GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE:COMPUTER MAINTENANCE AND TROUBLE SHOOTING
(COURSE CODE: 3350701)

Diploma Programmes in which this course is offered	Semester in which offered
Computer Engineering	5th Semester

1.   RATIONALE

For the smooth functioning of computer system it is frequently required to upkeep, maintain, repair, troubleshoot and take up preventive maintenance of the system and its peripheral devices. Therefore it is essential for the students to acquire skills in the area of computer maintenance and troubleshooting and its preventive maintenance.

This course is focused on developing skills in installation and configuration of Operating systems, loading and configuring various device drivers, diagnosing the faults and troubleshoots the computer at software level as well as component level. This course will be helpful for students to get employment in the computer maintenance industry as well as self employment.

2.   LIST OF COMPETENCY

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

- **Identify faults, troubleshoot, repair and do preventive maintenance of computer system and its peripherals**.

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.   Install, configure Operating Systems and device drivers.
   ii. Install, configure and maintain various components in computer system and peripheral devices.
   iii. Diagnose faults, repair and maintain computer system and its peripherals.

4.   TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	150
3	0	2	5	70	30	20	30	

Legends: **L**-Lecture; **T** – Tutorial/Teacher Guided Theory Practice; **P** - Practical; **C** – Credit **ESE** - End Semester Examination; **PA** - Progressive Assessment.

5. COURSE CONTENT DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Inside the PC: Core Components	1a. List and Identify the components of computer sytem 1b. State devices required for using laptops 1c. List ports and connecting devices 1d. Draw and explain the functional block diagram of motherboard	1.1 Identify different type and generation of computer, Identify devices required for using laptops, Identify components which makes the system and specify its importance. Identify various types of ports and its connecting devices. Motherboard: definition, Components/connections in motherboard, functional block diagram
	1e. Explain functionality and features of CPU 1f. Differentiate types of motherboards preprocessors	1.2 Central Processing Unit (CPU): CPU Speeds, Word Size, Data Path, Internal Cache memory, Slots and sockets, CISC vs RISC processor, CPU chips preprocessors motherboard Types/Form Factors (AT, Baby AT, ATX, LPX, NLX, BTX)
	1g. Describe bus slots and cards 1h. Define System Controller	1.3 Expansion Buses (Definition, Bus Architecture (PC/PC-XT, PC-AT/ISA, EISA, MCA, VESA Local (VL) Bus, PCI, Combination of Bus Systems, AGP – Accelerated Graphics Port, Universal Serial Bus (USB), IEEE 1394 Fire Wire- A Bus Standard 1.4 System Controller : Definition
	1i. Explain BIOS features	1.5 Basic Input Output System :Services, Bios Interaction, CMOS-RAM
	1j. List advantages of Chipsets	1.6 Chipsets : Definition, Advantage, North and South Bridge
	1k. List features of different types memory modules	1.7 System Memory : definition, memory sizes, speeds and shapes (DIP, ZIP, SIPP, SIMM, DIMM, RIMM), Memory modules (Dynamic RAM, SDRAM, DDR SDRAM, SLDRAM, DRDRAM, Fast Page Mode (FPM) DRAM, Extended Data Out(EDO) DRAM)
Unit– II Hard Disk Drive and Controller, DVD Drives	2a. Define: Heads, Tracks, Sectors, Cylinders, Cluster, Landing zone, MBR, Zone bit recording . 2b. Describe functioning of hard disk.	2.1 Disk Basics 2.2 Hard Disk Interfaces: EIDE, Serial ATA, SCSI, USB and IEEE 1394 (Firewire), RAID, Solid State Drive (laptop) 2.3 Disk Geometry : Heads, Tracks, Sectors, Cylinders, Cluster, Landing zone, MBR, Zone bit recording

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	2c. Describe the parameters of performance characteristics of hard disk	2.4 Disk performance Characteristics: Seeks and Latency, Data Transfer Rate
	2d. Explain the working of hard disk controller	2.5 Hard Disk Controller: Functional Blocks, HDC Functions
	2e. Explain types of DVD, recording and constructions	2.6 DVD Drives : Types, Recording, Construction, Interfacing,
	2f. Describe the DVD drive performance criteria	2.7 DVD Drive Performance Criteria : Data Transfer Rate, Access time, Cache/buffer
	2g. list blu-ray disk specification	2.8 Blu-ray disk specification
Unit– III Input Devices and Printers	3a. Explain operation of keyboard 3b. Explain operation of mouse 3c. Explain working of scanner	3.1 Keyboard : Keyboard operation, Keyboard Types , Types of Key switches (Membrane, mechanical, rubber dome, capacitive) 3.2 Keyboard interfaces 3.3 Mouse : Types, Operation, Interfaces 3.4 Scanner : Scanner Types, Image quality measurement, Working
	3c. Classify printer 3d. Describe the working of LaserJet and Ink-jet Printer .	3.5 Types of Printers 3.6 Printer Interfaces 3.7 Ink-jet Printer : Parts, working principle 3.8 LaserJet Printer : Parts, working principle
Unit– IV Monitor and Display Adapters	4a. Define video basics (CRT parameters) and VGA monitors	4.1 Video Basics (CRT parameters) 4.2 VGA monitors
	4b. Differentiate digital display technologies 4c. State the appropriate applications of digital display	4.3 Digital Display Technology- Thin Displays, Liquid Crystal Displays, Plasma Displays, Light Emitting Displays
	4d. Differentiate graphic cards 4e. Explain their applications	4.4 Graphics Cards : Components of a card, Accelerated Video cards, CGA, EGA, VGA
Unit– V Trouble Shooting and Preventive Maintenance	5a. Explain POST sequence	5.1 POST : Functions, IPL Hardware, Test Sequence, Error messages
	5b. Explain troubleshooting procedures of listed peripherals and motherboard	5.2 Troubleshooting : possible problems and diagnosis • Motherboard • Keyboard • Hard Disk Drive • Printer

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	5c. Discuss preventive maintenance techniques 5d. List the Preventive maintenance tools	5.3 Preventive maintenance tools

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

Unit No.	Unit Title	Teaching Hours	R Level	U Level	A Level	Total Marks
I	Inside the PC: Core Components	11	04	06	08	18
II	Hard Disk Drive and Controller, DVD Drives	07	04	04	04	12
III	Input Devices and Printers	07	04	06	04	14
IV	Monitor and Display Adapters	07	03	07	00	10
V	Trouble Shooting and Preventive Maintenance	10	00	10	06	16
	Total	**42**	**15**	**33**	**22**	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's Revised 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/PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills (**Outcomes in cognitive, psychomotor and affective domain**) so that students are able to acquire the required competencies.
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 **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain*

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. required
1	I	Identify basic components of a personal computer. Prepare a list of various computer peripherals. (e.g. CPU, Monitor, Keyboard, Mouse, Speaker, Web cam, Printer, Scanner, microphone, speakers, modem, projector etc).	01
2	I	Identify common ports, associated cables, and their	01

		connectors. Observe various connectors, ports back and front side of the computer. Write their purpose and specifications. (e.g. Power, PS/2 keyboard and mouse, Serial and parallel, USB, VGA, LAN, Audio & microphone, Firewire, HDMI, games, SATA etc.)	
3	I	Identify major components including motherboards, memory, drives, peripheral cards and devices, BIOS, and Windows operating system. Observe the various components on the motherboard, identify it. Also observe their interconnection and arrangement inside the case. Detach and attach the cables and component in the PC case and motherboard. Carryout detailed study on all the components and devices on the given motherboard. • Processor socket ,Chipsets, • Memory module slots, BIOS, CMOS • FDD, HDD connectors • Different types of expansion slots (ISA, EISA, PCI, PCI express, AGP, Express Card & PC Card (or PCMCIA) etc.) • Add-on-cards (audio, graphics, I/O, TV tuner, network etc.) • Cables in a computer system (IDE Ribbon cable, SATA cable etc) • Connections for button, indicator lights etc. • Observe various types of memory modules (SIMM, DIMM, SO-DIMM, RIMM, SO-RIMM). Also observe impact of removal of memory modules from the system, start it and re insert memory module and restart system. • Disassemble the PC carefully. Assemble the same PC you have disassembled and boot the system. Observe the procedure of assembling a computer system.	02
4	I	Observe the different types of motherboards, form factors and write the difference between the desktop motherboard and laptop motherboard, all in one desktop motherboard, server motherboard. (e.g Full size AT, baby AT, ATX, LPX, NLX etc)	02
5	I	Identify the on-board features of the motherboard. Add additional facilities like the network capabilities, and gaming capabilities by adding an Accelerator card. Install the given driver and test the computer for proper functioning. Remove the drivers for some devices like sound, display, network etc. and again install them and check the proper functioning of computer. Upgrade the given PC by adding RAM and additional Hard Disk.	02
6	II	Observe, search and write the specifications of CD/DVD	Homewo

