

**DIPLOMA IT SEM-6 Teaching Scheme**

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME				
		L	T	P	CREDITS (L+T+P)	THEORY MARKS		PRACTICAL MARKS		GRAND TOTAL
3361601	WEB AND NETWORK SECURITY	4	0	2	6	70	30	20	30	150
3360701	ADVANCE JAVA PROGRAMMING	3	0	4	7	70	30	40	60	200
3361602	ANDROID APPS DEVELOPMENT	3	0	4	7	70	30	40	60	200
3361603	WEB DESIGNING USING PHP AND MYSQL	3	0	4	5	70	30	40	60	200
3361606	PROJECT-II	0	0	6	6	0	0	40	90	150
TOTAL		13	0	20	33	280	120	200	300	900

**ESE: END SEMESTER EXAM**

**ESE FOR PRACTICAL**

**INCLUDES**

**L:LECTURE**

**P: PRACTICAL**

**T:TUTORIAL**

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT****COURSE CURRICULUM****COURSE TITLE: ADVANCE JAVA PROGRAMMING  
(COURSE CODE: 3360701)**

<b>Diploma Programme in which this course is offered</b>	<b>Semester in which offered</b>
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.

- Develop Applet Programming using various techniques
- Develop applications using AWT Events
- Update and retrieve the data from the databases using JDBC-ODBC.
- Develop server side programs in the form of servlets.
- 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	
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
<b>Unit I -Java Applets</b>	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 AppletandComponent 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
<b>Unit -II Introduction of Abstract Window Toolkit: (AWT)</b>	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
<b>Unit – III</b>	3a. Develop a program for steps	3.1 Client-Server Design: Two-Tier Database

<b>Java Data Base Client/ Server</b>	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
<b>Unit IV Servlets</b>	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	4.5 The javax.servlet Package: Reading database/table records and displaying using servlet
<b>Unit V Java Server Pages: (JSP)</b>	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
	<b>Total</b>	<b>42</b>	<b>21</b>	<b>24</b>	<b>25</b>	<b>70</b>

**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	I	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 <b>drawOval()</b> 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		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	II	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 <b>getBackGround()</b> method to get the current color)	4
8		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
<b>Total Hours</b>			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 9 <sup>th</sup> 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	Robert 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 Component 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



**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM  
COURSE TITLE: WEB AND NETWORK SECURITY  
(COURSE CODE: 3361601 )**

<b>Diploma Program in which this course is offered</b>	<b>Semester in which offered</b>
Information Technology	SIXTH

### 3. RATIONALE

This course is to teach the students about the advances in Network and web Security. It covers the basic underlying concepts and techniques recently used in the IT industry. After going through this course students will be able to understand public key cryptography as well as digital signature. They will also learn about various encryption algorithms using public key cryptography. They will go through significantly latest security measures in Network.

### 2. COMPETENCIES

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:

- **Manage various Encryption Algorithms for Web Security Applications**
- **Apply Network security**

### 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. Describe importance of RSA Algorithm and Asymmetric cryptography.
- ii. Explain Basic concept of Message Authentication Codes
- iii. Explain basic concept of Web Security.
- iv. Demonstrate use of digital signature
- v. Apply Application level security on web browser
- vi. Apply various parameters of antivirus and firewall security on network.

