Government Polytechnic, Pune

'180 OB' – Scheme

Programme	**Diploma in Computer Engineering**
Programme code	01/02/03/04/05/**06**/07/08/16/17/21/22/23/24/**26**
Name of Course	**Java Programming-II**
Course Code	**CM4109**
Prerequisite course code and name	**CM3102**
Class Declaration	**Yes**

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C		ESE	PA	*ESE	PA	
03	01	02	06	Marks	80	20	25	25	150
				Exam Duration	3 Hrs	1 Hr			

Legends: L- Lecture, P- Practical, T- Tutorial, C- Credit, ESE-End Semester Examination, PA- Progressive Assessment (Test I, II/Term Work), *- Practical Exam, $- Oral Exam, #- Online Examination each Lecture/Practical period is of one clock hour

2. RATIONALE

This course introduces students to intermediate and advanced features of the Java programming language. Student will know how to implement graphical user interfaces using Java components. In the Era of Web technology, it is essential for every diploma Engineer to have knowledge of Internet programming. This course covers advanced features of JAVA.

3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Develop standalone Applications using advanced concepts of Java.**

4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry-oriented COs associated with the above-mentioned competency:

1. Develop GUI applications using Abstract Windowing Toolkit (AWT) and event handling.
2. Create GUI applications using Swing.
3. Develop client/server applications using TCP/IP and UDP socket programming.
4. Implement Java programs using databases with Java Data Base Connectivity (JDBC) as interface.
5. Develop applications for Remote Method Invocation (RMI).
6. Implement Java programs using Servlets.

5. SUGGESTED PRACTICALS/ EXERCISES

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Program to design a form using various controls different Layouts manager	1	04
2.	1	Program to design Notepad application by using Menu class.	1	02
3.	2	Program to design a form using basic swing components and use of tabbed panes and scroll panes in Swing.	1, 2	04
4.	2	Program to map Directory tree and Table.	1, 2	02
5.	3	Program to retrieve hostname using methods in InetAddress class, URL and URL Connection class.	3	04
6.	3	Program that demonstrates TCP/IP and UDP based communication between client and server.	3	02
7.	4	Program to make connectivity with database using JDBC API to send queries through JDBC bridge & handle result.	4	02
8.	5	Create a Client/Server application using RMI.	5	02
9.	6	Program to demonstrate the use of HttpServlet as a parameterized Servlet.	6	02
10.	6	Program to send username and password using HTML forms and authenticate the user using	6	02
11.	6	Program to create session using HttpSession class to implement Session tracking using Cookies.	6	02
12.	All	Micro project (Refer point 11 for micro project list)	All COs	04
			Total Hrs.	**32**

Sr. No.	Performance Indicators	Weightage in %
a.	Correctness of Program	40
b.	Debugging ability	20
c	Quality of input and output displayed (messaging and formatting)	10
d.	Preparing assignments (write-ups, program and output).	20
e.	Submit assignment on time.	10
	Total	**100**

6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practicals, as well as aid to procure equipment by authorities concerned**.**

Sr. No	Equipment Name with Broad Specifications	Experiment Sr.No.
1.	Computer System with operating System & any latest JDK version to execute “Java” programs,	01 to 12
2.	Notepad	01 to 12
3.	Databases like Oracle, MySQL, MS-access or any other	07 to 12
4.	Apache Tomcat server version 7 or above web server	09 to 12

7. THEORY COMPONENTS

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Section - I	
Unit- I Abstract Windowing Toolkit (AWT) (Weightage-18, Hrs- 12)	
1a. Enlist various AWT components. 1b. Describe Event Delegation Model. 1c. Describe various handling events by extending AWT 1d. Design a form containing various AWT components and apply event handling.	1.1 Introduction to AWT**,** AWT classes, Window fundamentals, working with frame Windows, creating a frame Window in an Applet, Creating windowed program. 1.2 Display information within a window. 1.3 Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, Checkbox Group, Choice Controls, Using Lists, managing scroll Bars, using a Text Field, Using a Text Area. 1.4 Understanding Layout Managers, Menu Bars and Menus, Dialog Boxes, File Dialog. 1.5 The delegation event model, Event classes, Sources of Events, Event Listener Interfaces. 1.6 Handling events by Extending AWT Components, Exploring the Controls, Menus, and Layout manager. 1.7 Adapter classes, Inner classes.
Unit- II Swing Component (Weightage-10, Hrs- 06)	
2a. Differentiate between AWT and Swing. 2b. Use swing components to Develop Graphical user interface (GUI) programs. 2c. Develop Graphical user interface (GUI) programs using advanced swing components.	2.1 Introduction to Swing: Swing features, difference between AWT and Swing. 2.2 Swing Components: Japplet, Icons and JLabels ,JText Fields, JButtons. JCombo Boxes, JCheckboxes, JRadio Buttons. 2.3 Advanced Swing Components: Tabbed Panes, Scroll Panes, Trees, Tables, Progress bars, Tooltips.
Unit - III Networking Basics (Weightage- 12, Hrs-06)	
3a. Define socket. 3b. Compare various sockets. 3c. Write a java program for client server communication using sockets. 3d. Differentiate between TCP/IP and UDP.	3.1 Socket overview, client/server, reserved sockets, proxy servers, Internet addressing. 3.2 Inetaddress, Factory methods, instance method TCP/IP Client Sockets. 3.3 What is URL Format? URL connection, TCI/IP Server Sockets. 3.4 Datagrams: Datagram packets Datagram server & client.
Section - II	
Unit - IV Java Database Connectivity (Weightage- 14, Hrs- 08)	
4a. Describe the Basics of JDBC 4b. Develop a program for JDBC connectivity. 4c. Develop program to establish connectivity with the specified database.	4.1 Introduction to JDBC, ODBC. 4.2 JDBC architecture: Two tier and Three tier models. 4.3 Types of JDBC drivers. 4.4 Driver Interfaces and Driver manger Class: Connection Interface and Statement Interface, Prepared statement Interface, Result Set Interface. 4.5 JDBC Database Example
Unit - V Remote Method Invocation (Weightage- 12, Hrs-06)	

