Integrated MCA II Semester 4

Subject Name: Core Java **Subject Code:** IMCA13401

Type of course: Professional Core Course

Prerequisite (if any):
- Object Oriented Programming Language

List of Courses where this course will be prerequisite:
- Object Oriented Programming

Rationale: Java can be usedfor developing desktop, web and mobile applications. Object oriented concepts are a base for a lot of frameworks used in the industry. Learning object oriented concepts will help understanding these frameworks. Learning these concepts in Java is beneficial as it is widely accepted across the software industry.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks		Practical Marks		Total
L	T	P	C	TEE	CAT	TEP	CAP	
3	0	0	3	60	40	-	-	100

CAT: Continuous Assessment Theory comprised of CA1 and CA2 **CA1:** Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CAP:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Content	Teaching Hrs.	Module Weightage
1	**Introduction to Java:** Overview of constructs (for loop, while loop, do-while loop, if, switch), Overview of Data types (primitive and non-primitive including arrays), Overview of Operators (Arithmetic, Relational, Logical, Assignment, Ternary), Command line arguments, String, StringBuffer and StringBuilder classes	06	13%
2	**JAVA: Object Oriented Programming Language:** Classes and Objects, Member variables and Member methods, Constructors, this keyword, static members, Types of Memory (Stack, Heap, Method area) Overview of Encapsulation, Abstraction, Inheritance and Polymorphism	12	27%
3	**Interfaces and Abstract Classes:** What are interfaces and abstract classes, Difference between interfaces and abstract classes, Default and static methods of interfaces, Comparable and Comparator interfaces	06	13%
4	**Packages, Collection and Generics:** **Packages:** Built in packages (java.lang and java.util), User defined packages **Collection:** Collection classes (List, Set, Map, ArrayList, HashMap) **Generics:** Generics with respect to collection classes, Generic methods and classes	06	13%
5	**Exception Handling:** What is Exception handling, Exception hierarchy, try, catch and finally blocks, Checked and Unchecked exceptions, Exceptions with respect to method overriding, User defined exceptions	04	9%

6.	**Threads, Multithreading and Synchronization** **Threads:** What are threads? Threads vs. Process Ways of creating a thread, Thread class and thread of execution **Multithreading and Synchronization:** How to create multiple threads, Synchronization between threads using synchronized methods, synchronized blocks, Object class methods for synchronization	**06**	**13%**
7	**AWT & Event Handling** AWT components including Label, TextField and Button, Event Handling framework of Java, ActionListener, WindowListener, MouseListener, KeyListener	**05**	**12%**

Suggested Specification table with Marks (Theory):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
30	40	15	15	0	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	JAVA: TheComplete Reference	Herbert Schildt	Mc Graw Hill Education ISBN: 978-1-260-44023-2	2019	11th Edition
2	JAVA: A Beginner's Guide	Herbert Schildt	Mc Graw Hill Education ISBN: 978-1-260-44021-8	2019	8th Edition
3	Core Java Vol I – Fundamentals	Cay S Horstmann	Prentice Hall ISBN: 978-0-13-417730-4	2016	10th Edition
4	Core Java Vol II – Advanced Features	Cay S Horstmann	Prentice Hall ISBN: 978-0-13-417729-8	2017	10th Edition

Course Outcomes:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % Weightage
CO-1	Develop Java desktop applications	13
CO-2	Develop Java applications based on object oriented concepts	40
CO-3	Modularize Java application in packages and make efficient use of utility classes	13
CO-4	Implement exception handling in Java applications	9
CO-5	Implement threads in Java and develop multithreaded applications	13
CO-6	Implement event handling in Java applications	12

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13
CO-1	3	3	3	2	1	1	1	0	0	0	0	0	0
CO-2	3	3	3	2	2	1	1	0	2	0	1	1	0
CO-3	3	3	3	2	1	0	1	0	0	0	0	0	0
CO-4	3	3	3	2	1	0	1	0	0	0	0	0	0
CO-5	3	3	3	2	3	0	1	0	1	0	0	1	0
CO-6	3	3	3	2	1	0	1	0	1	0	0	0	0
Rationale*													

Rationale*: Explaining why it is matching this particular program outcome

List of Open learning website:

- https://docs.oracle.com/en/java
- https://docs.oracle.com/en/java/javase/11/docs/api/index.html
- https://www.tutorialspoint.com/java/index.htm

List of Open-Source Software:

- JDK 8 or higher
- Any Text Editor

Major Equipment Needed: NA