### 4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
4	0	2	6	70	30	20	30	<b>150</b>

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

## 5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I</b> <b>Public Key Crypto Systems</b>	1a. Describe the basics of Asymmetric cryptography	1.1 Asymmetric key cryptography: History and its overview
	1b. Explain the principles Of Public-Key Cryptosystems	1.2 Principles of pubic key cryptosystems. 1.3 Applications of Public Key cryptosystems. 1.4 Requirements for Public-Key Cryptography 1.5 Public-Key Cryptanalysis
	1c. Describe RSA Algorithm, its approach ,block diagram and security aspects	1.6 RSA algorithm: Description and explanation 1.7 General approach, block diagram and example for RSA. 1.8 The Security of RSA
<b>Unit – II</b> <b>MAC and Hash Functions</b>	2a. Explain Hash Functions , MD5 and basics of SHA	2.1 Hash Functions :Applications of cryptographic. 2.2 Hash function based on block ciphers.( Block diagram and explanation only) 2.2.1 Rabin scheme. 2.2.2 Davies-Meyer Scheme 2.3 Message Digest5 Hashing 2.4 Requirements for a cryptographic Hash function. 2.5 Secure Hash Algorithm (SHA ) its overview
	2b. Describe Message Authentication Code	2.6 Message Authentication: Requirements and Functions 2.6.1 Message Encryption 2.7 Message Authentication Code: Introduction and Requirements 2.8 Security of MAC
<b>Unit – III</b> <b>Network Security Application</b>	3a. Describe applications of Digital Signature. 3b.Demonstrate use of digital signature	3.1 Digital signatures: Definition and Properties. 3.1.1 Difference between conventional and digital signature. 3.1.2 Digital signature requirements and Applications. 3.2 Digital Signature Standard (DSS) Approach 3.3 Applications of Digital signatures.
	3b. Explain PGP and S/MIME Electronic Mail Security	3.4 Pretty Good Privacy(PGP): Operational Description, Confidentiality and Authentication, General format of PGP message 3.5 S/MIME 3.5.1 MIME contents types.: 3.5.2 S/MIME functions:Concept,Introduction
	3c. Explain IP Security	3.6 IP Security Overview 3.6.1 Applications and benefits of IPsec. 3.6.2 IPsec documents. 3.6.3 IPsec Services.

<b>Unit – IV</b> <b>Web Security</b>	4a. Explain Web Security	4.1 Web Security Considerations. 4.1.1 Web security threats. 4.1.2 Web traffic security approaches. 4.2 Secure Socket Layer and Transport Layer Security 4.2.1 Overview of SSL Protocol Stack( diagram and explanation only) 4.3 HTTPS 4.3.1 Connection initiation. 4.3.2 Connection closure.
	4b. Apply Application level security on web browser	4.4 Basic Concept of Secure Electronic Transactions 4.5 SSL versus SET 4.6 D Secure Protocol
<b>Unit - V</b> <b>System Security</b>	5a. Explain Intrusion, Intrusion detection techniques and password management. 5b. Install and Configure an Antivirus Software	5.1 Intrusion 5.2 Classification of Intruders 5.3 Intrusion Detection techniques. 5.3.1 Statistical anomaly detection 5.3.2 Rule based detection. 5.4 Password Management 5.4.1 Password selection strategies. 5.5 Malicious software : Virus and Related Threats, Virus Countermeasures
	5b. Install and configure Firewall	5.6 Need of firewall. 5.7 Firewall characteristics. 5.8 Types of Firewall 5.8.1 Packet filtering firewall. 5.8.2 Application proxy firewall. 5.8.3 Circuit level proxy firewall.

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

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
<b>I</b>	<b>Public Key Crypto Systems</b>	08	2	6	0	10
<b>II</b>	<b>MAC and Hash Functions</b>	12	4	8	2	14
<b>III</b>	<b>Network Security Application</b>	16	6	8	6	20
<b>IV</b>	<b>Web Security</b>	10	4	6	8	12
<b>V</b>	<b>System Security</b>	10	6	4	10	14
	<b>Total</b>	56	22	30	26	70