		drive, HDD, motherboard, RAM chips, Power supply, Microprocessor chip, Add on cards. Prepare complete specifications of the latest system configuration available in the market.	rk
7	II	Observe the power supply (SMPS) and measure their voltage levels of a given SMPS. Measure various voltage levels, such as motherboard, storage devices and fan etc. using multi-meter. Do a detailed study on all the components and devices on the given power supply. Observe different types of switch mode Power Supply – AT, ATX, NLX . Record the different types of power connectors on the motherboard.	02
8	II	Observe various secondary storage systems- Hard Disk, Flash drives, CD/ DVD drive. Open drives and draw the internal structure of them. (If available Also open the various FDD/HDD disks to observe the magnetic disk inside.)	02
9	II	Observe the various techniques for low level and high level formatting of Hard Disk. Format the given Hard Disk using any one technique and create three partitions, two for operation systems and one for data.	01
10	II	Observe the procedure for installing Operating System like win7/win8 with partition formatted in previous practical in one partition, (fat, fat16, fat32, ntfs, gpt). Try booting PC. Learn the content of boot.ini after the installation process. Now install unix Operating System like Linux /Ubantu/ centos/ fedora/ red hat in another partition. Create dual booting system try booting PC. Learn the content of boot.ini after the installation process.	02
11	III	Open at least 2 to 3 different types of keyboard and mouse and observe the internal circuits. Observe and write steps to troubleshoot, maintain and clean the diskette drives, keyboard, mouse, etc.	02
12	III	Observe different types of printers (dot matrix, inkjet & laser, multifunction). Install driver and interface the printers with PC/Laptop on any operating system (connect the printer to one PC directly using USB/Serial/Parallel ports as per the availability; test the functioning of the printer.) Write detailed comparative analysis of different types of printer available in the market and suggest a printer with good features and best price as per need. Justify your printer selection.	02
13	III	Observe the interfacing, installation and working of various devices such as scanner, projector, web cam etc. Connect all these devices with the given PC, install & test them.	02
14	V	Identify BIOS settings. (strictly under the observation of Instructor) • Define BIOS. • Demonstrate starting BIOS. • Identify how to disable unused devices to decrease	02

		security risks. • Change booting of computer with different secondary storage CD, HDD, USB etc.	
15	V	Identify the problem in the given PC, using the given troubleshooting sequence, fix the issue, record the given problem, and produce proper documentation of your work	02
16	V	Recognize common symptoms associated with diagnosing and troubleshooting PCs and utilize Windows built-in diagnostic tools. • Identify general troubleshooting techniques and strategies • Utilize scandisk, control panel, boot-up menu, and startup disk as diagnostic tools. • Access Microsoft Knowledge Base on the Internet to solve common problems. • Identify the common problems associated with shutdown, configuration, and cabling. • Identify problems associated with heating and cooling of the internal components. • Identify problems with installing internal devices such as hard drive, tape drives, or CD-ROM drive. • Recognize and interpret the meaning of common error codes and startup messages. • Recognize windows-specific printing problems and corrections.	02

17	V	Log boot ups and events.
		 • Describe the purpose of logging system events.
		 • Correlate an event with a job and session.
		 • Describe how the SLOG command enables and disables the selected system logging events.
		 Define registry file operation and maintenance.
		      • Describe registry file operations.
		      • Demonstrate proper registry file maintenance practices.
		      • Demonstrate how to remove unwanted software applications.
			02

18	V	Search for various data recovery software apply on pen drive/HDD.	02

19	V	Perform computer maintenance and preventative maintenance functions.
		      • Perform physical cleaning (internal and external) of personal computer.
		      • Demonstrate how to adjust basic performance settings.
		      • Perform hard drive file system maintenance.
		      • Identify anti-virus software and applications.
		      • Identify diagnostic software such as Norton Utilities.
		 (Discuss the system maintenance & troubleshooting. Create policies, quality check forms and create a standard
			02

		procedure to reduce the maintenance job. Conduct the Preventive maintenance and troubleshooting of repaired PCs in the laboratories, create detailed plan to conduct the work in the stipulated time. Create a detailed report of your work.)	
20	V	Utilize Internet to download device drivers. Installation of drivers of various devices from the internet.	02
21	V	Demonstrate to remove unwanted software applications.	01
22	V	Operate and maintain registry file . • Describe registry file operations. & demonstrate proper registry file maintenance practices.	02
23	V	Log boot ups and events. • Describe the purpose of logging system events. • Correlate an event with a job and session. • Describe how the SLOG command enables and disables the selected system logging events.	02
Total (practical for 28 hours from above representing each unit may be selected)			**42**

8.   SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

i. Survey of computer system, laptops, servers and peripherals available in the market to get awareness of the technology being used and their specifications.
ii. Prepare comparative charts as outcome of survey done.
iii. Seminar presentation on various peripherals and it's working.
iv. Industry visit to a company or workshop where maintenance are carried out.
v. Prepare charts for various types of CPU and input/output devices available in market.

9.   SPECIAL INSTRUCTIONAL STRATEGIES (If Any)

The course activities should include Lectures and Practical Exercises with sufficient hands on as per teaching scheme. Following instructional strategies should be followed to cover the content:

i. Concepts should be introduced in input sessions using multimedia projector.
ii. More focus should be given on Practical work through laboratory sessions.
iii. Discussion sessions.
iv. Demonstrations.
v. Power point presentation to explain construction and functioning of various devices and components.
vi. Debate/Group Discussions for comparison of various peripherals and computer systems

10.   SUGGESTED LEARNING RESOURCES

A)   List of Books

S. No.	Title of Book	Author	Publication
1.	Computer Installation and Servicing	D Balasubramanian	Tata McGraw Hill Education Private Limited
2.	The complete PC Upgrade & Maintenance Guide	Mark Minasi	BPB Publications
3.	IBM PC and clones	Govind Rajalu	Tata McGraw Hill Education Private Limited

B) List of Major Equipment/ Instrument with Broad Specifications
   i.   Desk top computer system, laptops, servers with latest configuration.
   ii.   All peripheral maintenance kits (motherboard, keyboard, DVD, mouse, HDD etc)
   iii.   Preventive maintenance kit
   iv.   Disk cleaning kit
   v.   diagnostic software/tools, preferably open source based
   vi.   Internet Access
   vii.   Library resources

C) List of Software/Learning Websites

   i.   Software: Microsoft windows operating system from XP/vista/7/8 to latest version available in market, Windows server, linux/ubuntu/centos, server operating system
   ii.   http://www.gcflearnfree.org/computerbasics/15/print
   iii.   http://www.more.net/sites/default/files/training/BTTmain.pdf
   iv.   http://www.computerhope.com/issues/ch000248.htm
   v.   http://www.youtube.com/watch?v=Wk0m6TlO8X4
   vi.   http://computer.howstuffworks.com/computer-hardware-channel.htm

11.   COURSE CURRICULUM DEVELOPMENT COMMITTEE
Faculty Members from Polytechnics
- **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, Ahmdeabad
- **Prof. Manisha P Mehta,** Sr. Lecturer in Computer Technology, K. D. Polytechnic, Patan
- **Prof. R. M. Shah,** Sr. Lecturer in Computer Technology, Government Polytechnic, Ahmedabad

Coordinator and Faculty Members from NITTTR Bhopal

- **Dr. M. A. Rizvi,** Associate Professor, Dept. of Computer Engineering and Applications,
- **Dr. R. K. Kapoor**, Associate Professor, Dept. of Computer Engineering and Applications,

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: DYNAMIC WEB PAGE DEVELOPMENT
(COURSE CODE:3350702)

Diploma Programmes in which this course is offered	Semester in which offered
Computer Engineering	5th Semester

1.   RATIONALE

One of the most common types of dynamic web pages is the database driven type. Common Applications of such technology are online banking, ticket/hotels booking sites, E-Commerce and online transaction processing systems etc.

