B. Tech. (3rd Sem)
(Common for CSE, CSE with Specialization in Data Science, CSE with specialization in Cloud Technology & Information Security)
BCSE-506 (Performance Analysis of Programming Languages)

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Continuous evaluation	**40**
End semester exam	**60**
Total marks	**100**
Credits	**3.0**

Course Objectives:

1. To make students aware about need & features of Object oriented languages.
2. To acquire knowledge about Java programming language.
3. To teach students about concurrent programming using Java.
4. To enable students to write programs based on client server programming.
5. To understand the difference between various language with respect to performance.

Lecture No.	Topic to be covered	Week No.
1.	Moto, History and Feature of Java	1
2.	Compiler, Interpreter, Concept of JVM along with its components	
3.	Paradigm: POP vs. OOP and Object Based Programming vs. Object Oriented Programming	
4.	Java OOP concept and Features of OOP	2
5.	Hello World Program, Assignment of Variables and Arithmetic operators	
6.	Loops: for, while and do-while (entry controlled vs. exit controlled)	
7.	Logical and Relational operators using Conditional constructs	3
8.	Revisiting: WAP for Factorial of a given number and Prime number	
9.	Concept of Class and Objects in Java	
10.	Constructor and their types	4
11.	Constructor and Method Overloading	
12.	Array's (1D and 2D) in Java	
13.	String handling in Java using String and StringBuffer classes	5
14.	Type Casting and Wrapper classes	
15.	Inheritance, their types and concept of super keyword	
16.	Abstract class vs. final keyword (for constant, method and class)	6
17.	Concept of Interface in Java	
18.	Access Specifiers and Packages in Java	
19.	Exception, their types, try, catch, handling multiple Exceptions	7
20.	Creating user-defined Exceptions: throw, throws	
21.	Multithreading fundamentals and Java Thread Model	
22.	Creating Threads: extending Thread class and implementing Runnable	8
23.	synchronized keyword (block and method)	
24.	Interthread communication: wait() and notify()	
25.	Producer Consumer Problem	9
26.	Monitors and Deadlock and its avoidance in Java	
27.	Basics of File handling, Modes, Types and Creation	
28.	Reading and Writing to a File: Console, File to File	10
29.	Basics of Networking: Connection Oriented vs. Connection -less	
30.	Handling IP's using InetAddress class	
31.	Client/Server Connection-Oriented Program using Socket programming	11
32.	Connection-less communication using DatagramPacket	
33.	Interaction with HTTP using HTTP	
34.	Interacting URL using	12
35.	Conway Game of Life in C and Java: Performance Analysis	
36.	Revision and Doubt Session	

Course Outcomes:

1. Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
2. Identify classes, objects, members of a class and the relationships among them needed for a specific problem.
3. Able to understand about Java programming language and use of a Java-enabled browser to execute Java applets.
4. To teach students about concurrent programming using Java.
5. Ability to write programs based on client server programming.

Instructions for paper setter: All Questions are compulsory. The Question paper is divided in to four sections A, B, C and D. Section A is compulsory and comprises of 12 questions of one mark each, 3 from each unit. The questions shall be asked in such a manner that there are no direct answers including one word answer, fill in the blanks or multiple choice questions. Section B comprises of 4 questions of 2 marks each, one from each unit. Section C Comprises of 4 questions of 4 marks each, one from each unit. Section D Comprises of 4 questions of 6 marks each, one from each unit. There is no overall choice, however internal choice may be provided in section C and D, if paper setter so desires.

Text Books:

1. "Core Java Volume-I and II" 2nd edition-Sun Micro System.
2. Patrick Naughton and Herbertz Schidt, "Java –2 The Complete Reference", second Edition.

Reference Books:

1. E. Balaguruswamy, "Programming with Java", Second edition, TMH.
2. Rick Dranell , "HTML 4 Unleashed", Second edition, Tech media publication.

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