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 compositing 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

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, Ahmdeabad

- **Prof. M. P. Mehta,** Sr. Lecturer in Computer Technology, K. D. Polytechnic, Patan

- **Prof. R. M. Shah,** Sr. Lecturer in Computer Technology,Government Polytechnic, Ahmedabad

- **Prof. J. J. Karagthala** Lecturer Computer Engineering Department, GGP

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