PHP is a powerful tool for making dynamic and interactive database driven web pages. PHP is the widely-used as efficient open source technology alternative to competitors. The goal of the language is to allow web developers to write dynamically generated pages quickly. This course covers basic concepts for developing interactive web based applications; including HTML, server side scripting, user interface design considerations, and system integration considerations and PHP with MYSQL database. Students will learn integration of HTML, PHP with MYSQL database to develop web based applications. Overall the students will gain the experience in designing and implementing working prototypes of web pages, web sites, and interactive dynamic web-based applications. The course will also be useful as prerequisite to forthcoming web development subjects.

2.   COMPETENCY

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

- **Develop interactive web based application using HTML, CSS, PHP and MYSQL**

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. Design and develop a Web page using HTML.

ii. Style your page using CSS, internal style sheets, and external style sheets.

iii. Develop Web page using different form elements.

iv. Design and develop a Web site using text, images, links, lists, and tables for presenting web based content.

v. Create dynamic Website/ Web based Applications. using HTML, PHP, MYSQL database

vi. Debug the Programmes by applying concepts and error handling techniques of HTML, PHP, MYSQL.

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4.   TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical 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 Theory Practice; **P** - Practical; **C** – Credit
ESE - End Semester Examination; **PA** - Progressive Assessment.

5.   COURSE CONTENT DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit 1 : Introduction to Html and CSS	1a. Design and develop web pages using basic HTML tags	1.1 History of Html 1.2 Basic Html Tags (<html>,<head>,<title>,<body>,<hr>,<img>,<embed>,<bgsound>,<blink>,<font>,<center>,<marquee>,<a>) 1.3 Coding style ,syntax, Working with Image, Linking a webpage , Defination list (, ,) 1.4 Working with Table (<th>, <td>, <tr>) 1.5 Division Tags, IDs & Classes 1.6 Special Character or tags
	1b. Use of advance HTML 5 Tags. 1c. Design Static Webpage using Html5 tags	1.7 Difference between Html 4.0 & 5.0 1.8 Brief Discuss Html 5 tags with Ex. (<header>, <aside>, <section>, <footer>, <article>,<nav>) 1.9 Introduction to Html5 Form Input Type ,Elements & Attributes. 1.10 Form Input Type (color, Date, Datetime, Datetime-local, email, month number, range, search, tel, time, url, Week) 1.11 Form Input Type Elements(Datalist, Keygen, output) 1.12 Html5 video & audio(<Audio>, <Video>) 1.13 Static Webpage Design using Html5 tags
	1d. Design and develop web pages using CSS/ CSS 3 styles, internal and/or external style sheets.	1.14 Introduction to Css/dhtml 1.15 Briefly Discuss to stylesheet (What is Css? ,Use of Css, Type's of Css, Syntax)

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		1.16 Css margin, padding , Text, Font Properties 1.17 Css and links 1.18 Css Background, Border Properties, Height, width, Css Positioning, Layout creating 1.19 Css and backgrounds, Css and borders, Float Properties, Css video, audio Tag, Map Creating 1.20 Diff. between Css2 & Css3 1.21 Css3- Opacity, Box-Shadow, Border- radius, Gradient, Transition, Transform , Animation , Keyframes
Unit – II Working with Basic Building Blocks of PHP	2a. Understand PHP file structure 2b. States the steps to Install & test web server 2c.Describe the working of PHP 2d. State Steps to Configure Apache to use PHP	2.1 Introduction to PHP 2.2 A Brief History of PHP 2.3 How PHP works?, PHP file structure, PHP start and end tags, Commenting codes (Single line, Multi line) 2.4 Creating and saving a PHP file 2.5 Output statement, echo and print statement 2.6 Installing PHP for (Windows, Wamp server , linux , Lamp server, XXAMP server), Configuring Apache to use PHP, Testing the PHP Installation
	2e. Use PHP variables, data types and operators. 2f. Describe PHP Operators	2.7 PHP Variable and value types, data types, changing types with settype(), casting 2.8 PHP Operators (Arithmetic, Logical, Bitwise, Assignment, String, Inc/ Decrement, Comparison) 2.9 Operator precedence, constants, predefined constants
	2d. Apply control structures in programming	2.10 Flow control statements: The simple if statement, the if-else statement, else if clause, switch statement, The ? operator 2.11 Loops: the While statement, do.. While statement, For statement, breaking out with break statement, continue statement, nesting loops.
Unit – III Working with PHP Arrays and functions	3a. State the steps to use different types of array in given application 3b. State the steps to create user defined functions and working with	3.1 Array: Types of Array, Arrays definition, Creating arrays; using arrays() function, using Array identifier, defining start index value, adding more elements to array, 3.2 Associative arrays, key-value pair,

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	different type of built-in functions for a given application	using for-each statement to go through individual element with loop. 3.3 Functions: defining a user defined function, calling function, returning values from function, Variable scope, Accessing variables with *global* statement, 3.4 Setting default values for arguments, passing with values and passing with reference, 3.5 Working with string, Dates and Time functions, common mathematical functions
Unit-IV User data input through Forms	4a. State the steps to Create an input form 4b. State the steps to use Using PHP superglobals method for a given application	4.1 Input through Form controls- using Text Box, Text Area, List Box, Check Box, Radio Box, Hidden Fields 4.2 Submitting form values, using $_*Get* and $_*Post* Methods, $_REQUEST 4.3 Accessing form inputs with *Get/Post* functions 4.4 Combining HTML and PHP codes together on single page, Redirecting the user
	4c. List the steps to Create and manage session	4.5 Basics of cookies, Using Cookies and maintaining Session 4.6 Using Cookie Variable, Using Cookies with Authentication 4.7 Understanding sessions and Session Variable 4.8 Starting a session, Registering and modifying Session Variable 4.9 Managing user preferences with session
Unit – V Establishing a Database Connection and Working With Database	5a List the steps to Establish a connection with database	5.1 Overview of Database 5.2 Introduction to MYSQL 5.3 Creating Database using phpmyadmin & Console(using query, using Wamp server)
	5b. State the steps to create tables and Manipulating tables data using SQL	5.4 Connecting with PHP/ Database Connection, creating and executing queries using *mysql_query()*, 5.5 creating tables, inserting data in to table, inserting data through HTML Forms

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		5.6 Retrieving data from Table, using *mysql_numrows(),* Printing the output using PHP and HTML 5.7 Searching a record, displaying record fields in HTML form controls, Updating and deleting records
	5c. Describe steps for hosing a Website using 'C' panel and Filezilla software	5.8 Hosting Website (Using 'C' panel, Using Filezilla Software) 5.9 Working on mini PHP Project: Developing a sample web based application and hosting it

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	Introduction to Html and CSS	8	3	3	4	10
II	Working with Basic Building Blocks Of PHP	10	4	4	6	14
III	Working with PHP Arrays and functions	6	2	4	10	16
IV	User data input through Forms	8	2	4	8	14
V	Establishing a Database Connection and Working With Database	10	4	4	8	16
	Total	**42**	**15**	**19**	**36**	**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/PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills (**Outcomes in cognitive, psychomotor and affective domain**) so that students are able to acquire the competencies.
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 Programme Outcomes/Course Outcomes in affective domain as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. required
1	I	Write HTML codes for displaying image and demonstrate hyper linking.	02
2	I	Write HTML codes to attach video on webpage using embed tag in html	02
3	I	Create A Feedback Form Using Form handling.	01
4	I	Create a contact form using form handling.	01
5	I	Write a code for creating static page design using division tag	02
6	I	Write a code for design menu system using list tag	02
7	I	Design Google Page using HTML5	02
8	I	Apply CSS formatting to created pages and explore it fully, also use readymade css templates.	06
9	II	Write a PHP script to display Welcome message. Write a PHP script to demonstrate use of arithmetic operators, comparison operators, and logical operators.	03
10	II	Write a PHP script to get type of variable using gettype() Write a PHP script to set type of variable using settype()	01
11	II	Write a PHP script to set type of variable using type casting	01
12	II	Write PHP Script to print Fibonacci series. Write PHP Script to calculate total marks of sudent and display grade. Write PHP Script to find maximum number out of three given numbers.	03
13	III	Write PHP Script using two dimensional arrays such as addition of two 2x2 matrices. Write PHP Script to demonstrate use of associative arrays and for FOR EACH loop execution.	03
14	III	Write PHP script Using user defined function Write PHP script to demonstrate use of string function.	03
15	III	Write PHP script to demonstrate use of date/time functions and Math functions.	02
16	IV	Create form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page (e.g. student registration/inventory/library form).	03
17	IV	Write two different PHP script to demonstrate passing variables through a URL Write two different PHP script to demonstrate passing variables through Hidden Variables.	04
18	IV	Write two different PHP script to demonstrate passing variables with sessions Write PHP script to demonstrate passing variables with cookies	04

