SHORT SYLLABUS

BCSE103E Computer Programming: Java
3 Credits (1-0-4)
Basics of Object-Oriented Programming. Java basic constructs and data types. Looping and Arrays. Classes and Objects. Inheritance and Polymorphism. Packages and Exception Handling. Files and IO Streams. Collection Framework.

BCSE103E	Computer Programming : Java	L	T	P	C
		1	0	4	3
Pre-requisite	**NIL**	**Syllabus version**			
		1.0			

Course Objectives:

1. To introduce the core language features of Java and understand the fundamentals of Object -Oriented programming in Java.
2. To develop the ability of using Java to solve real world problems.

Course Outcome:

At the end of this course, students should be able to:

1. Understand basic programming constructs; realize the fundamentals of Object Orientated Programming in Java; apply inheritance and interface concepts for enhancing code reusability.
2. Realize the exception handling mechanism; process data within files and use the data structures in the collection framework for solving real world problems.

Module:1	**Java Basics**	**2 hours**

OOP Paradigm - Features of Java Language - JVM - Bytecode - Java program structure – Basic programming constructs - data types - variables – Java naming conventions – operators.

Module:2	**Looping Constructs and Arrays**	**2 hours**

Control and looping constructs - Arrays – one dimensional and multi-dimensional – enhanced for loop – Strings - Wrapper classes.

Module:3	**Classes and Objects**	**2 hours**

Class Fundamentals – Access and non-access specifiers - Declaring objects and assigning object reference variables – array of objects – constructors and destructors – usage of “this” and “static” keywords.

Module:4	**Inheritance and Polymorphism**	**3 hours**

Inheritance – types –- use of “super” – final keyword - Polymorphism – Overloading and Overriding - abstract class – Interfaces.

Module:5	**Packages and Exception Handling**	**2 hours**

Packages: Creating and Accessing - Sub packages.
Exception Handling - Types of Exception - Control Flow in Exceptions - Use of try, catch, finally, throw, throws in Exception Handling - User defined exceptions.

Module:6	**IO Streams and Files**	**2 hours**

Java I/O streams – FileInputStream & FileOutputStream – FileReader & FileWriter- DataInputStream & DataOutputStream – BufferedInputStream & BufferedOutputStream – PrintOutputStream - Serialization and Deserialization.

Module:7	**Collection Framework**	**2 hours**

Generic classes and methods - Collection framework: List and Map.

	Total Lecture hours:	**15 hours**

Text Book(s)

1.	Y. Daniel Liang, “Introduction to Java programming” - comprehensive version-11th Edition, Pearson publisher, 2017.

Reference Books

1.	Herbert Schildt , The Complete Reference -Java, Tata McGraw-Hill publisher, 10th Edition, 2017.
2	Cay Horstmann,”Big Java”, 4th edition, John Wiley & Sons publisher, 5th edition, 2015
3	E.Balagurusamy, “Programming with Java”, Tata McGraw-Hill publishers, 6th edition, 2019

Mode of Evaluation: No separate evaluation for theory component.			
Indicative Experiments			
1.	Programs using sequential and branching structures.		
2.	Experiment the use of looping, arrays and strings.		
3.	Demonstrate basic Object-Oriented programming elements.		
4.	Experiment the use of inheritance, polymorphism and abstract classes.		
5.	Designing packages and demonstrate exception handling.		
6.	Demonstrate the use of IO streams, file handling and serialization.		
7.	Program to discover application of collections.		
		Total Laboratory Hours	**60 hours**
Text Book(s)			
1.	Marc Loy, Patrick Niemeyer and Daniel Leuck, Learning Java, O'Reilly Media, Inc., 5th Edition, 2020.		
Reference Books			
1.	Dhruti Shah, 100+ Solutions in Java: A Hands-On Introduction to Programming in Java, BPB Publications, 1st Edition, 2020.		
Mode of assessment: Continuous assessments and FAT			
Recommended by Board of Studies		03.07.2021	
Approved by Academic Council	No. 63	Date	23.09.2021