

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Diploma Engineering			Branch		INFORMATION TECHNOLOGY		
Semester		V			Version		1.0.0.0		
Effective from Academic Year			2020-21		Effective for the batch Admitted in			July 2018	
Subject code		1IT2503	Subject Name		Computer Graphics & Multimedia				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:
Python, Linear algebra, Matrices

Course Learning Outcomes:
The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes: T1. To understand the basics of various inputs and output computer graphics hardware devices as well as the course will offers an in-depth exploration of fundamental concepts in 2D graphics. T2. To apply, implement and develop programs of transformations on various images. T3. To understand audio and video concepts. The 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 course learning outcomes.

Course Content				
Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
UNIT – 1 Basic of Computer Graphics	1.1 History of Computer Graphics 1.2 Applications of computer graphics 1.3 Graphics devices	1a.Evolution 1b.Uses of Computer Graphics 1c.Input and Output devices and Graphics S/W	5	03
UNIT – 2 Graphics Primitives	2.1 Line drawing Algorithm 2.1.1 Simple Line Drawing Algorithm 2.1.2 DDA algorithm 2.1.3 Bresenham’s Line Algorithm 2.2 Parallel Line Algorithm 2.3 Circle Drawing Algorithm 2.3.1 Mid-point circle algorithm 2.4 Filled Area Primitives 2.4.1 Boundary Fill algorithm 2.4.2 Flood fill Algorithm	2a.To understand line concepts 2b.Draw lines using different algorithms 2c.To draw circles using algorithms 2d.Area filling	13	08
UNIT – 3 2D Geometry	3.1 Basic Transformations 3.1.1 Translation 3.1.2 Rotation 3.1.3 Scaling	3a. Transformations 3b. Transformations on 2D picture 3c. Composition of rotation, scaling and translation	12	11

	3.2 Composite Transformations 3.2.1 Translation 3.2.2 Rotations 3.2.3 Scaling 3.3 Other Transformation 3.3.1 Reflection 3.3.2 Zooming			
UNIT – 4 2D Viewing	4.1 Viewing Pipeline 4.2 Windows to Viewpoint coordinate transformation 4.3 Clipping Operations 4.3.1 Point Clipping 4.3.2 Line Clipping 4.3.3 Cohen Sutherland Line Clipping 4.3.4 Polygon Clipping 4.3.5 Sutherland Hodgeman Polygon Clipping 4.4 Translation 4.5 Rotation 4.5.1 General Three Dimensional Rotations	4a.Pipelining 4b.Coordinate transformations 4c.Clipping on point, line and polygon 4d.Translation on 2D image 4e.Rotation on 2D image	15	11
UNIT – 5 Multimedia and Animation	5.1 Introduction to multimedia 5.1.1 Multimedia, Hypertext, Hypermedia 5.1.2 Application of Multimedia in various fields 5.1.2.1 Education, Media, Home, Marketing 5.2 Storage medium, Representation medium, Transmission medium, Independent media 5.3 Basics concepts of audio & video 5.4 Formats of audio & video	5a.Basics of Multimedia 5b.Representation of different media for picture 5c.Audio and Video concepts 5d.Different formats of sound and videos	15	12

List of Practical		
No.	Unit	Name of Practical
1	Unit1	Study about Computer Graphics concepts
2	Unit2	To Study about matplotlib numpy tkinter python library
3	Unit2	To Draw point and dots using scatter()
4	Unit2	To Draw line using scatter() with help of different algorithm
5	Unit2	To Draw line using plt.plot(), plt.text(), plt.arrow()
6	Unit2	To Draw Circle with plt using different algorithm
7	Unit3	To study about PIL library (python imaging library)
8	Unit3	To Open an Image and discover its attributes
9	Unit3	Program for different image format conversion.(JPEG,PNG,TIFF,GIF,BMP)
10	Unit3	To study & make a program about rotation in 2D Picture
11	Unit3	Program to Flip image vertically and horizontally
12	Unit3	Program to blend two images
13	Unit4	To study & make a program about Translation in 2D Picture
14	Unit4	To study & make a program about Scaling in 2D Picture

15	Unit5	Program to open different audio files and study about library function
16	Unit5	Study about different video format and moviepy() library
17	Unit5	Study about animation
18	Unit5	Program to static shift a ball

List of Instruments / Equipment / Trainer Board	
1	Python Compiler
2	Computer systems with high RAM

List of Textbooks			
No	Title of TextBooks	Authors	Publication
1	Computer Graphics	Donald Hearn, M. Pauline Baker	Pearson

List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Python 2.6 Graphics CookBook	Mike Ohlson de Fine	PACKT
2	Pyhon Graphics	B.J.Korites	Apress
3	Multimedia	Parekh	TMH
4	Multimedia Computing and Applications	Ralf Steinmetz	Pearson
5	Multimedia and Computer Graphics	D.P.Mukharjee	-

Link of Learning Web Resource	
1	http://anh.cs.luc.edu/handsontutorial/python/tutorial/graphics.html
2	https://www.javatpoint.com/computer-graphics-bresenhams-circle-algorithm
3	https://wiki.python.org/moin/Audio/
4	https://pypi.org/project/moviepy/