		Write a program to keep track of how many times a visitor has loaded the page.	
19	IV	Write a Program to upload image with extension gif or jpeg. Write a PHP script to create watermarks using *Imagecopymerge*. Write a PHP script to convert images to grayscale.	04
20	V	Write a PHP script to connect MYSQL server from your web application. Write a PHP script to create and drop database.	03
21	V	Create database using phpMyAdmin. Write a program to read input data, from table and display all these information in tabular form on output screen.	04
22	V	Write a program to manipulate data from table and display all this information using table format.	03
23	V	Develop small PHP application(s) using forms and database	08
		Total Hours	**67**

8. 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. Prepare a sample static website using HTML tags.
 iii. Demonstrate various readymade CSS templates in group.
  iv. Develop sample we based Application using PHP and MYSQL and present the same.

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Concepts will be introduced in classroom input sessions and by giving demonstration through projector.

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.	Introducing Html5 2/E	Pb By Bruce Lawson;Remy Sharp	Pearson Education
2.	Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP, 4th Edition 2010	Ivan Bayross	Paper Back ISBN : 9788183330084
3.	PHP: The Complete Reference	Steven Holzner	McGraw-Hill Osborne ISBN-13: 978-0071508544
4.	Head First PHP & MySQL	Lynn Beighley, Michael Morrison	o'reilly Media
5.	Teach yourself PHP, Mysql and Apache All in One	Julie C. Meloni,	Pearson Education

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

C) List of Software/Learning Websites
   Software: WAMP server / XAMPP server, 'C' Panel, Filezilla, Text Editor
   i.http://www.codecademy.com/tracks/web , http://www.codecademy.com/tracks/php
   ii.http://www.html.net , http://www.w3schools.com/PHP
   iii.http://www.cssbasics.com
   iv.http://www.tutorialpoint.com
    v.http://www.homeandlearn.co.uk

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,** H. O. D., Computer Department, GP, Ahmedabad.
   - **Prof. J. J. Karagthala** Lecturer Computer Engineering Department, GGP
   - **Prof. R. K. Vaghela** Lecturer Computer Engineering Department,RCTI

   Coordinator and Faculty Members from NITTTR Bhopal

   - **Dr. R. K. Kapoor**, Associate Professor, Dept. of Computer Engineering and Applications.
   - **Dr. M. A. Rizvi,** Associate Professor, Dept. of Computer Engineering and Applications.

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: JAVA PROGRAMMING
(COURSE CODE: 3350703)

Diploma Programme in which this course is offered	Semester in which offered
Computer Engineering/ Information Technology	5th Semester

1. RATIONALE:

Open source platforms play significant role in the corporate world and are gaining popularity because these are freeware and ease of access. Java is a simple, portable, distributive, robust, secure, dynamic, architecture neutral, object oriented programming language. This technology allows the software designed and developed once for an idealized 'virtual machine' and run on various computing platforms. Companies of all sizes are using Java as the main programming platform to develop various applications/projects worldwide. The aim of this course is that student should learn platform independent object oriented programming and java as base language for advanced technology like three tier architecture applications, cloud computing and web development. Many commercial applications as well as developing mission critical applications are using Java Technologies. This necessitates the corporate sectors to hire highly skilled Java developers. So, after learning this course, student can float themselves as Java developer in the software industry as well this course works as foundation course for advance Java programming for the forthcoming semester.

2. LIST OF COMPETENCY:

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

- **Develop software applications using object oriented concept in an Java SDK environment**

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. Explain object oriented programming concepts of java.
  ii. Comprehend building blocks of OOPs language, inheritance, package and interfaces.
  iii. Identify exception handling methods.
  iv. Develop multithreading object oriented programs.
  v. Develop an object oriented program handling data file.

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

5. COURSE CONTENT DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Introduction to Java	1a. Describe Internet role, advantages and, environment setup of Java.	1.1 Basics of Java, Background/History of Java, Java and the Internet, Advantages of Java 1.2 Java Virtual Machine & Byte Code 1.3 Java Environment Setup 1.4 Java Program Structure
	1b.Differentiate between POP and OOP	1.5 Procedure-Oriented vs. Object-Oriented Programming concept
	1c. List important OOP fundamentals	1.6 Basics of OOP: Abstraction, Inheritance, Encapsulation, Classes, subclasses and super classes, Polymorphism and Overloading, message communication
	1d. Write simple programs using java	1.7 Compiling and running a simple "Hello World" program: Setting Up Your Computer, Writing a Program, Compiling, Interpreting and Running the program, Common Errors
Unit – II Building Blocks of the Language	2a. Explain Data types: constant and variables	2.1 Primitive Data Types : Integers, Floating Point type, Characters, Booleans etc 2.2 User Defined Data Type 2.3 Identifiers & Literals 2.4 Declarations of constants & variables 2.5 Type Conversion and Casting 2.6 Scope of variables & default values of variables declared 2.7 Wrapper classes 2.8 Comment Syntax 2.9 Garbage Collection
	2b. State the steps to implement programs for Arrays and String Handling	2.10 Arrays of Primitive Data Types 2.11 Types of Arrays 2.12 Creation, concatenation and conversion of a string, changing case of string, character extraction, String

		Comparison, String Buffer
	2c. List different types of operators	2.13 Different Operators: Arithmetic, Bitwise, Rational, Logical, Assignment, Conditional, Ternary, Increment and Decrement, Mathematical Functions
	2d. State the steps to implement small programs using Decision & Control Structures	2.14 Decision & Control Statements: Selection Statement (if, if...else, switch), Loops (while, do-while, for), Jump statements (break, continue, return & exit)
Unit – III Object Oriented Programming Concepts	3a.Define Objects and Classes and methods	3.1 Defining classes, fields and methods, creating objects, accessing rules, this keyword, static keyword, method overloading, final keyword,
	3b.Explain Constructors & its types, Object as a parameter, constructor overloading	3.2 Constructors: Default constructors, Parameterized constructors, Copy constructors, Passing object as a parameter, constructor overloading
Unit– IV Inheritance, Packages & Interfaces	4a. Describe Inheritance and method overriding 4b. List the types of Inheritance	4.1 Basics of Inheritance, Types of inheritance: single, multiple, multilevel, hierarchical and hybrid inheritance, concepts of method overriding, extending class, super class, subclass, dynamic method dispatch & Object class
	4c. Describe Creating package, importing package, access rules for packages, class hiding rules in a package 4d. Define interface. 4e. Explain inheritance on interfaces, implementing interface, multiple inheritance using interface	4.2 Creating package, importing package, access rules for packages, class hiding rules in a package. 4.3 Defining interface, inheritance on interfaces, implementing interface, multiple inheritance using interface
	4f.Describe Abstract & final classes	4.4 Abstract class and final class
Unit – V Exception Handling & Multithreaded	5a. Explain errors, & exceptions 5b. List types of errors	5.1 Types of errors, exceptions, try..catch statement, multiple catch blocks, throw and throws keywords, finally clause, uses of exceptions, user defined exceptions

Programming	5c. Define thread, creating threads, multithreading, thread priority & synchronization	5.2 Creating thread, extending Thread class, implementing Runnable interface, life cycle of a thread, Thread priority & thread synchronization, exception handing in threads
Unit – VI **File Handling**	6a. Explain basics of streams, stream classes, creation, reading and writing files in context to file handling	6.1 Stream classes, class hierarchy, useful I/O classes, creation of text file, reading and writing text files

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
1.	Introduction to Java	04	4	3	0	7
2.	Building blocks of the Language	08	4	4	6	14
3.	Object Oriented Programming Concepts	06	4	4	6	14
4.	Inheritance, Packages and Interfaces	10	4	4	6	14
5.	Exception Handling, Multithreaded Programming	10	4	4	6	14
6.	File Handling	04	0	3	4	07
	Total	**42**	**20**	**22**	**28**	**70**

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

Note: This specification table shall be treated as 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 are designed to develop different types of skills of the competency. Following is the list of practical problems.

