

CMR Institute of Technology, Bangalore			
Department(s): Information Science & Engineering			
Semester: 04	Section(s): A, B, C	Lectures/week: 04	
Subject: Advanced Java		Code: BIS402	
Course Instructor: Dr. S. Seetha, Varsha Jituri			
Course duration: 23 rd Feb 2026 to 31 st May 2026			

Course Objectives

1. Understanding the fundamentals of collection framework
2. Demonstrate the fundamental concepts of String operations and Swing applications
3. Design and develop web applications using Java servlets and JSP
4. Apply database interaction through Java database Connectivity

Prerequisites

- Programming proficiency in C or C++
- Knowledge of Object-Oriented Concepts
- Basic data structures

Lesson Plan				
Lecture #	Book & Sections	Topics	Portions coverage	
			Teaching Aids	% of Syllabus Covered
1-8	Textbook 1: Chapter 20	Module 1 The collections and Framework: Collections Overview, The Collection Interfaces, The Collection Classes, accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working with Maps, Comparators, The Collection Algorithms, Arrays, The legacy Classes and Interfaces, Parting Thoughts on Collections.	PPT's, Chalk and Talk	20
Links to some useful online lectures: https://youtu.be/92k5uokmW9o?si=1xjumzZm1dD6tbK5				
9-16	Textbook 1: Chapter 18	Module 2: String Handling: The String Constructors, String Length, Special String Operations, Character Extraction, String Comparison, Searching Strings, Modifying a String, Data Conversion Using valueOf(), Changing the Case of Characters Within a String, joining strings, Additional String Methods, StringBuffer, StringBuilder	PPT, Chalk & Board, video lecture	20
Links to some useful online lectures: https://youtu.be/zL1DPZ0Ovlo?feature=shared				
17-24	Textbook 1: Chapters 32 & 33	Module 3: Introducing Swing: The Origin of Swing, Swing Is Built on AWT, Two Key Swing Features, The MVC Connection, Components and Containers, The Swing Packages, A Simple Swing Application, Event Handling, Painting in Swing. Exploring Swing: JLabel and ImageIcon, JTextField, The Swing Buttons-JButton, JToggleButton, Check Boxes, Radio Buttons	PPT, Chalk & Board, Program execution	20
Links to some useful online lectures: https://youtu.be/Kmgo00avvEw?si=-pgEArk1hZiLzzMJ				
25-32	Textbook 1: Chapter 36 Textbook 2: Chapter 11	Module-4: Introducing servlets: Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; The Servlet API; The Jakarta. Servlet Package; Reading Servlet Parameter; The Jakarta.servlet.http package; Handling HTTP Requests and Responses; Using Cookies; Session Tracking. Java Server Pages (JSP); JSP tags, Variables and Objects, Methods, Control statements, Loops, Request String, Parsing other information, User sessions, Cookies, Session Objects. Text Book 1: Ch 36 Text Book 2: Ch 11	PPT, Chalk & Board, Program on exception handling	20
Links to some useful online lectures: https://youtu.be/OuBUUkQfBYM?si=s9dAGpFuSsK2COib				

33-40	Textbook 2: Chapter 6	Module5: JDBC Objects: The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions.	PPT, Chalk& Board, Program execution on multithreading and enumerations.	20
Links to some useful online lectures 1. https://youtu.be/7v2OnUti2eM?feature=shared 2. https://nptel.ac.in/courses/106/105/106105191/ 3. https://nptel.ac.in/courses/106/105/106105225/ 4. https://youtu.be/qIGMxs-PbFPk				

Text Books	
1.	Herbert Schildt: JAVA the Complete Reference. Twelfth Edition, Tata McGraw-Hill.
2.	Jim Keogh, The Complete Reference J2EE, Tata McGraw-Hill 2007
Reference Books	
1.	Y. Daniel Liang: Introduction to JAVA Programming, 7th Edition, Pearson Education, 2007.
2.	Stephanie Bodoff et al: The J2EE Tutorial, 2nd Edition, Pearson Education, 2004.
3.	Uttam K Roy, Advanced JAVA programming, Oxford University press, 2015.

Syllabus for Internal Assessment Tests (IAT*)

IAT #	Syllabus
IAT-1	Class # 01 – 20
IAT-2	Class # 21-40

*See calendar of events for IAT schedule.