5a. Compare Distributed and Non distributed Java Programs. 5b. Draw RMI Architecture. 5c. Define stubs and skeletons.	5.1 Introduction to Distributed Computing with RMI: Goals, Comparison of Distributed and Non distributed Java Programs. 5.2 Java RMI Architecture and Interfaces. 5.3 Naming Remote Objects, Using RMI, Interfaces, Implementation, Stubs and Skeletons, Host Server, Client. 5.4 Running RMI System, Parameters in RMI, Remote Object Parameters.
Unit -VI Servlets (Weightage- 14, Hrs-10)	
6a. Explain Function of the given method of Servlet life cycle. 6b. Use relevant Generic servlet to develop given web-based application. 6c. Use relevant HTTP servlet to develop specified web-based application. 6d. Develop servlet for cookies and session tracking to implement the given problem.	6.1 The Life cycle of servlet 6.2 Creating simple Servlet: The Servlet API, javax. servlet Package, Servlet Interface, Servlet Config Interface, ServletContex Interface, Servlet Request Interface, Servlet response Interface, Generic Servlet class 6.3 The java. Servlet.httpPackage: HttpServlet Request Interface, Http Servlet Response Interface, Http Session Interface, Cookie class, Http Servlet class, Http Session Event class, Http Session binding Event class. 6.4 Handling HTTP Requests and Responses Handling HTTP GET Request Handling HTTP POST Requests. 6.5 Cookies and session Tracking.

8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
Section -I						
I	Abstract Windowing Toolkit (AWT)	12	06	06	06	18
II	Swing Component	06	02	02	06	10
III	Networking Basics	06	04	02	06	12
	Total	**24**	**12**	**10**	**18**	**40**
Section -II						
IV	Java Database Connectivity (JDBC)	08	04	04	06	14
V	Remote Method Invocation	06	04	04	04	12
VI	Servlets	10	04	04	06	14
	Total	**24**	**12**	**12**	**16**	**40**
Grand Total		**48**	**24**	**22**	**34**	**80**

9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related ***co-curricular*** activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

a. Prepare journal based on practical performed in laboratory.
b. Follow Coding Standards.
c. Give seminar on relevant topic
d. Undertake micro-projects.
e. Develop variety of program to improve logical skills.
f. Develop Application oriented real world programs.

10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

a. Massive open online courses (***MOOCs***) may be used to teach various topics/sub topics.
b. About ***15-20% of the topics/sub-topics*** which is relatively simpler or descriptive in nature is to be given to the students for ***self-directed learning*** and assess the development of the COs through classroom presentations.
c. With respect to item No.9, teachers need to ensure to create opportunities and provisions for ***co-curricular activities***.
d. Use different Audio-Visual media for Concept understanding.
e. Guide student(s) in undertaking micro-projects.
f. Demonstrate students thoroughly before they start doing the practice.
g. Observe continuously and monitor the performance of students in Lab.

11. SUGGESTED MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. In special situations where groups have to be formed for micro-projects, the number of students in the group should ***not exceed three.*** The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. (Affective Domain Outcomes). Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before submission. The student ought to submit micro-project by the end of the semester to develop the industry-oriented COs.

A suggestive list of micro-projects is given here. Similar micro-projects could be added by the concerned faculty:

a. Library Management system
b. Hospital Management System
c. Medical Store Stock Management System
d. Online Railway Reservation System

12. LEARNING RESOURCES

Sr. No.	Title	Author,	Publisher, Edition and Year of Publication ISBN Number
1	Core Java Volume II	Cay S. Horstmann	Pearson, Edition 10 ISBN :978-9332582712
2	Special edition using java1.2	Joseph L.Weber	Que Pub 4th Edition Sept 1998 ISBN :0789709368
3	The Complete Reference Java 2	Schildt, Herbert,	Mcgraw Hill Education, New Delhi, Fifth Edition ISBN:9789351199250
4	Java 2 Programming Black Book	Holzner, Steven et al.	Dreamtech Press, New Delhi ISBN 10: 817722655X ISBN 13: 9788177226553
5	Java Server Programming Tutorial JAVA EE6 Black Book	Kogent	Learning Solution Dreamtech Press, New Delhi 1.4 Edition ISBN:978-8177226249

13. SOFTWARE/LEARNING WEBSITES

1. http://www.nptel.ac.in
2. https://www.tutorialspoint.com/cprogramming
3. https://onlinecourses.nptel.ac.in

14. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	2	1	1	1	1	1	1
CO2	2	1	1	1	1	1	1
CO3	3	2	3	3	1	1	1
CO4	3	2	3	3	1	1	2
CO5	3	2	3	3	1	1	1
CO6	3	2	3	3	1	2	2

	PSO1	PSO2
CO1	-	3
CO2	-	2
CO3	-	2
CO4	-	2
CO5	-	3
CO6	-	2

Sign: Name: 1. H. S. Pawar 2. R. J. Chavan 3 S. S. Ingavale (Course Experts)	Sign: Name Mr. U. V. Kokate Dr. S. B. Nikam (Head of the Department) (Department of Computer Engineering)
Sign: Mr. U. V. Kokate Dr. S. B. Nikam (Programme Head) (Department of Computer Engineering)	Sign: Mr. A. S. Zanpure (CDC In-charge)