Sr. No	Unit No.	Exercise/Practical (Outcomes in Psychomotor Domain)	Approximate Hrs.
1	1	Install JDK, write a simple "Hello World" or similar java program, compilation, debugging, executing using java compiler and interpreter.	2
2	2	Write a program in Java to generate first n prime numbers.	2
3	2	Write a program in Java to find maximum of three numbers using conditional operator	1
4	2	Write a program in Java to find second maximum of n numbers without using arrays	2
5	2	Write a program in Java to reverse the digits of a number using while loop	1
6	2	Write a program in Java to convert number into words & print it	2
7	2	Write programs in Java to use Wrapper class of each primitive data types	4
8	2	Write a program in Java to multiply two matrix	2
9	3	Write a static block which will be executed before main( ) method in a class.	1
10	3	Write a program in Java to demonstrate use of **this** keyword. Check whether **this** can access the private members of the class or not.	1
11	3	Write a program in Java to develop overloaded constructor. Also develop the copy constructor to create a new object with the state of the existing object.	2
12	3	Write a program in Java to demonstrate the use of private constructor and also write a method which will count the number of instances created using default constructor only.	2
13	3	Write a program in Java to demonstrate the use of **'final'** keyword in the field declaration. How it is accessed using the objects.	1
14	3	Develop minimum 4 program based on variation in methods i.e. passing by value, passing by reference, returning values and returning objects from methods.	2
15	4	Write a program in Java to demonstrate single inheritance, multilevel inheritance and hierarchical inheritance.	3
16	4	Create a class to find out whether the given year is leap year or not. (Use inheritance for this program)	2
17	4	Write an application that illustrates how to access a hidden variable. Class **A** declares a static variable **x**. The class **B** extends **A** and declares an instance variable **x**. **display( )** method in **B** displays both of these variables.	2
18	4	Write a program in Java in which a subclass constructor invokes the constructor of the super class and instantiate the values.	2
19	4	Write a program that illustrates interface inheritance. Interface **P12** inherits from both **P1** and **P2**. Each interface declares one constant and	4

		one method. The class **Q** implements **P12**. Instantiate **Q** and invoke each of its methods. Each method displays one of the constants.	
20	4	Write an application that illustrates method overriding in the same package and different packages. Also demonstrate accessibility rules in inside and outside packages.	4
21	4	Describe **abstract** class called **Shape** which has three subclasses say **Triangle**, **Rectangle**, **Circle**. Define one method **area()**in the abstract class and override this **area()** in these three subclasses to calculate for specific object i.e. area() of Triangle subclass should calculate area of triangle etc. Same for **Rectangle** and **Circle**	2
22	4	Write a program in Java to demonstrate implementation of multiple inheritance using interfaces.	2
23	4	Write a program in Java to demonstrate use of final class.	1
24	5	Write a program in Java to develop user defined exception for 'Divide by Zero' error.	2
25	5	Write a program in Java to demonstrate multiple try block and multiple catch exception	1
26	5	Write an small application in Java to develop Banking Application in which user deposits the amount Rs 1000.00 and then start withdrawing of Rs 400.00, Rs 300.00 and it throws exception "Not Sufficient Fund" when user withdraws Rs. 500 thereafter.	2
27	5	Write a program that executes two threads. One thread displays "Thread1" every 2,000 milliseconds, and the other displays "Thread2" every 4,000 milliseconds. Create the threads by extending the **Thread** class	2
28	5	Write a program that executes two threads. One thread will print the even numbers and the another thread will print odd numbers from 1 to 50.	2
29	5	Write a program in Java to demonstrate use of synchronization of threads when multiple threads are trying to update common variable.	2
30	6	Write a program in Java to create, write, modify, read operations on a Text file.	2
Total			60

8.   SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:
   i.   Study available small Java application on internet and reuse in your application
   ii.   Develop Java object oriented application programs
   iii. Present the application developed

9.   SUGGESTED LEARNING RESOURCES
(A) List of Books:

Sr.No	Authors	Title of Books	Publication
1	Herbert Schildt	Java: The Complete Reference, Seventh Edition	Tata McGraw Hill
2	E Balagurusamy	Programming with Java	Tata McGraw Hill
3	Cay S. Horstmann, Gray Cornell	Core Java, Vol I- Fundamentals	Java Series, Sun MicroSystem

Sr.No	Authors	Title of Books	Publication
4	Sachin Malhotra & Saurabh Choudhary	Programming in JAVA, Second Edition	Oxford

(B) List of Major Equipment/Materials

    i.   Computer System with latest configuration and memory
    ii.   Multimedia projector
    iii. Internet Access
    iv. Access to library resources

(C) List of Software/Learning Websites

    i.   Java Development Kit:
        http://www.oracle.com/technetwork/java/javase/downloads/index.html
    ii.   http://docs.oracle.com/javase/specs/jls/se7/html/index.html
    iii. http://docs.oracle.com/javase/tutorial/java/index.html
    iv. http://www.tutorialspoint.com/java/
    v.   http://www.learnjavaonline.org/
    vi. http://www.c4learn.com/javaprogramming/
    vii. http://www.learn-java-tutorial.com/
    viii. http://www.tutorialspoint.com/javaexamples/

10. SPECIAL INSTRUCTIONAL STRETEGIES (If Any)

The course activities include Lectures and Practical Exercises as per teaching scheme.

    i.   Conceptual knowledge will be shared interactively using multimedia projector.
    ii.   Student should be given environment to develop sample applications using JAVA under guidance of Teachers.

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE
Faculty members from Polytechnics

- **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. M. P. Mehta**, Sr. Lecturer in Computer Technology, K. D. Polytechnic, Patan
- **Prof. H. P. Chauhan**, Lecturer(IT), Government Polytechnic, Himmatnagar
- **Prof A. S. Galathiya**, Lecturer in Computer Department, R. C. Technical Institute, Ahmedabad
- **Prof. H.J. Prajapati,** Lecturer(IT), Government Polytechnic, Himmatnagar
- **Prof. J. S. Upadhyay,** Lecturer and Head, IT, K P T I T, Viramgam

Coordinator and Faculty Members from NITTTR Bhopal

- **Dr. Shailendra Singh,** Professor & Head, Dept. of Computer Engineering and Applications.
- **Dr. James K. Mathai**, Associate Professor, Dept. of Computer Engineering and Applications.

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM
COURSE TITLE: COMPUTER AND NETWORK SECURITY
(COURSE CODE: 3350704)

Diploma Programmes in which this course is offered	Semester in which offered
Computer Engineering	5th Semester

1. RATIONALE

Present computing era is based on internet and hence networking is an essential part of course. Prime concern is that in current advanced digital world various security threats are increasing day by day posing problems to data confidentiality, integrity and availability. This course aims at learning basic cryptography techniques and applying security mechanisms for operating systems as well as private and public network to protect them from various threats.

2. LIST OF 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:

- **Determine appropriate mechanisms for protecting networked systems by applying various cryptographic techniques.**
- **Secure the network by using firewalls on various networks in order to identify various network attacks and resolve them**.

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. Identify and describe the common types of security threats are risks to the Computer Systems and the nature of common Information hazards.
  ii. Identify the potential threats to confidentiality, integrity and availability of Computer Systems.
  iii. Describe the working of standard security mechanisms and applied to the external and internal network.
  iv. Define cryptography, describe the elements of the encryption process and select best algorithm to encrypt data and protocols to achieve Computer Security.
  v. Apply accepted security policies, procedures are necessary to secure Operating Systems and applications.

