Course Code PLA1001	**Programming for Computing Engineers**	Course Type	LT
		Credits	4

Course Objectives:

The students will be able to

- Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
- Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
- Understand the principles of inheritance, packages and interfaces
- Work on data and databases in Java

Course Outcomes:

The students who complete the course will be able to

- Identify classes, objects, members of a class and relationships among them needed for a specific problem
- Write Java application programs using OOP principles and proper program structuring
- Demonstrate the concepts of polymorphism and inheritance
- Write Java programs to implement error handling techniques using exception handling
- Handle database operations using Java

Student Outcomes (SO): d,g,j

Mod. No.	Module Description	Lect. Hrs	SO
1	**Object and Class, Data types, Basic I / O:** Types of programming, Disadvantages of functional programming Class & Objects, Attributes, Methods, Objects, Solving MCQs based on Objects and Classes, Solving tricky questions based on encapsulation, Solving frequently asked object based questions. Data types, Data Why data type, Variables, Available data types, Numeric – int, float, double, Character – char, string, Solving MCQs based on type casting, data types, Solving debugging based MCQs, Printing, Getting input from user during run time, Command line arguments, Solving programming questions based on CLA, Solving MCQs questions based on CLA.	7	d,g, j
2	**Decision Making, Loop Control, String, Date, Array** Need for control statement, if..else, if..else if..else, Nested if..else Switch case, Common mistakes with control statements (like using = instead of ==), Solving frequently asked questions on decision making Types of looping statements, Entry Controlled, For While, Exit Controlled, do while, break and continue, Demo on looping, Common mistakes with looping statements (like using ; at the end of the loop) Solving pattern programming problems, series problems, Solving predict the output questions, String handling, date handling, Solving problems based on arrays like searching, sorting, rearranging, iteration)	9	
3	**Inheritance** Need, Is A – Inheritance, Types of inheritance supported, Diagrammatic representation, Demo on inheritance, Has A – Aggregation, Diagrammatic representation, Demo on aggregation	9	

		Uses A - Association, Diagrammatic representation, Demo on association, Assignment on relationships, Solving MCQs based on relationships between classes		
4		**Modifiers, Interface & Abstract classes (Java specific), Packages:** Types of access specifiers, Demo on access specifiers, Assignment on access modifiers, Instance Members, Solving MCQs based on modifiers Abstract Classes, Need, Abstract Classes, Abstract Methods, Interfaces Assignment on abstract classes and interface, Need for packages , **Collections:** ArrayList, LinkedList, List Interface, HashSet, Map Interface, HashMap, Set Programming questions based on collections, Real world problems based on data structure	**9**	**d,g, j**
6		**Threads, Exceptions, LinkedList, Arrays, Stack and Queue:** Need of threads, Creating threads, Wait, Sleep, Thread execution, Need for exception handling, try, catch, throw, throws, Creating own exception (Java, Python), Handling own exceptions, Solving programming questions based on linked list and arrays, Solving programming questions based on stacks and queues, How to implement a stack using queue? How to implement a queue using stack? **Trees, JDBC Connectivity:** Solving programming questions based on trees, binary trees, binary search trees, JDBC Overview, Database Setup, Install the MySQL Database, Create New Database User in MySQL Workbench. **JDBC Data:** Selecting data from tables, Inserting Data into the Database Updating Data in the Database, Deleting Data from the Database Creating Prepared Statements, Networking : Working with URLs, Sending HTTP Requests, Processing JSON data using Java	**9**	
		Guest Lecture on Contemporary Topics	**2**	
		Total Lecture Hours:	**45**	

Mode of Teaching and Learning:
Flipped Class Room, Activity Based Teaching/Learning, Digital/Computer based models, wherever possible to augment lecture for practice/tutorial and minimum 2 hours lecture by industry experts on contemporary topics

Mode of Evaluation:
The assessment and evaluation components may consist of unannounced open book examinations, quizzes, student's portfolio generation and assessment, and any other innovative assessment practices followed by faculty, in addition to the Continuous Assessment Tests and Term End Examination.

Text Book(s):

1.	Herbert Schildt, "Java the Complete Reference", Eleventh edition, Tata Mc-Graw Hill ,2018.
2.	Joshua Bloch, "Effective Java", Addison-Wesley Professional; 3rd edition, 2018.
3.	Y. Daniel Liang, "Introduction to Java Programming and Data Structures", Comprehensive Version, Loose Leaf Edition, Pearson, 12th edition, December 14, 2019.

Reference Books:

1.	Kathy Sierra and Bert Bates, "Head First Java", O'Reilly Media, 2nd edition, 2005

2.	Tony Gaddis, "Starting Out with Java: From Control Structures through Objects", Pearson, 7th edition, 2018.	
3.	Gayle Laakmann McDowell, "Cracking the Coding Interview: 189 Programming Questions and Solutions", CareerCup, 6th edition (July 1, 2015)	
Recommendation by the Board of Studies on		24.06.2020
Approval by Academic council on		29.06.2020
Compiled by : Dr Shriram		