GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Diploma Engineering	Branch	Computer Engineering
Semester	V	Version	1.0.0.0
Effective from Academic Year	2020-21	Effective for the batch Admitted in	JULY 2018
Subject code	1CE2503	Subject Name	JAVA PROGRAMMING

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	2	0	5	Theory	40	60	100
Hours	3	0	4	0	7	Practical	60	40	100

Pre-requisites:
Basic knowledge of Object-oriented concept

Course Learning Outcomes:
The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes. T1 Explain object-oriented programming concepts of java. T2 Comprehend building blocks of OOPs language, inheritance, package and interfaces. T3 Identify exception handling methods. T4 Develop multithreading object-oriented programs. T5 Develop an object-oriented program handling data file.

Course Content				
Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
UNIT – 1 Introduction to Java	1.1 Basics of Java, Background/History of Java, Java and the Internet, Advantages of Java 1.2 Java Virtual Machine & Byte Code 1.3 Java Environment Setup 1.4 Java Program Structure 1.5 Procedure-Oriented vs. Object-Oriented Programming concept 1.6 Basics of OOP: Abstraction, Inheritance, Encapsulation, Classes, subclasses and super classes, Polymorphism and Overloading, message communication	1a.Describe Internet role, advantages and, environment setup of Java. 1b. Differentiate between POP and OOP 1c.List important OOP fundamental 1d. Write simple programs using java	10	04

	1.7 Compiling and running a simple "Hello World" program: Setting Up Your Computer, Writing a Program, Compiling, Interpreting and Running the program, Common Errors			
UNIT – 2 Building Blocks of the Language	2.1 Primitive Data Types : Integers, Floating Point type, Characters, Booleans etc 2.2 User Defined Data Type 2.3 Identifiers & Literals 2.4 Declarations of constants & variables 2.5 Type Conversion and Casting 2.6 Scope of variables & default values of variables declared 2.7 Wrapper classes 2.8 Comment Syntax 2.9 Garbage Collection 2.10 Arrays of Primitive Data Types 2.11 Types of Arrays 2.12 Creation, concatenation and conversion of a string, changing case of string, character extraction, String Comparison, String Buffer 2.13 Different Operators: Arithmetic, Bitwise, Rational, Logical, Assignment, Conditional, Ternary, Increment and Decrement, Mathematical Functions 2.14 Decision & Control Statements: Selection Statement (if, if...else, switch), Loops (while, do-while, for), Jump statements (break, continue, return & exit)	2a. Explain Data types: constant and variables 2b. State the steps to implement programs for Arrays and String Handling 2c. List different types of operators 2d. State the steps to implement small programs using Decision & Control Structures	10	08
UNIT – 3 Object Oriented Programming Concepts	3.1 Defining classes, fields and methods, creating objects, accessing rules, this keyword, static keyword, method overloading, final keyword, 3.2 Constructors: Default constructors, Parameterized constructors, Copy constructors, Passing object as a parameter, constructor overloading	3a. Define Objects and Classes and methods 3b.Explain Constructors & its types, Object as a parameter, constructor overloading	10	06

UNIT – 4 Inheritance, Packages & Interfaces	4.1 Basics of Inheritance, Types of inheritance: single, multiple, multilevel, hierarchical and hybrid inheritance, concepts of method overriding, extending class, super class, subclass, dynamic method dispatch & Object class 4.2 Creating package, importing package, access rules for packages, class hiding rules in a package. 4.3 Defining interface, inheritance on interfaces, implementing interface, multiple inheritance using interface 4.4 Abstract class and final class	4a. Describe Inheritance and method overriding 4b. List the types of Inheritance 4c. Describe Creating package, importing package, access rules for packages, class hiding rules in a package 4d. Define interface. 4e. Explain inheritance on interfaces, implementing interface, multiple inheritance using interface 4f.Describe Abstract & final classes	10	10
UNIT – 5 Exception Handling & Multithreaded Programming	5.1 Types of errors, exceptions, try..catch statement, multiple catch blocks, throw and throws keywords, finally clause, uses of exceptions, user defined exceptions 5.2 Creating thread, extending Thread class, implementing Runnable interface, life cycle of a thread, Thread priority & thread synchronization, exception handing in threads	5a. Explain errors, & exceptions 5b. List types of errors 5c. Define thread, creating threads, multithreading, thread priority & synchronization	12	10
UNIT – 6 File Handling	6.1 Stream classes, class hierarchy, useful I/O classes, creation of text file, reading and writing text files	6a. Explain basics of streams, stream classes, creation, reading and writing files in context to file handling	08	07

List of Practical

No.	Unit	Name of Practical
1	1	Install JDK, write a simple “Hello World” or similar java program, compilation, debugging, executing using java compiler and interpreter
2	1	Write a program in Java to generate first n prime numbers
3	2	Write programs in Java to use Wrapper class of each primitive data types
4	2	Write a program in Java to multiply two matrixes
5	3	Write a program in Java to demonstrate use of this keyword. Check whether this can access the private members of the class or not
6	3	Write a program in Java to develop overloaded constructor. Also develop the copy constructor to create a new object with the state of the existing object

7	4	Write a program in Java to demonstrate single inheritance, multilevel inheritance and hierarchical inheritance
8	4	Describe abstract class called Shape which has three subclasses say Triangle, Rectangle, Circle. Define one method area()in the abstract class and override this area() in these three subclasses to calculate for specific object i.e. area() of Triangle subclass should calculate area of triangle etc. Same for Rectangle and Circle
9	5	Write a program in Java to develop user defined exception for 'Divide by Zero' error.
10	5	Write a program in Java to demonstrate the use of synchronization of threads when multiple threads are trying to update common variables.
11	5	Write a program that executes two threads. One thread displays “Thread1” every 2,000 milliseconds, and the other displays “Thread2” every 4,000 milliseconds. Create the threads by extending the Thread class.
12	6	Write a program in Java to create, write, modify, read operations on a Text file.

List of Instruments / Equipment / Trainer Board	
1	JDK Latest Version
2	Editplus
3	Notepad++
4	Neatbeans

List of Textbooks			
No	Title of Textbooks	Authors	Publication
1	Java: The Complete Reference, Seventh Edition	Herbert Schildt	Tata McGraw Hill
2	Programming with Java	E Balagurusamy	Tata McGraw Hill

Link of Learning Web Resource	
1	www.javapoint.com
2	www.studytonight.com
3	www.tutorialpoint.com