Creating object, Accessing class members, Constructor, Methods Overloading, Static Member 2.2 Inheritance Extending a Class (Defining a subclass Constructor, Multilevel inheritance, Hierarchical inheritance, Overriding Methods, Final variable and Methods, Final Classes, Abstract method and Classes 2.3 Visibility Control Public access, friend access, Protected access, Private access, Private Protected access 2.4 Array, Strings and Vectors Arrays, One Dimensional array, Creating an array, Two Dimensional array, Strings, Vectors, Wrapper Classes	08	16
03	Interfaces and Packages 3.1 Interface: Multiple Inheritance Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variable 3.2 Packages: Putting Classes Together System Package, Using system Package, Naming Convention, Creating Package, Accessing a package, Using a package, adding a class to a package	06	16
04	Multithreaded Programming and Exception handling 4.1 Multi Threading: Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread, Using thread method, Thread exceptions, Thread priority, Synchronization, Implementing a 'Runnable' Interface	08	16

	4.2 Managing Errors and Exceptions Types of errors, Exception, Multiple catch statement, using finally statement, Using Exception for Debugging		
05	Java Applets and Graphics Programming 5.1 Applet Programming Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle, Creating an Executable Applet, Designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet, Passing parameter to applet 5.2 Graphics Programming The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, Using control loops in Applets, Drawing Bar charts	10	12
06	Streams and File I/O 6.1 Stream Classes 6.2 Character Stream, Byte Stream 6.3 Serialization	06	04
Total		48	80

Practical:

Skills to be developed:

Intellectual skills:

- Use of programming language constructs in program implementation.
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem
- Study different types of errors as syntax semantic, fatal, linker & logical
- Debugging of programs
- Understanding different steps to develop program such as
 - Problem definition
 - Analysis
 - Design of logic
 - Coding
 - Testing
 - Maintenance (Modifications, error corrections, making changes etc.)

Motor skills:

- Proper handling of Computer System.

Sr. No.	List of Practicals
1.	Write simple programs based on basic syntactical constructs of Java like: a) Operators and expressions. b) Looping statements. c) Decision making statements. d) Type casting.
2.	Write a simple Java program to demonstrate use of command line arguments in Java..
3.	Write a Java Program to define a class, describe its constructor, overload the constructors and instantiate its object
4.	Write a Java Program to define a class, define instance methods for setting and retrieving values of instance variables and instantiate its object
5.	Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation.
6.	Write a Java Program to demonstrate use of sub class
7.	Write a Java Program to demonstrate use of nested class.
8.	Write a Java Program to practice - use of single Dimensional array. - use of multidimensional array.
9.	Write a Java Program to implement array of objects.
10.	Write a Java program to practice - using String class and its methods. - using String Buffer class and its methods.
11.	Write a Java Program to implement Vector class and its methods.
12.	Write a Java Program to implement Wrapper classes and their methods.
13.	Write a Java Program to implement single inheritance by applying various access controls to its data members and methods.
14.	Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.
15.	Write a Java Program to implement inheritance and demonstrate use of method overriding.
16.	Write a program to demonstrate - use of implementing interfaces. - use of extending interfaces.
17.	Write a Java program to implement the concept of importing classes from user defined package and creating packages.
18.	Write a program to implement the concept of threading.
19.	Write a program to implement the concept of Exception Handling - using predefined exception. - by creating user defined exceptions.
20.	Write a program to implement the concept of Synchronization for - object synchronization. - method synchronization.
21.	Write a program using Applet - to display a message in the Applet. - for configuring Applets by passing parameters.
22.	Write programs for using Graphics class - to display basic shapes and fill them. - draw different items using basic shapes - set background and foreground colors.
23.	Write program to demonstrate use of I/O streams.
24.	Write program to demonstrate use of File streams.

Learning Resources:

1. Books:

Sr. No.	Author	Title	Publisher
01	E. Balagurusamy	Programming with Java	BPB
02	C Thomas WU	An Introduction to Object Oriented Programming	Tata McGraw Hill
03	Patrick Naughton-Herbert Schildt	The Complete Reference Java 2 (Third Edition)	Tata McGraw Hill
04	John R.Hubbard	Programming with Java	Tata McGraw Hill
05	Cohoon & Davidson	Java Program design	Tata McGraw Hill
06	Jawroski	Java2 Unleashed	Techmedia
07	Java2 Programming	Keyur Shah	Tata McGraw Hill

Notes: LCD has to be used for effective learning for all the topics.

1) Web Sites:

<http://www.sun.java.com>

<http://www.osborne.com>

<http://www.sun.java.com> (For downloading JDK for Practical)