**Legends:** R = Remembrance; U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

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

## 7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises 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/exercises. However, if these practical/exercises 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.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hrs. required
1	II	1. Generate an executable file from a C compiler and generate its Message Digest Sum (MD5) sum. Note down the MD5. 2. Change the above C program with a minor modification and again generate its executable. Check the MD5 of the new file. Verify the MD5 of both the files. 3. Take 5 different application executables and check their MD5 in similar manner. Reference : ( <a href="http://www.md5summer.org/download.html">www.md5summer.org/download.html</a> ). You can alternatively use online MD5 generator.	04
2		Prepare a 5 slides presentation of RSA, explaining its working and structure	02
3	II	1. Generate an executable file from a C compiler and generate its Secure Hash Algorithm (SHA-256, SHA-512) sum. Note down the SHA values. 2. Change the above C program with a minor modification and again generate its executable. Check the SHA 256 and 512 of the new file. Verify the SHA values of both the files. 3. Take 5 different application executables and check their SHA values. Reference: (http://www.xorbin.com/tools/sha256-hash-calculator). You can download the desktop based SHA generator	02
4	II	Prepare a chart/model Message Authentication Codes(MACs)	04
5	III	Prepare a chart /model to explain the importance of Digital Signature	
		Install Wireshark tool for packet capture.	02
		Inspect IP packets and identify source and destination IP using the wireshark tool	02
6	IV	Prepare a Chart and/or presentation on SSL Protocol Stack.	02
7		1. Download Avast free AV or Clam AV open source. Check the updates of the anti malware. 2. Identify you operating system. Update the OS and identify updates.	04
8		Prepare a presentation on 3D authentication for monetary	04

		transactions (SET)	
9	V	Install and configure an Antivirus for Network security	06
10		Install and configure few features of Firewall for Network security	08
11	V	Inspect the firewall at your department in CWN. Understand its functionality, identify the important configuration parameters for the same.	04
Total Practical Hours			44

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

- Group Discussion
- Seminar
- Power Point Presentation

## 9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- i. Application for practical will be assigned to the students by the subject faculty and Students will work in a group of 3 maximum
- ii. Assignment can be given based on above topics.

## 10. SUGGESTED LEARNING RESOURCES

### A) List of Books

S. No.	Title of Book	Author	Publication
1	Cryptography and Network Security	William Stallings	Pearson
2	Cryptography and Network Security	Forouzon	Mc Graw Hill
3	Network Security Essentials.	William Stallings	Pearson
4	Network Security: Private Communication in a Public World	CharlieKaufman	Prentice Hall
5	Cryptography Theory and Practice	Douglas R. Stinson	

### B) List of Software/Learning Websites

- [www.md5summer.org/download.html](http://www.md5summer.org/download.html)
- <https://www.wireshark.org/tools/>
- [sectools.org](http://sectools.org)

### Electronic Teaching Slides (Power Point Slides)- CD/DVD

- RSA
- PKCS

- PGP
- Digital Signature
- Firewall

**Laboratory Charts**

- Asymmetric key Encryption
- Authentication
- DSS approach

**11. COURSE CURRICULUM DEVELOPMENT COMMITTEE****Faculty Members from Polytechnics**

- Prof. Manoj Parmar**, Incharge Head(IT), G P Himmatnagar.
- Prof. Manish D. Patel**, Incharge Head ( IT ), RCTI, Ahmedabad.
- Mr. Sunil Paryani**, Lecturer (IT), G P Himmatnagar.
- Ms. Darshna M. Trivedi**, Lecturer (IT), RCTI Ahmedabad.

**Coordinator and Faculty Members from NITTTR Bhopal**

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  - Dr. Shailendra Singh**, Associate Professor, Department of Computer Engineering & Applications, NITTTR, Bhopal M.P.
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**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**

**COURSE TITLE: ANDROID APP DEVELOPMENT**

**(COURSE CODE: 3361602)**

<b>Diploma Program in which this course is offered</b>	<b>Semester in which offered</b>
Information Technology	SIXTH

**4. RATIONALE**

Android application development course is designed to enable the diploma information technology students to build mobile applications on most popular mobile operating system of today. This course covers the basics of Android along necessary programming codes for developing necessary programming skills for mobile applications.

**5. COMPETENCIES**

The course content should be taught and implemented with the aim to develop skills to enable the students acquire following competencies:

Set up the Android OS development platform, develop the open source mobile operating system, develop Android applications using Eclipse Android SDK on open source and propriety O.S platforms.

Develop GUI , connect database with android applications for mobile smartphone devices.

