Course: BTech

Semester: 3

Prerequisite: Basic knowledge of programming concepts and familiarity with OOP principles.

Rationale: This course provides a broad introduction to software engineering. The various process models required to develop software is also being described. Moreover the functional and non-functional requirements are also described.

Teaching and Examination Scheme

Teaching Scheme					Examination Scheme					
					Internal Marks			External Marks		Total
Lecture Hrs/Week	Tutorial Hrs/Week	Lab Hrs/Week	Hrs/Week	Credit	T	CE	P	T	P	
2	0	0	0	2	20	20	-	60	-	100

SEE - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)

Course Content

W - Weightage (%) , **T** - Teaching hours

Sr.	Topics	W	T
1	**Design introduction:** Object-oriented programming, oops principles, encapsulation, inheritance and polymorphism java as a oops & internet enabled language, importance of java, java usage in industry, the byte code, compiling, and running of simple java program, jvm, jdk, jre	8	2
2	**Data types, variable, operators:** Data types, variables, dynamic initialization, scope and lifetime of variables, type conversion and casting, operators	10	3
3	**Control statements:**Conditional Statements, Looping Statements, Jump Statements	10	3
4	**Arrays:**Array, Array values and memory storage Structure, Types of Arrays.	8	3
5	**Object oriented programming:** Classes and objects: concepts of classes and objects, declaring objects, assigning object reference variables, methods, constructors, access control, garbage collection, usage of static with data and methods, usage of final with data, overloading methods and constructors, parameter passing - call by value, recursion, nested classes.	20	4
6	**Inheritance:** Inheritance Basics, member access rules, Usage of super key word, forms of inheritance, Method Overriding, Abstract classes, Dynamic method dispatch, Using final with inheritance	8	2
7	**Strings, Packages and Interfaces:** String handling functions, Packages, Class path, importing packages, differences between classes and interfaces, Implementing & Applying interface, enumerations in java.	12	4
8	**Exception Handling:** Errors, types of error, exception and its types, tryCatch method, difference between finally, final and finalize, throw.	8	3
9	**Multi Threading:** Process and Thread, multitasking (process and thread), thread lifecycle, Types of threads, Creating a Thread and Running it, terminating the Thread**.**	10	3
10	**Collections Framework:** : Functional Programming, Collections, Hierarchy of collections-lists (arraylist and linklist), Queue (priorityQueue)	6	3

Reference Books

1. **Programming with Java – A primer by E. Balagurusamy, Tata Mc-Graw Hill Publication**

2. **Programming in Java2 by Dr. K. Somasundaram, Jaico Books**

3. **Core Java Volume-I Fundamentals by Horstmann & Cornell, Eight Edition, Pearson Education**

4. **Java Programming by D. S. Malik, Cengage Learning**

Course Outcomes

At the end of this course Students Will be able to:

1 Describe the principles of object-oriented programming using java.

2 Implement Java code to solve problems using control statements, arrays, inheritance, and strings.

3 Apply the concept of Exception handling, packages ,interfaces and Multithreading.

4 Develop object-oriented programs using collections framework concepts and functional programming principles.