GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: ADVANCE JAVA PROGRAMMING
(COURSE CODE: 3360701)

Diploma Programme in which this course is offered	Semester in which offered
COMPUTER ENGINEERING/ INFORMATION TECHNOLOGY	SIXTH

1. **RATIONALE** :

   This course is to teach the students about the advances in JAVA PROGRAMMING. It covers the basic underlying concepts and techniques recently used in the IT industry. After going through this course student will be able to understand Web Development & Desktop application Development.

2. **COMPETENCY:**

   The course content should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competencies:

   - **Students will demonstrate the ability to design, code and test advanced Java programming project using graphical user interface in Java, and utilizes principles of event-handling in order to manipulate, store, and retrieve user data.**

3. **COURSE OUTCOMES:**
   The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

   i.   Develop Applet Programming using various techniques
   ii. Develop applications using AWT Events
   iii. Update and retrieve the data from the databases using JDBC-ODBC.
   iv. Develop server side programs in the form of servlets.
   v.   Develop JSP applications using JSP Tags.

4. TEACHING AND EXAMINATION   SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	200
3	0	4	7	70	30	40	60	

Legends: L - Lecture; **T -** Tutorial/Teacher Guided Student Activity; **P -** Practical;   **C -** Credit; **ESE** - End Semester Examination; **PA** - Progressive Assessment
Note: It is the responsibility of the institute heads that marks for **PA of theory** & **ESE and PA of practical** for each student are entered online into the GTU Portal at the end of each semester within the dates specified by GTU.

5. COURSE DETAILS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit I -Java Applets	1a. Define & explain applet Life cycle 1b. Differentiate local and remote applet	1.1 Concept of Applet Programming : Local and remote applets, difference between applet and application, Preparing to write applets, Building applet code, Applet life cycle, Creating an Executable Applet
	1c. Write the code for a simple Java applet 1d. Explain applet tag and its parameter 1e. Use the methods of the Applet and Component classes required for a basic applet	1.2 Designing a Web page : Applet tag, Adding Applet to HTML file, Running the Applet, Passing parameter to applet
Unit -II **Introduction of Abstract Window Toolkit: (AWT)**	2a. Describe the classes in the AWT package that relate to the Applet class	2.1 Working with Windows and AWT : AWT classes hierarchy, Windows Fundamentals 2.2 Working with frame windows : creating a frame window in applet, Canvas, Creating windowed program
	2b. Describe the AWT graphics explain controls and how to apply them in the container	2.3 Working with graphics - AWT Controls: Labels, TextField, Push buttons, 2.4 Layout Managers(Flow Layout, Border Layout, Grid Layout, Card Layout) 2.5 Gui with Swing using : JApplet, JLabel, JTextField, JButton, JCheckBox, JRadioButton, JComboBox, Menus
	2c. Develop simple programs using Event class and Event Listener Interface	2.6 Event Classes: MouseEvent Class , ActionEvent Class, WindowEvent Class 2.7 2.5 Event Listner Interface: MouseListener, ActionListener, WindowListener & KeyListner I
Unit – III	3a. Develop a program for steps	3.1 Client-Server Design: Two-Tier Database

Java Data Base Client/ Server	to connect a database	Design, Three-Tier Database Design
	3b.Describe the Basics of JDBC. 3c. Explain the different Types of JDBC drivers & their advantages and Disadvantages 3d. Develop program to use JDBC to query a database and modify	3.2 The JDBC API: The API Components, Database Creation, table creation using SQL 3.3 JDBC Database Example 3.4 JDBC Drivers 3.5 JDBC-ODBC Bridge 3.6 JDBC- Advantages and Disadvantages
Unit IV **Servlets**	4a. Describe life cycle of servlet	4.1 The Life Cycle Of a Servlet 4.2 The Java Servlet Development Kit 4.3 The Simple Servlet: Creating and compile servlet source code, start a web browser and request the servlet, example of echo servlet and deployment in tomcat server 4.4 The Servlet API, XML configuration in Tomcat
	4b. Develop program using javax.servlet package	4.5The javax.servlet Package: Reading databse/table records and displaying using servlet
Unit V **Java Server Pages: (JSP)**	5a. Explain JSP Architecture and its Life cycle 5b. Develop simple programs using java server pages tags	5.1 Relation of Applets and Servlets with JSP 5.2 JSP Scripting Elements 5.3 JSP Expressions 5.4 Difference between JSP and Servlet 5.5 JSP Declarations 5.6 Simple JSP program to fetch database records

6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks (Duration – 42 Hours)			
			R Level	U Level	A Level	Total
1.	Java Applets	09	4	4	4	12
2.	Using Abstract Window Toolkit: (AWT) and User Interface	12	6	8	7	21
3.	Java Data Base Client/ Server	05	4	4	4	12
4.	Servlets	08	5	5	5	15
5.	Java server pages: (JSP)	08	2	3	5	10
	Total	**42**	**21**	**24**	**25**	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

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

7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical should be properly designed and implemented with an attempt to develop different types of skills **(outcomes in psychomotor and affective domain)** so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