**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.

Understand the concept of Open Source mobile development

Describe Android architecture framework

Design Android UI Layout

Develop event driven Programs

Develop application with menus and dialog boxes

**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	
3	0	4	7	70	30	40	60	<b>200</b>

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

## 5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I Android OS :Concepts</b>	1a. Explain the concept of Open source mobile technology	1.1 Mobile technology : Overview of Android - An Open Platform for Mobile development 1.2 Open Handset Alliance 1.3 Use Android for mobile development 1.4 Android Marketplaces 1.5 Android Development Environment setup 1.6 Android development Framework - Android-SDK, Eclipse Emulators / Android AVD. 1.7 Creating & setting up custom Android emulator 1.8 Android Project Framework and its applications
<b>Unit II Android Architecture</b>	2a Describe Android architecture framework	2.1 Linux Kernel 2.2 Libraries 2.3 Android Runtime 2.4 Application Framework 2.5 Applications 2.6 Android Startup and Zygote 2.7 Android Debug bridge 2.8 Android Permission model
<b>Unit – III Android Activities and UI Design</b>	3a. Design Android UI Layout	3.1 Android application components Intent, Activity, Activity Lifecycle, Broadcast receivers, Services and Manifest 3.2 Creating Application and new Activities 3.3 Expressions and Flow control, Android Manifest 3.4 Simple UI -Layouts and Layout properties <ul style="list-style-type: none"> <li>• Fundamental Android UI Design</li> <li>• Introducing Layouts</li> <li>• Creating new Layouts</li> <li>• Drawable Resources</li> <li>• Resolution and density independence (px,dip,dp,sip,sp)</li> </ul>
	3b. Use GUI Objects to develop applications	3.5 XML Introduction to GUI objects viz. <ul style="list-style-type: none"> <li>• Push Button</li> <li>• Text / Labels</li> <li>• EditText</li> </ul>



Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		<ul style="list-style-type: none"> <li>• ToggleButton</li> <li>• WeightSum</li> <li>• Padding</li> <li>• Layout Weight</li> </ul>
<b>Unit – IV</b> <b>Advanced UI Programming</b>	4a. Develop event driven Programming in Android	4.1 Event driven Programming in Android (Text Edit, Button clicked etc.) 4.2 Creating a splash screen 4.3 Android Activity Lifecycle 4.4 Introduction to threads in Android
<b>Unit – V</b> <b>Toast, Menu, Dialog, List and Adapters</b>	5a. Develop application with menus and dialog boxes	5.1 Menu: Custom Vs. System Menus 5.3 Creating and Using Handset menu Button (Hardware) 5.4 Android Themes, Dialog, create an Alter Dialog 5.5 Toast in Android, List & Adapters 5.6 Android Manifest.xml File Update
<b>Unit - VI</b> <b>Working with Database</b>	6a. Develop applications with database	6.1 SQLite: Open Helper and create database 6.2 Open and close a database

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

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Android OS: Concepts	06	4	4	2	10
II	Android Architecture	06	4	4	2	10
III	Android Activities and UI Design	10	4	7	7	18
IV	Advanced UI Programming	10	4	2	4	10
V	Toast, Menu, Dialog, List and Adapters	08	4	4	6	14
VI	Work with Database	04	2	4	2	08
	<b>Total</b>	<b>42</b>	<b>22</b>	<b>25</b>	<b>23</b>	<b>70</b>

**Legends:** R = Remembrance; U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

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

## 7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises 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/exercises. However, if these practical/exercises 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.*