4. Teaching and Examination Scheme

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

5.   COURSE CONTENT DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I **Introduction and Security Threats:**	1a.List and discuss various security terms, recent trends in computer security. 1b. Describe various types of threats that exist for computers and networks.	1.1 Threats to security : Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare
	1c. Describe simple steps to take minimize the possibility if an attack on a system.	1.2 Avenues of Attack, steps in attack
	1d. Define Security Basics.	1.3 Security Basics – Confidentiality, Integrity, Availability
	1e. Describe various types of computer and network attacks 1f. Identify various types of malicious software that exists.	1.4 Types of attack: Denial of service (DOS), backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hacking, Phishing attacks, Distributed DOS, SQL Injection. Malware : Viruses, Logic bombs
Unit – II **Organizational Security**	2a.List & Define various human security threats. 2b. Determine ways in which users can aid security.	2.1 Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software /hardware, Access by non employees. 2.2 People as Security Tool: Security awareness, and Individual user responsibilities.
	2c. Describe physical security components that can protect any computer and network.	2.3 Physical security: Access controls Biometrics: finger prints, hand prints, Retina, Patterns, voice patterns, signature and writing patterns, keystrokes, Physical barriers
	2d.List potential threats on password and explain characteristics of a strong password.	2.4 Password Management, vulnerability of password, password protection, password selection strategies, components of a good password.

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – III Cryptography and Public key Infrastructure	3a. Identify and describe types of cryptography . 3b. List and describe various Encryption Algorithms.	3.1 Introduction to Symmetric encryption & Asymmetric encryption. 3.2 Encryption algorithm / Cifer, Encryption and Decryption using: Caesar's cipher, playfair cipher, shift cipher, shift cipher, Vigenere cipher, one time pad (vermin cipher), hill cipher (for practice use small matrix and apply encryption only).
	3c. Describe transposition techniques and steganography.	3.3 Transposition techniques (rail fence), steganography
	3d. Explain Hashing and SHA-1 mechanism.	3.4 Hashing function : SHA1 (only)
	3e. Distinguish Asymmetric and Symmetric Encryption. 3f. Describe digital signature and concept of key escrow.	3.5 Asymmetric encryption: Digital Signatures, Key escrow
	3g. List the basics of public key infrastructures. 3h. Describe the roles of certificate authorities and certificate repositories. 3i. Describe the role of registration authorities. 3j. Explain the relationship between trust and certificate verification. 3k. Explain use of digital certificates.	3.6 Public key infrastructures : basics, digital signatures, digital certificates, certificate authorities, registration authorities, steps for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate
	3l. Distinguish centralized and decentralized infrastructures.	3.7 Centralized or decentralized infrastructure, private key protection
	3g. List and describe trust models.	3.8 Trust Models: Hierarchical, peer to peer, hybrid
Unit IV Network security	4a. Explain working principle of FIREWALLs.	4.1 Firewalls: working, design principles, trusted systems, Kerberos.
	4b.Define, classify and	4.2 Security topologies – security zones,

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	describe various security topologies.	DMZ, Internet, Intranet, VLAN, security implication, tunneling.
	4c. Describe Internet Protocol Security (IPsec) and its use in securing communication.	4.3 IP security : overview, architecture, IPSec configurations, IPSec security
	4d. Explain email security.	4.4 Email security : security of email transmission, malicious code, spam, mail encryption
Unit V Web Security	5a. Define & list various types of IDSs. 5b. Distinguish Host-based IDS & Network-based IDS. 5c. List and describe HIDS and NIDS components. 5d. List advantages and disadvantages HIDS, NIDS	5.1 Intruders, Intrusion detection systems (IDS): host based IDS, network based IDS, logical components of IDS, signature based IDS, anomaly based IDS, network IDS components, advantages and disadvantages of NIDS, host based IDS components, advantages and disadvantages of HIDS.
	5e. List & Explain Web Security Threats. 5f. Explain securities in SSL and TLS. 5g. Explain concept of secure electronic transaction.	5.2 Web security threats, web traffic security approaches, Introduction to Secure Socket Layer (SSL) & Transport Layer Security(TLS), Concepts of secure electronic transaction

6.   SUGGESTED SPECIFICATIONTABLE WITH HOURS&MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction and Security Threats	6	4	4	4	12
II	Basics of System Security	6	4	4	4	12
III	Cryptography and Public key Infrastructure	14	6	8	8	22
IV	Network security	8	2	8	2	12
V	Web Security	8	2	8	2	12
	Total	**42**	**18**	**32**	**20**	**70**

Legends: R = Remember; U= Understand; A= Apply and above levels (Bloom's Revised 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/PRACTICALS

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Approx Hrs. required
1	I	List and practice various "net" Commands on DOS & Linux.	04
2	I	Configure a system for various security experiments.	02
3	I	Configure Web browser security settings.	02
4	I	Draw Diagram of DoS, backdoors, trapdoors.	04
5	I & II	Draw diagrams of sniffing, spoofing, man in the middle & replay attacks.	02
6	I	Draw diagram for Confidentiality, Integrity & Availability.	02
7	III	Write Ceaser's Cipher algorithm & Solve various examples based on Encryption & Decryption.	02
8	III	Write, test and debug Ceaser cipher algorithm in C/C++/Java/Python/Matlab.	02
9	III	Write algorithm/steps for Shift Cipher & solve various examples on it.	02
10	III	Write algorithm/steps for Hill Cipher and solve examples on it.	02
11	III	Write algorithm/steps for playfair cipher and solve examples on it.	02
12	III	Write algorithm/steps for Verman Cipher & solve	02

		various examples on it.	
13	III	Write algorithm/steps for Vignere Cipher & solve various examples on it.	02
14	III	Write algorithm/steps for one time pad & solve various examples on in.	02
11	III	Draw diagram of Public Key Infrastructure.	02
12	III	Draw diagram of Centralized/Decentralized Infrastructure.	02
13	III	Demonstrate cross-scripting.	02
14	IV	Draw various Security Topologies.	02
15	IV	Demonstrate traffic analysis of different network protocols using tool. i.e. Wire-shark. (Atleast one of them should be recorded and included in term work.)	04
16	IV	Demonstrate Sniffing using packet tool i.e. snort.	04
17	IV	Configure your e-mail account against various threats. i.e. spam attack, phising, spoofing etc.	04
18	V	Draw diagram Host-based Intrusion Detection System	02
19	V	Draw diagram Network-based Intrusion Detection System	02
20	V	Demonstration of SQL-Injection.	02
21	V	Demonstration of readymade encryption/decryption code	04
Total			**62**

8.   SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like**:**

    i.   Visit to Internet Service Provider
    ii.   Study measures are taken by small computer industries
    iii.   Seminars on various security tools, algorithms from the course content
    iv.   Seminars on current threats on system/network

9.   SPECIAL INSTRUCTIONAL STRATEGIES (if any)

The course activities include Lectures and Practical Exercises as per teaching scheme. The programmes in would be executed during practical's sessions. Following needs attention:

    i.   Concepts will be introduced in lectures using multimedia projector.
    ii.   Discussion
    iii.   Demonstrations
    iv.   Power point presentation for each of the software tools/algorithms
    v.   Practical work will be through laboratory sessions.
    vi.   Debate/Group Discussions for comparison of various tools and algorithms

10.   SUGGESTED LEARNING RESOURCES

A)   List of Books

Sr.No.	Title of Book	Author	Publication
1.	Principles Of Computer Security CompTIA Security+ And Beyond (Exam SY0-301), 3rd Edition Books	Conklin, Wm. Arthur Gregory White, Dwayne Williams, Roger Davis, Chuck Cothren, Corey Schou	Mc Graw Hill ISBN:9781259061196, 2012
2.	Cryptography and Network Security Principles and Practices	Williams Stallings	Pearson Education, Third Edition
3.	Principles of Computer Security CompTIA Security+ and Beyond Lab Manual	Vincent Nestler, Gregory White, Wm. Arthur Conklin, Matthew Hirsch, Corey Schou	Mc Graw Hill, 2010 , 9780071748568
4.	Cryptography and Network Security Principal and Practices	Atul Kahate	Tata-McGraw-Hill Sixth reprint 2006
5.	Cryptography and Network Security	B A Forouzen	TMH
6.	Computer Security Basics	Deborah Russell G.T. Gangenisr	O'Reilly publication
7.	Computer Security	Dieter Gollman	Wiley India Education, Second Edition

B)   List of Major Equipment/ Instrument with Broad Specifications

i.   Computer System with latest configuration and memory, laptops, servers
ii.   Multimedia projector
iii.   High B/W Internet Connection.
iv.   Open source Free diagnostic software/tools
v.   Access to library resources

