GUJARAT TECHNOLOGICAL UNIVERSITY

INFORMATION TECHNOLOGY
SUBJECT NAME: MULTIMEDIA AND ANIMATION
SUBJECT CODE: 2181607
B.E. 8th SEMESTER

Type of course: NA

Prerequisite: Nil

Rationale:

1. To understand multimedia communication systems and applications
2. To understand Image, Text and Video compression methods
3. To familiarize the students with various approaches, methods and techniques of Animation Technology.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	**Multimedia Communications:** Introduction, Multimedia information representation, Multimedia networks, Multimedia applications, Application and networking terminology, Multimedia information representation: Digitization, Principles, Text and Images, Audio and video, Digital Video/Audio/Image coding standards	**08**	15
2	**Image Compression Systems**: Fundamentals of Image, Redundancy In Image, Lossless And Lossy Image Compression Techniques, Measurements Quality of Reconstructed Image (MSE, SNR, PSNR) , Huffman Coding, GIF,TIFF,JPEG	**08**	15
3	**Text Compression** : Compression Principles, Entropy And Source Encoding, Static Huffman Coding, Dynamic Huffman Coding, Arithmetic Coding, LZW Coding	**08**	15
4	**Audio-Video Compression**: Audio Compression, PCM, DPCM, ADPCM, Adaptive Predictive Coding, Linear Predictive Coding, Code-Excited Coding, Perceptual Coding, Mpeg Audio Coder, Digital Video Coding Fundamentals, Video Compression Principles, Video Compression Standards	**08**	20

5	**3D Animation**: Introduction, Modeling : Polygon and Splines, Animation techniques : Key Frame Animation, Forward Kinematics, Inverse Kinematics, Shape Deformation, Rendered Animation, Morphing, Character Animation, Facial Animation	**10**	30
6	**3D Modeling and Animation tool** : Blender	**03**	05

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	**50**	**30**	**-**	**-**	**-**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create 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.

Reference Books:

1. Multimedia Communications- Applications, Networks, Protocols & Standards By Fred Halsall., Pearson Publications
2. Introduction to Multimedia Communications By K.R. Rao, Zoran S.B. & Dragorad A.M. – Wiley Publications
3. Principles of Three dimensional computer animation by Michael O'Rourke, W W Norton & Company
4. Data Compression :The Complete Reference by David Salomon - Springer International Edition
5. Facial modeling and animation: stop staring by Jason osipa, Wiley India Pvt. Ltd.

Course Outcome:

After learning the course the students should be able to:

1. Understand multimedia communication systems
2. Develop compression algorithms for Text, Image and Video
3. Understand different animation techniques
4. Use modeling and animation tools

List of Experiments:

1. Text compression
2. Image compression
3. Audio compression
4. Video compression
5. Key frame based animation
6. Morphing
7. Rendered animation
8. Character animation

9. Facial animation
10. Modeling and animation using Blender

Design based Problems (DP)/Open Ended Problem:

Develop small animation using Blender

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.