### Example Practical list is followed with this suggested list of exercises

Sr. No.	Practical Exercises	Hrs. Required
1	Create “Hello World” application to “Hello World” in the middle of the screen in the red color with white background.	4
2	Create sample application with login module.(Check username and password), validate it for login screen or alert the user with a Toast.	4
3	Create and validate a login application using username as Email ID else login button must remain disabled.	2
4	Create and Login application and open a browser with any one search engine.	2
5	Create an application to display “Hello World” string the number of times user inputs a numeric value. (Example. If user enters 5, the next screen should print “Hello World” five times.)	4
6	Create spinner with strings from the resource folder (res >> value folder). On changing spinner value, change image.	4
7	Create an application to change screen color as per the user choice from a menu.	4
8	Create an application that will display toast (Message) at some regular interval of time.	4
9	Create a background application that will open activity on specific time.	4
10	Create an application that will have spinner with list of animation names. On selecting animation name, that animation should affect on the images displayed below.	4
11	Create an UI listing the diploma engineering branches. If user selects a branch name, display the number of semesters and subjects in each semester.	4
12	Use content providers and permissions by implementing read phonebook contacts with content providers and display in the list.	4
13	Create an application to call a phone number entered by the user the Edit Text.	4
14	Create an application that will create database to store username and password.	4
15	Create an application to insert, update and delete a record from the database.	4
Total Hours		56

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

- i.Design sample GUI
- ii.Present the developed application on a mobile device
- iii.Present paper in a Seminar on Open Source Technology

## 6. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Faculty should demonstrate an Open source technology specifically java and should give some clear understanding of mobile technology using some simulation or pictorial representation.

## 7. SUGGESTED LEARNING RESOURCES

### List of Books

Sr. No.	Title of Book	Author	Publication
1	Professional Android 2 Application Development	Reto Meier	Wiley India Pvt Ltd
2	Beginning Android	Mark L Murphy	Wiley India Pvt Ltd
3	Professional Android	Sayed Y Hashimi and Satya Komatineni	Wiley India Pvt Ltd

### Suggested Readings

1. Android Studio Development Essentials by Neil Smyth
- C)The Definitive Guide to SQL Lite by Michael Owens

### B) List of Major Equipment/ Instrument with Broad Specifications

- Computer System with latest configuration
  - Internet
  - Open Source Software
  - Android Open Source Project, Android SDK, Eclipse Environment
- Additional Resources of Android that can be used for conducting Practical as well as case studies**
- <http://developer.android.com/tools/sdk/eclipse-adt.html> [developer.android.com/sdk/installing/installing-adt.html](http://developer.android.com/sdk/installing/installing-adt.html) <https://www.eclipse.org/downloads/>

## 11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

### Faculty Members from Polytechnics

12. Parvez Faruki, I/C Head and Lecturer, IT, Sir BPTI Bhavnagar
13. Amit Shah, Lecturer, Information Technology, L.J Polytechnic, Ahmedabad
14. Nandu Fatak, Lecturer, Information Technology, Sir BPTI, Bhavnagar.

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr. Sanjay Agrawal**, Professor, Department of Computer Engineering and Applications, NITTTR, Bhopal
- **Prof. Shailendra Singhm** Professor, Computer Engineering, NITTTR Bhopal.

## GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

### COURSE CURRICULUM COURSE TITLE: WEB DESIGNING USING PHP AND MYSQL (COURSE CODE: 3361603)

Diploma Program in which this course is offered	Semester in which offered
Information Technology	SIXTH

#### 6. RATIONALE

PHP is a powerful tool for making dynamic and interactive database driven web pages. PHP is the widely-used as efficient open source technology. The students of diploma in Information Technology as web developers would be able to write dynamic interactive web based applications such as for online banking, ticket/hotels booking sites, E-Commerce using PHP and MYSQL database.

#### 5. COMPETENCIES

**The course content should be taught and implemented with the aim to develop required skills so that students are able to acquire following competency:**

**i. Develop interactive web based application using PHP and MYSQL**

#### 5. 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.

- Create small programs using basic PHP concepts.
- Apply In-Built and Create User defined functions in PHP programming.
- Design and develop a Web site using form controls for presenting web based content.
- Debug the Programmes by applying concepts and error handling techniques of PHP.
- Create dynamic Website/ Web based Applications, using PHP, MySQL database