C)   List of Software/Learning Websites

i. Software: Wireshark Traffic Analysis/Packet Sniffing Tool, Snort Packet Sniffing tool
ii. www.securityplusolc.com.
iii. http://mercury.webster.edu/aleshunas/COSC%205130/COSC%205130%20Home.htm
iv. http://williamstallings.com/Cryptography/
v. http://mercury.webster.edu/aleshunas/COSC%205130/Chapter-22.pdf
vi. http://nptel.iitm.ac.in/courses.php?disciplineId=106
vii. Network Simulator Tool: GNS3 v0.8.5, NetSimK
viii. http://www.snort.org/docs
ix. http://manual.snort.org/node27.html
x. http://www.wireshark.org/docs/wsug_html_chunked/

xi. http://www.pearsonhighered.com/assets/hip/us/hip_us_pearsonhighered/samplechapter/013
    1407333.pdf

xii. http://www.cs.nyu.edu/courses/fall04/G22.2262-
    01/assignments/assignment4_files/Ethereal_TCP.pdf

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. K. N. Raval,** H.O.D Computer Department, R. C. Technical Institute, Ahmedabad
- **Prof. Manisha P Mehta**, Sr. Lecturer in Computer Technology, K. D. Polytechnic, Patan.
- **Prof. Sunil R. Solanki**, Lecturer in Computer Engineering, Govt. Polytechnic, Dahod.
- **Prof. Sachin D. Shah,** Lecturer in Computer Engineering, R. C. Technical Institute, Ahmedabad.

Coordinator and Faculty Members from NITTTR Bhopal

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- **Dr. Priyanka Tripathi,** Associate Professor, Dept. of Computer Engineering and Applications, NITTTR

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

COURSE TITLE: MULTIMEDIA AND ANIMATION TECHNIQUES

(COURSE CODE: 3350705)

Diploma Programmes in which this course is offered	Semester in which offered
Computer Engineering	5th Semester

1. **RATIONALE**

Animation is required to create action oriented phenomena in applications that can be hosted on website. Animation plays a huge role in entertainment (providing action and realism) in advertising, films and gaming industry and also be extremely effective in education (providing visualization and demonstrations of abstract ideas and concepts).

Adobe flash is an important and popular tool that is used to design such application suitable for web. In this course student will learn to use adobe flash to develop two dimensional animations. Developing animation requires fair knowledge about the graphics. Thus course also introduces basics of graphics using Photoshop. The students of this course will be able to design multimedia and animated rich content that can be hosted on the web.

2. **LIST OF 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 competency:

- **To develop multimedia and animated rich web content using Photoshop and flash**

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

- Create graphics using design elements
- Differentiate between vector and raster image
- Change attributes of images
- Identify the fundamental animation features and functions
- Produce key drawings for animations

- Create 2D digital animation

- Develop vector graphics and 2D animations, making use of various tools and animation techniques provided by Flash

- Develop animation using action script of flash

- Publish flash movie

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 Theory Practice; **P** - Practical; **C** – Credit **ESE** - End Semester Examination; **PA** - Progressive Assessment.

5.   COURSE CONTENT DETAILS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – I **The Elements of Design and Image Basics**	1a Explain Graphics and color Fundamentals. 1b Explain steps to create documents & optimizing images in Photoshop	1.1 Graphics Basics : Bitmap vs. vector-based graphics, Color/bit depth and image resolution , Graphic file formats iv Optimizing web graphics , Vector graphics vs. bitmap graphics, Regular text vs. anti-aliased text , Standard selection vs. floating , selection, Tolerance xiv Opacity 1.2 Introduction to Color : Color modes- RGB, CMYK, grayscale, LAB, bitmap, Hue, saturation, and brightness, Browser safe colors , Shadows, highlights and midtones of an image Photoshop Interface, Tools and Options 1.3 Interface, Tools and Options: About Photoshop, The Photoshop Interface , Setting up a new Photoshop document , Saving a new document , The Default palettes , Working with Photoshop palettes , The Photoshop Toolbox and Options bar, Using Guides and Ruler 1.4 Photoshop Image and Color Basics :

Unit	Major Learning Outcomes	Topics and Sub-topics
		Supported import and export image formats, Opening an Image in Photoshop , Creating images In Photoshop, Saving images In Photoshop v. Basic image editing, Changing image size, Cropping an image, Changing color/bit depth, Optimizing Images using Save for Web, Working with color in Photoshop
		1.5 Transforms :Using free transform , Move ,Rotate ,Scale, Skew , Distort , Perspective , Flip-vertical, horizontal ,Invert , Rotate 180º, Rotate 90º CW , Rotate 90º CCW
Unit– II Photoshop tools for creating professional grade Images	2a Describe use of different Photoshop tools	2.1 Photoshop Tools: Parts of the Toolbox , Toolbox shortcuts , Tools options, Marquees , Magic wand , Lassos , Move tool , Crop tool, Slice tools, Pencil , Paintbrush ,Eraser tools ,History brushes, Gradient , Paint bucket , Burn-dodge-sponge, Blur-sharpen-smudge, Shapes-line-rectangle-polygon , Path selection tool , Pen tool , Type tools , Notes tool-audio annotation, Eyedropper-color sampler- measure too, Hand-zoom , Quick mask-Screen modes , Jump to Image Ready , Back ground and foreground.
	2b Explain importance of layers	2.2 Layers, Channels and Actions: About layers-fill and adjustment layers , The layer palette, Naming layers, Creating layers , Deleting layers , Viewing layers , Moving layers , Layer opacity . Locking layers , Merging layers, Layer modes and blending options, Image composting using layers
	2c Explain needs of enhancement of images and color corrections in documents and apply in created documents.	2.3 Restoring and enhancing images : Restoring damaged photos , Photo retouching , Clone tamp-pattern stamp, Healing brush tool , Retouch tool , Photo enhancement and Color correction Changing levels , Changing curves, Color balance, Changing brightness and contrast , Changing hue saturation and brightness , Histogram, Gradient map , Desatuarate, Invert ,Color replace, Selective color , Equalize, Threshold, Channel mixer , Posterize, Changing background using layer composting.

Unit	Major Learning Outcomes	Topics and Sub-topics
	2d Describe text editing tools and create documents on it.	2.4 Text editing and special effects : About the type layer, Creating vertical and horizontal types, Point and paragraph text creation, Using horizontal and vertical type mask tools, Using character palette for text editing, Choosing a font, Changing the type color , Choosing a type size, Specifying kerning and tracking, Using fractional character widths , Specifying baseline shift , Applying underline and strikethrough , Text alignment and justification , Specifying anti-aliasing , Creating text warp , Rasterizing type, Converting type to shapes , Adding effects to text
Unit– III Flash Fundamentals	3a Explain basic concepts of vector graphics and flash environment	3.1 Environments and tools: Bitmap Vs vector graphics, Image Vs Movie, Conventional Animation Vs Flash animations, Concepts of Frame Rate and Resolution, PAL, NTSC and Film Standards 3.2 Exploring The Flash Interface: The Flash stage, Stage Settings, Creating a new Flash file, The various import formats, Timeline-Play head/Frames/Key Frames/ Blank frames, Menus, Toolbox and Properties, Keyboard shortcuts and Preferences, Color Swatches and Color Mixer, Rulers, Guides, Grids and Snappings, Common Libraries, Debugger and Output, Movie Explorer
	3b Explain basic tools of flash to create simple documents and discuss detailed steps to develop small flash applications	3.3 Working with images: Discussing bitmap and vector graphics, Importing and manipulating images, Converting bitmaps to vector graphics 3.4 Basic drawing and Selections: Applying the Pencil and Eraser tools, Drawing with the Pen tool, Creating custom line styles, Selection Tools -Arrow Tools, and Lasso Tool, Navigation Tools - Hand and Zoom Tools 3.5 Shapes: Basic shapes, Creating rectangles, ovals, and circles, polystar, Creating freeform shapes, Selecting and editing shapes, Using the Selection and Lasso tools, Transforming

