SEMESTER S4

OBJECT ORIENTED PROGRAMMING

Course Code	PEMRT415	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	5/3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	UCEST105 Algorithmic Thinking with Python	Course Type	Theory

Course Objectives:

1. The purpose of this course is to enable learners to solve problems by breaking it down to object level while designing software and to implement it using Java.
2. This course covers the fundamental principles of object-oriented programming in Java, including classes, objects, inheritance, polymorphism, encapsulation and abstraction, and effectively applies them.
3. This course helps the learners to develop Java applications that utilize object-oriented programming principles to achieve modularity, reusability, and scalability in software design and implementation

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	Basic Object-Oriented concepts, Introduction to Java - Java programming and Runtime Environment, Development Platforms- Java Virtual Machine (JVM), Java compiler, Bytecode, Java Buzzwords, Java program structure, Comments. Primitive Data types - Integers, Floating Point Types, Characters, Boolean. Literals, Operators - Arithmetic Operators, Bitwise Operators, Relational Operators, Boolean Logical Operators, Assignment Operator, Conditional (Ternary) Operator. Control Statements - Selection Statements, Iteration Statements and Jump Statements.	11

2	Object Oriented Programming in Java - Class Fundamentals, Declaring Objects, Introduction to Methods, Constructors, this Keyword, Method Overloading, Using Objects as Parameters, Returning Objects. Static Members, Final Variables, Inner Classes. Inheritance - Super Class, Sub Class, The Keyword super, protected Members, Calling Order of Constructors, Method Overriding, the Object class, Abstract Classes and Methods, using final with Inheritance. Packages and Interfaces	**11**
3	Exception Handling - Checked Exceptions, Unchecked Exceptions, try Block and catch Clause, Multiple catch Clauses, Nested try Statements, throw. Java Library - String Handling – String Constructors, String Length, Special String Operations. Multithreaded Programming - The Java Thread Model, The Main Thread, Creating Thread, Creating Multiple Threads, Synchronization, Suspending, Resuming and Stopping Threads.	**11**
4	Event handling - Event Handling Mechanisms, Delegation Event Model, Event Classes, Sources of Events, Event Listener Interfaces. Java Database Connectivity (JDBC) - JDBC overview, Creating and Executing Queries – create table, delete, insert, select.	**11**

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Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

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

	Course Outcome	Bloom's Knowledge Level (KL)
CO1	Understand and apply fundamental Java programming concepts, including the runtime environment, primitive data types, operators, and control statements, to develop efficient and well-structured Java applications.	**K3**
CO2	Apply key object-oriented programming principles in Java, leveraging packages and interfaces effectively to design and implement Java applications.	**K3**
CO3	Understand the handling of Java exceptions, effectively manipulate strings, and implement multithreaded programming techniques.	**K3**
CO4	Understand the different JDBC queries to handle a data base.	**K2**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

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CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3									2
CO2	3	3	3									2
CO3	3	3	3		2							2
CO4	3	3	3		2							2
CO5	3	3	3		2							2

Note: *1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation*

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Java: The Complete reference	Herbert Schildt	Tata McGraw Hill	8/e, 2011.
2	Programming JAVA a Primer	Balagurusamy E	Tata McGraw Hill	5/e, 2014

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Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Introduction to Java Programming	Y. Daniel Liang	Pearson Education	7/e, 2013
2	Java How to Program, Early Objects	Paul Deitel, Harvey Deitel	Pearson Education	11/e, 2018
3	Core Java: An Integrated Approach	Nageswararao R	Dreamtech Press	2008
4	Java in A Nutshell	Flanagan D	O'Reilly	5/e, 2005
5	Core Java: Volume I & II– Fundamentals	Cay S. Horstmann and Gary Cornell	Pearson Education	2008

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1	https://archive.nptel.ac.in/courses/106/105/106105191
2	https://archive.nptel.ac.in/courses/106/105/106105191
3	https://archive.nptel.ac.in/courses/106/105/106105191
4	https://archive.nptel.ac.in/courses/106/105/106105191

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