#### 6. 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	
3	0	4	7	70	30	40	60	200

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

#### 8. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I</b> <b>Introduction to PHP</b>	1a. Identify relationship between Apache, MySQL and PHP 1b. State steps to Install & test web server 1c. State Steps to Configure Apache to use PHP 1d. Create simple PHP page using PHP structure and Syntax. 1e. List and state use of PHP variables, data types . 1f. Describe use of PHP Operators. 1g. Apply control structures in programming 1h. State the steps to use different types of array in given application 1i. State the steps to create user defined functions	1.1 Configuration of PHP, Apache Web Server, MySQL and Open Source 1.2 Relationship between Apache, MySQL and PHP(AMP Module) 1.3 Installing PHP for (Windows, Wamp server , XAMP server), 1.4 PHP Structure and Syntax 1.5 Creating PHP pages 1.6 Rules of PHP syntax 1.7 Integrating HTML with PHP 1.8 Constants , Variables: Static and Global Variable 1.9 Conditional Structure and Looping, PHP operators 1.10 Arrays, constructs 1.11 User Defined function, argument function, variable function, Return function, default argument, variable length argument
<b>Unit – II</b> <b>Working With In Built Functions</b>	2a. Apply various InBuilt Variable, String, MATH, Date, Array, File Functions in programming	2.1 Variable Function: (gettype, settype, isset, strval, floatval, intval, print_r) 2.2 string function: (Chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, trim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, str_replace, stripslashes, echo, print) 2.3 MATH functions: (Abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand) 2.4 Date function: (Date, getdate, setdate, checkdate, time, mktime) 2.5 Array Function: (Count, list, in_array, current, next, previous, end, each, sort, array_merge, array_reverse) 2.6 File function: (Fopen, fread, fwrite, fclose)
<b>Unit – III</b> <b>Working with data and forms</b>	3a. State the steps to Create an input form 3b. State the steps to use Using PHP \$_Get and \$_Post, \$_Request method for a given application	3.1 Reading data using Form Controls (Text Fields, Text Areas, CheckBoxes, Radio Buttons, List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads, Buttons) 3.2 Submitting form values, using

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		\$_Get and \$_Post Methods, \$_REQUEST 3.3 Accessing form inputs with <i>Get/Post</i> functions 3.4 Combining HTML and PHP codes together on single page, Redirecting the user
<b>Unit - IV Session, Cookies and Error Handling</b>	4a. Use cookie to store and retrieve data 4b. Use querystring to transfer data 4c. Create session variable and handle session 4d. Handle runtime errors through exception handling	4.1 Setting a cookie with PHP, Deleting a cookie 4.2 Creating session cookie 4.3 Working with the query string Creating query string 4.4 Session 4.5 Starting and Destroying session 4.6 Working with session variables , Passing session IDs 4.7 Error Types in PHP 4.8 Exception Handling in PHP
<b>Unit - V Database Connectivity using MYSQL</b>	5a. Describe/ State MySQL structure and Syntax 5b. Discuss types of MySQL tables and storage engines 5c. Apply/Use various MySQL commands on database 5d. State steps to connect with database using PHP and MYSQL 5e. Write MySQL commands to Insert, Update, Delete records 5f. Describe steps for hosing a Website using 'C' panel and Filezilla software	5.1 Concepts and Installation of MySQL 5.2 MySQL structure and syntax 5.3 Types of MySQL tables and Storage engines 5.4 MySQL commands 5.5 Integration of PHP with MySQL 5.6 Connection to the MySQL Database 5.7 Creating and Deleting MySQL database using PHP 5.8 Updating, Inserting, Deleting records in the MySQL database 5.9 Hosting Website (Using 'C' panel, Using Filezilla Software)

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

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	<b>Introduction to PHP</b>	6	4	8	2	14
II	<b>Working With Functions</b>	6	4	6	4	14
III	<b>Working with DATA and Forms</b>	9	2	6	6	14
IV	<b>Cookie, Session and Error Handling</b>	9	4	8	2	14
V	<b>Database Connectivity using MYSQL</b>	12	2	6	6	14
	<b>Total</b>	<b>42</b>	<b>16</b>	<b>30</b>	<b>24</b>	<b>70</b>

**Legends:** R = Remembrance; U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

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

## 7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises 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/exercises. However, if these practical/exercises 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.*