Unit	Major Learning Outcomes	Topics and Sub-topics
		shapes, Copying, moving, and deleting a shape, Grouping and aligning objects
		3.6 Color: Applying color, Using the Paint Bucket and Ink Bottle tools, Using the Eyedropper and Brush tools, Fill Transform Tool, Custom colors and gradients, Creating a custom color swatch, Applying gradients, Creating a custom gradient
		3.7 Text : The Text tool, Creating an extending text block, Creating a fixed text block, Text formatting, Changing font styles, Modifying a text block, Aliasing small text, Adjusting the kerning of text, Setting line spacing/margins//indentation, Converting text into, Text utilities, Using the Find and Replace feature, Using the Spell Checker feature, Using the History panel
Unit– IV **Symbols, Animation And Organizing Projects**	4a Discuss importance of layers and detailed steps to create application using layers	4.1 Layers : Layer basics, Merging and rearranging layers, Deleting a layer, Modifying layers, Renaming a layer, Layers Folders, Locking and hiding layers, Masking a layer, Creating layer folders, Guide layers, Creating a guide layer, Controlling the speed of a motion tween, Arranging and extending frames
	4b Explain frames, time-line and discuss detailed steps to develop applications using it	4.2 Scenes and Frame Labels: Creating a Scenes, Organizing Scenes, Creating Frame Labels 4.3 Symbols and Instances: About Symbols and Instances, Using and managing the Symbol Library, Graphic Symbols, Movie Clip Symbols, Managing the Timeline of Movie Clip with the main Timeline, Button Symbols, Creating and editing a button symbol, Controlling tints, brightness and transparency of instances
	4c Explain animation concepts and write detailed steps to develop animated applications	4.4 Animation: Animation basics, Timeline, Frames and Key Frames, Creating a basic text animation, Creating and manipulating animations, Creating a basic frame-by-frame animation, Using Onion Skin to modify an animation, Using shape tweening and hinting, Using motion tweening, Using motion tweening with a guide, Mask Animations

Unit	Major Learning Outcomes	Topics and Sub-topics
	4d Write detailed steps to include sound and embedding videos	4.5 Working with sound and embedding videos
Unit– V Introduction To ActionScript	5a Discuss importance of ActionScript	5.1 Introduction To ActionScript: Understanding Object Oriented Programming, When to Use ActionScript, Introducing the Actions Panel, Working in Normal Mode, Working in Expert Mode, Using the Reference Panel, Understanding ActionScript Syntax
	5b Discuss steps to create movie using ActionScripts. 5c Write various ActionScript using loops, variables and arrays 5d Write scripts to modify existing objects of movie. 5e Describe steps to publish flash movie.	5.2 Creating ActionScript Movies: About Flash Symbol Types, Adding an Action to Your Script, Adding an Action to a Key frame, Adding an Action to an Object, Adding an Action to a Button, Planning Your ActionScript Movie, Tips for Creating Code, Dissecting an ActionScript
		5.3 Controlling The Timeline With ActionScript: Starting and Stopping the Movie, Navigating to Frames and Scenes, Creating an Interactive Animation, Navigating to URLs, Opening a URL in a Different Browser Window
		5.4 Controlling Movie Content With ActionScript: Creating Presentations, Working with Flash Levels, Using the LoadMovie and UnloadMovie Action
		5.5 Creating ActionScript Loops: About Loops, Looping Between Frames, Creating a For Loop, Creating a While Loop, Creating a Do While Loop
		5.6 Working With Variables And Arrays: About Variables and Arrays, Understanding Variable Data Types, Variable and Array Naming Conventions, Declaring a Variable, Creating an Array, Working with Arrays, Getting Data From an Array
		5.7 Modifying An Object With ActionScript: Creating a Movie Clip, Creating Movie Clip Instances, Using the Set Property Action, Changing an Object's, Getting an Object's

Unit	Major Learning Outcomes	Topics and Sub-topics
		Properties
		5.8 Using ActionScript with Text: Creating Input Text Blocks, Creating Dynamic Text Blocks, Loading Text From an External Document, Creating Rich Formatted Text
		5.9 Publishing A flash movie; changing publish settings

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	**The Elements of Design and Image Basics**	06	04	02	04	10
II	**Photoshop tools for creating professional grade Images**	10	04	04	06	14
III	**Flash Fundamentals**	08	04	04	06	14
IV	**Symbols, Animation And Organizing Projects**	08	04	04	06	14
V	**Introduction To ActionScript**	10	06	06	06	18
		42	**22**	**20**	**28**	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's Revised 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/PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills (**Outcomes in cognitive, psychomotor and affective domain**) so that students are able to acquire the competencies.

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 **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that*

common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. required
1	I	Create graphics – lines, shapes, texture, filling colors using color palates, texturing	04
2	I	Develop a banner of recent activity in your college or any festival.	04
3	II	Develop a collage of different images of different sizes and properties.	02
4	II	Write test and debug a Photoshop document illustrating the working of different Photoshop drawing and image tools.	04
5	II	Modify images – setting resolution of images, sizes, pixel depth, color modes – RGB, CMYK, Gray Scale and comparison of images based on storage size & image quality, save file in different file formats - .bmp, jpeg, jpg, tga, tiff, gif, pic, pdf, png etc.	04
6	II	Create documents based on layers	02
7	II	Develop a webpage using complete Photoshop kit.	04
8	III	Write, test and debug small applications using Basic Flash concepts using shapes, colors, text and images.	08
9	IV	Write, test and debug small applications with flash layers.	04
10	IV	Write, test and debug small applications with Scenes and Frame Labels	04
11	IV	Write, test and debug small applications with flash symbols and instances.	04
12	IV	Write, test and debug small applications with flash animation.	04
13	V	Write, test and debug small applications with simple action script.	04
14	V	Write, test and debug small applications of movie using action script.	04
15	V	Write, test and debug small applications of movie using timeline action script.	04
16	V	Write, test and debug small applications with flash & publish it using flash	04
Total (practical for 56 hours from above representing each unit may be selected)			**64**

8.   SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

i.   Survey of various animated websites and latest tools available to create animated website
ii.   Seminar on various readymade examples of Photoshop/flash
iii. Make small animation using flash and Photoshop in the group
iv.   Demonstration of individual assigned project

9.   SPECIAL INSTRUCTIONAL STRATEGIES (if any)

The course activities include Lectures and Practical Exercises as per teaching scheme. The programmes in would be executed during practical's sessions. Following needs attention:

i.   Concepts will be introduced in lectures using multimedia projector and content related videos
ii.   Discussion
iii. Demonstrations
iv.   Power point presentation for each of the topics
v.   Practical work will be through laboratory sessions.
vi.   Debate/Group Discussions for comparison of developed projects by the students

10.   SUGGESTED LEARNING RESOURCES

A)   **List of Books**

Sr No.	Title of Book	Author	Publication
1.	Photoshop CC: The missing manual	Lesa Snider	O'Reilly Media
2.	Adobe Photoshop CS5 -one-to-one	Deke MCClelland	O'Reilly Media
3.	Adobe flash CS4 Professional Bible	Robert Reinhardt, snow dowd	Wiley
4.	Flash CS6/CS5/CS4 in Simple Steps	Kogent Learning Solution Inc.	Wiley
5.	Macromedia Flash MX 2004: The Complete Reference	Brian Underdahl	MGH
6.	Action Script for Flash MX: The Definitive Guide 2nd Edition	Colin Moock	O'Reilly Media
7.	Macromedia Flash MX Bible	Robert Reinhardt and Snow Dowd	Wiley
8.	Macromedia Flash MX: A Beginner's Guide	Brian Underdahl	MGH

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

    i.   Computer System with latest configuration and memory, laptops, servers
    ii.   Open source Free software for animations /editors for html5/css3
    iii.   Multimedia projector
    iv.   Internet Access
    v.   Access to library resources

C) **List of Software/Learning Websites**

    i.   Software: Microsoft windows operating system from xp/vista7/8 to latest version available in market, Adobe flash 4.0 or higher version, Adobe Photoshop CS5 or higher version, flash compatible browsers
    ii.   http://www.codecademy.com/learn
    iii.   www.photoshopessentials.com
    iv.   www.adobeknowhow.com
    v.   http://www.webdevelopersnotes.com/tutorials/flash/
    vi.   http://www.adobe.com/devnet/flash.html
    vii.   http://www.adobe.com/support/flash/tutorial_index.html
    viii.   http://www.thefreecountry.com/webmaster/flash.shtml

11.   COURSE CURRICULUM DEVELOPMENT COMMITTEE

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