*Note: Here only outcomes in psychomotor domain are listed as practical. However, if these practical are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*
Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hrs. required
1		Write an applet that draws a circle. The dimension of the applet should be 500 x 300 pixels. The circle should be centered in the applet and have a radius of 100 pixels. Display your name centered in a circle.(using **drawOval**() method)	2
2		Draw ten red circles in a vertical column in the center of the applet.	2
3		Built an applet that displays a horizontal rectangle in its center. Let the rectangle fill with color from left to right.	2
4	I	Write an applet that display the position of the mouse at the upper left corner of the applet when it is dragged or moved. draw a 10x10 pixel rectangle filed with black at the current mouse position.	2
5		Write an applet that contains one button. Initialize the label on the button to "start", when the user presses the button change the label between these two values each time the button is pressed.	2
6		Write an applet that uses the mouse listener, which overrides only two methods which are mousePressed and mouseReleased.	2
7		Write a program that has only one button in the frame, clicking on the button cycles through the colors: red->green->blue-> and so on.one color change per click.(use **getBackGround**() method to get the current color)	4
8	II	Write an applet that contains three check boxes and 30 x 30 pixel canvas. The three checkboxes should be labeled "Red", "Green", "Blue". The selection of the check boxes determine the color of the canvas. For example, if the user selects both "Red" and "Blue", the canvas should be purple.	2
9		Create an application that displays a frame with a menubar. When a user selects any menu or menu item, display that selection on a text area in the center of the frame	2

10		Write an applet that draws two sets of ever-decreasing rectangles one in outline form and one filled alternately in black and white.	4
11	III	Write a database application that use any JDBC driver	4
12		Develop a UI that performs the following SQL operations:1) Insert 2)Delete 3)Update.	4
13		Write a program to present a set of choice for user to select a product & display the price of product.	4
14	IV	Write a simple servlet program which maintains a counter for the number of times it has been accessed since its loading, initialize the counter using deployment descriptor.	4
15		Create a form processing servlet which demonstrates use of cookies and sessions.	4
16	V	Write a simple JSP program for user Registration & then control will be transfer it into second page.	4
17		Write a simple JSP program for user login form with static & dynamic database	4
18		Write a JSP program to display the grade of a student by accepting the marks of five subjects.	4
		Total Hours	56

8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:
  i.   Understanding of Advance JAVA programming.
  ii. Demonstrate Advance JAVA programming in real world.
  iii. Develop a program with real world application
  iv. Develop Mini Projects
  v.   Solve Real time industry problems through Advance JAVA programming.

9.   SPECIAL INSTRUCTIONAL STRATEGIES (if any)
  i. Faculty should demonstrate the features of Advance Java for clear understanding of the students

10. SUGGESTED LEARNING RESOURCES

(A) List of Books:

Sr No.	Title of Book	Author	Publication
1	Complete Reference Java 2 Seventh or Eighth Edition	Herbert Schildt	TMH 2012
2	Core Java Volume-I Fundamentals 9th Ed.	Cay S. Horstmann Gary Cornell	Pearson, 2014
2	Swing: A Beginner's Guide	Herbert Schildt	TMH
3	Java Programming CookBook	Herbert Schildt	MGH
4	Unleashed Java 2 Platform	Jamie Jaworski	Sams Techmedia
5	Java Programming	Sachin Malhotra,	Oxford

			Saurabh Choudhary	
6	Introduction to Java Programming 7th edition	Y. Daniel Liang	Pearson
7	Web Technology with Advanced Java	Soumadip Ghosh	University Press 2011
8	Java Enterprise Edition A Practical Approach	B. Mohamed Ibrahim	University Press 2013
9	Java Swing	obert Eckstein, Marc Loy, Dave Wood	O'Reilly Media
10	Java 2 Intermediate to Advanced User Guide for Technicians	Benjamin Aumaille	Firewall Media

(B) List of Major Equipment/Materials

Hardware: Desktop Computer P-IV processor or higher
Software: jdk1.2 or higher version, BlueJ, NetBeans , Eclipse

(C) List of Software / Learning Websites
i. Refer Edx.org site for HKUSTx: COMP102x Introduction to Computing with Java, coursera.org for similar courses
ii. https://docs.oracle.com/javase/tutorial/deployment/applet/index.html
iii. https://docs.oracle.com/javaee/6/tutorial/doc/bnafd.html
iv. https://docs.oracle.com/javase/tutorial/jdbc/
v. https://docs.oracle.com/javaee/5/tutorial/doc/bnagx.html
vi. Table of content for chapter 2
http://docs.oracle.com/javase/tutorial/uiswing/TOC.html
vii. on MIT Platform Open course on java :
http://math.hws.edu/javanotes/c6/index.html
viii. Applet Fundamentals
http://docs.oracle.com/javase/tutorial/deployment/applet/index.html
ix. Entire Tutorial on Swing
http://docs.oracle.com/javase/tutorial/uiswing/start/about.html
x. Examples :
http://docs.oracle.com/javase/tutorial/uiswing/examples/components/index.html
xi. All Componet Details
http://docs.oracle.com/javase/tutorial/uiswing/components/index.html
xii. Lay out Managers :
http://docs.oracle.com/javase/tutorial/uiswing/layout/index.html
xiii. Events : http://docs.oracle.com/javase/tutorial/uiswing/events/index.html

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics
- **Prof. P. P. Kotak**, H. O. D Computer Department, A. V. P. T. I., Rajkot
- **Prof. R. M. Shaikh**, H.O.D Computer Department, K. D. Polytechnic, Patan
- **Prof. K. N. Raval**, H.O.D Computer Department, R. C. Technical Institute, Ahmedabad

- **Prof. R. M. Shah**, Sr. Lecturer in Computer Technology, Government Polytechnic, Ahmedabad.
- **Ms. A. S. Galathiya**, Lecturer Computer, R C Technical Institute, Ahmedabad.
- **Mr. H. J. Prajapati**, Lecturer (IT), Government Polytechnic, Himatnagar.
- **Mr. A. J. Shah**, Lecturer IT, L.J Polytechnic, Ahmedabad.

Coordinator and Faculty Members from NITTTR Bhopal

1) **Dr. M. A. Rizvi,** Associate Professor, Dept. of Computer Engineering and Applications.
2) **Dr. R. K. Kapoor**, Associate Professor, Dept. of Computer Engineering and Applications, NITTTR