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hrs. required
1	I	Write a PHP script to display Welcome message.	2
2		Write a PHP script to demonstrate arithmetic operators, comparison operator, and logical operator.	2
3		Write PHP Script to print Fibonacci series.	2
4		Write PHP Script to generate result and display grade.	2
5		Write PHP Script to find maximum number out of three given numbers.	2
6		Write PHP Script for addition of two 2x2 matrices.	2
7	II	Write PHP script to demonstrate Variable function.	
8		Write PHP script to obtain 5! Using function	2
9		Write PHP script to demonstrate string function.	2
10		Write PHP script to demonstrate Date functions.	2
11		Write PHP script to demonstrate Math functions.	2
12		Write PHP script to demonstrate Array functions.	
13		Write PHP script to demonstrate File functions.	
14	III	Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.	2
15		Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.	2
16	IV	Write two different PHP script to demonstrate passing variables through a URL.	2
17		Write two different PHP script to demonstrate passing variables with sessions.	2
18		Write PHP script to demonstrate passing variables with cookies.	2



Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hrs. required
19	V	Write a program to keep track of how many times a visitor has loaded the page.	2
20		Write an example of Error-handling using exceptions.	2
21		Write a PHP script to connect MySQL server from your website.	2
22		Write a program to read customer information like cust_no, cust_name, Item_purchase, and mob_no, from customer table and display all these information in table format on output screen.	2
23		Write a program to edit name of customer to “Bob” with cust_no =1, and to delete record with cust_no=3.	2
24		Write a program to read employee information like emp_no, emp_name, designation and salary from EMP table and display all this information using table format.	2
25		Create a dynamic web site using PHP and MySQL.	8
Total Practical Hours			56

## 11. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

- i. Prepare power point presentation showing relation between PHP, APACHE and MYSQL.
- ii. Develop sample web based Application using PHP and MYSQL and present the same.

## 12. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- i). Concepts will be introduced in classroom input sessions and by giving demonstration through projector.
- ii). More focus should be given on practical work which will be carried out in laboratory sessions. The course activities include:
  - Formal Lecture: 40% (approx.) Supervised Laboratory Experiences: 60% (approx.) If possible theory sessions may be conducted in labs so that theory and practice can go hand in hand.
  - Group Discussion and presentation of live websites

## 10. SUGGESTED LEARNING RESOURCES

### A) List of Books

S. No.	Title of Book	Author	Publication
1	Beginning PHP and MySQL, 4 <sup>th</sup> Edition	W. Jason Gilmore	Apress, 2010
2	PHP: The Complete Reference	Steven Holzner	McGraw-Hill, 2008
3	Learning PHP, MySQL, JavaScript, CSS & HTML5,	Robin Nixon	O'reilly Media , 2014

	Third Edition		
4	Teach yourself PHP, MySQL and Apache All in One , 5 <sup>th</sup> Edition	Julie C. Meloni,	Pearson Education, 2012

### B) List of Major Equipment/ Instrument with Broad Specifications

1. Computer System with latest configuration, Server with latest specification, broadband or leased line connection
2. Multimedia Projector

#### □ List of Software/Learning Websites

Software: WAMP server / XAMPP server, 'C' Panel, Text Editor

- 3) <http://www.codecademy.com/tracks/web> ,
- 4) <http://www.codecademy.com/tracks/php>
- 5) <http://www.w3schools.com/PHP>
- 6) <http://www.tutorialpoint.com>
- v. <http://www.homeandlearn.co.uk>

## 11. COURSE CURRICULUM DEVELOPMENT

### COMMITTEE Faculty Members from Polytechnics

- Mrs. Rikita Dhaval Parekh, Lecturer ( IT ), Government Polytechnic For Girls, Ahmedabad
- Mr. Ankit Limkar, Lecturer IT, L J Polytechnic, Ahmedabad

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- 1) Dr. K. James Mathai, Associate Professor, Dept. of Computer Engineering and Applications NITTTR, Bhopal
- 2) Dr. M A Rizvi, Professor, Computer Engineering Department, NITTTR, Bhopal