Evaluation :Quiz/Assignment/Seminar

- *Evaluation of course delivery is based on any one of the above*
- *Evaluation guidelines to be provided to help students understand how the evaluation would be done for assignments, quiz, and so on.*
- *Evaluation tools/method to be mentioned e.g.: Easy polls, Survey Monkey, Type form or inbuilt poll option in video conferencing tool.*
- *'Work-book' section includes additional activities to support self-learning e.g. exercises, game-based learning, case-study, and so on.*

Evaluation of course delivery is based on the following:

Evaluation Method	Weightage
Internal Assessment Tests (Average of 2 tests)	25 marks
QUIZ/Assignment- 02	25 Marks
Semester end exams	50 marks
Total	100 marks
Assignment-1: Issue date: 10/03/2026, submission date: 20/03/2026 Assignment-2: Issue date: 10/04/2026, submission date: 20/04/2026	2- Assignments.

Usage of ICT in TLP process:

1. Blended with Black board and hands on interaction
2. Multimedia Tools: Projector, pointer, powerpoint presentations, you tube videos.

Evaluation guidelines (please provide the link)	https://docs.google.com/document/d/1pvYtuxmM2xw9SdksXq_RBInBwFWmmfri/edit?usp=sharing&oid=110518168505995375072&rt=pof=true&sd=true
Evaluation tools/method	Programming Assignments, Quizzes, Presentations and Demonstrations
Flipped Classroom process for students to understand	A flipped classroom consists of students who complete direct instruction, such as viewing a lecture online and complete pre-assessment, before discussing the material in-class and take post assessment.

Workbook (Additional activities to support self-learning e.g. exercises, game-based learning, case-study etc.)

please provide the link to access the work book information	https://www.vtustudymaterials.online/ise/sem4/BIS402/workbook
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Discussion Board (teacher should set up problem-solving forums or discussion boards, and assign students or student teams to monitor and support or direct questions).

- Conduct seminars, group discussion, and problem solving in class with the students' on real-time application of JAVA.

Virtual Lab(for lab subject only).Provide the details ofvarious tools for learning, including additional web-resources, video-lectures, animated demonstrations and self-evaluation.

please provide the link to access the virtual lab information	https://www.vlab.co.in/ , https://www.jdoodle.com/java-online-editor/ , https://replit.com/languages/java , https://glitch.com/ , https://www.codechef.com/learn/java , https://www.tutorialspoint.com/compile_java_online.php , JDBC + Servlets + JSP series https://youtu.be/qIGMxs-PbFPk
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Mention the best practices identified as part of teaching this subject	
1.	Revising the previous class topics at the beginning of the class.
2.	Discuss the agenda of the current class and illustrate with applications in real time.
3.	Interact with the students frequently and help them to understand the concepts well.
4.	Solving more problems.

Mention the Importance of this subject along with Real Time Applications
Java is crucial in computer science and software development due to its platform independence, object-oriented capabilities, extensive libraries, and security features. It finds applications in diverse areas, including web development, mobile apps, secure systems, and real-time applications like gaming and finance. A solid understanding of Java is essential for success in the tech industry.
Peer Learning (teacher should list out the opportunities provided to interact with peers,(through discussions & group work).
Programming Assignment / Course Project
Course Outcomes
By the end of this course, students will be able to
CO 1. Apply appropriate collection class/interface to solve the given problem
CO 2. Demonstrate the concepts of String operations in Java
CO 3. Apply the concepts of Swings to build Java applications
CO 4. Develop web based applications using Java servlets and JSP
CO 5. Use JDBC to build database applications

CO-PO and CO-PSO Mapping																			
Course Outcomes		Bloom s Level	Modu les cover ed	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3	P S O 4
CO1	Apply appropriate collection class/interface to solve the given problem	L2	1	2	2	2	2	2	2					2	2	2		1	3
CO2	Demonstrate the concept of String operation in Java	L2	2	2	3	3	3	3	3					3	2	3		1	3
CO3	Apply the concept of swing to build Java application	L3	3	2	3	3	3	3	3					3	2	3		1	3
CO4	Develop web- b a s e d application using Java servlets and JSP	L3	4	2	2	2	2	2	2					2	2	2		1	3
CO5	Use JDBC to build database applications.	L2	5	2	3	3	3	3	3					3	2	3		1	3

Note: Assignments, study material, Question bank and other course related content would be posted on site mentioned above.

Identified curriculum gap if any and Justification:

Identified Gap	Justification
<u>No Gap</u>	<u>NA</u>

Proposed Actions to fill the identified gaps:

<u>NA</u>

Signature with date:

Course Instructor

Program Coordinator

Head-ISE