Computer Science Paper V
Object Oriented Programming using Java-II
[Discipline Specific Course]

Semester: VI	Credits: 2	Subject Code: BS62205	Lectures: 36

Course Outcomes:

At the end of this course, the learner will be able to:
- Learn database programming using Java
- Study web development concept using Servlet and JSP
- Develop multi-core applications using multithreading
- Use Spring Framework to create web applications

Unit 1: Collections and Multithreading	12

- Collections
  o Introduction to the Collection framework
  o List - ArrayList, LinkedList
  o Set - HashSet, TreeSet,
  o Map - HashMap and TreeMap
  o Interfaces such as Comparator, Iterator, ListIterator, Enumeration
- Multithreading
  o What are threads?
  o Life cycle of thread
  o Creating threads - Thread class , Runnable interface
  o Thread priorities
  o Running multiple threads
  o Synchronization and inter-thread communication

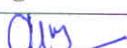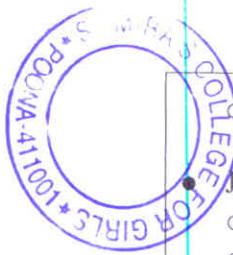| Unit 2: Database Programming	6

- The design of JDBC
- Types of JDBC drivers
- Executing SQL Statements, query execution
- Scrollable and updatable ResultSet

Unit 3: Servlets and JSP	12

- Servlets
  o Introduction to Servlet and Hierarchy of Servlet
  o Life cycle of servlet
  o Handing get and post request (HTTP)
  o Handling data from HTML to servlet
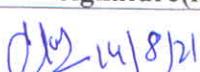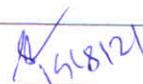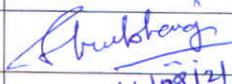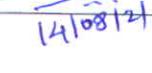 o Retrieving data from database to servlet

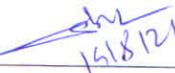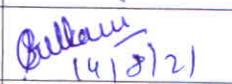| Board of Studies	Name	Signature
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Session tracking – User Authorization, URL rewriting, Hidden form fields, Cookies and HttpSession
- JSP
  - o Introduction to JSP, Life cycle of JSP
  - o Implicit Objects
  - o Scripting elements - Declarations, Expressions, Scriplets, Comments
  - o JSP Directives - Page Directive, include directive
  - o Mixing Scriplets and HTML
  - o JSP Actions - jsp:forward ,jsp:include, jsp:useBean, jsp:setProperty and jsp:getProperty

Unit 4: Spring Framework	6
• Introduction of Spring framework • Spring Modules / Architecture • Spring Applications • Spring MVC • Spring MVC Forms, Validation	

Recommended Reference Books:

- Cay S. Horstmann, Gary Cornell, *Core Java Volume-II-Advanced Features*, Eighth Edition, Prentice Hall, Sun Microsystems Press
- E. Balagurusamy, *Programming with Java*, A primer, Fourth edition
- Henry H. Liu, *Spring 4 for Developing Enterprise Applications: An End-to-End Approach*,
- Herbert Schildt, *Complete reference Java* (5th edition)
- J Sharma and Ashish Sarin, *Getting started with Spring Framework: covers Spring 5*.
- Steven Horlzner, *Java 2 programming black book*

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