

Maharashtra State Board of Technical Education, Mumbai
LABORATORY PLAN (LP)/COURSE INFORMATION SHEET (CIS)

K-2

Academic Year: 2026-27

Date: 01/07/2024

Institute Name & Code: K. K. Wagh Polytechnic, Nashik-3

Institute Code: 0078

Program and Code: Computer Technology (CM)

Course Index: CI305

Course Name: Computer Graphics (CGR)

Course Code & Abbr :- 313001 (CGR)

Class: SYCM-Lin

Semester: IIIrd

Scheme: K

Total Hrs: 30 Hrs.

Name of Faculty: Miss. S. R. Nikam

• Teaching and Examination Scheme:

Course Title	Course Code/ Abbr	Course Category	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
			Actual Contact Hrs/Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		
			CL	TL	LL					FA TH	SA TH	Total		FA-PR		SA-PR		SLA		
												Max	Max	Max	Min	Max	Min	Max	Min	
Computer Graphics	313001 CGR	DSC	1	-	2	1	4	2	-	-	-	-	-	25	10	-	-	25	10	50

Abbreviations: CL- Class Room Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

• Course Outcomes (COs): Theory & Practical

By learning course Computer Graphics (CGR), Second Year students will be able to:

CO No.	Course Outcomes (COs) / Unit Outcomes (UOs)
CO305.1 (CO1)	Manipulate Visual and Geometric information of Images.
CO305.2 (CO2)	Develop programs in C applying standard graphics algorithms.
CO305.3 (CO3)	Perform and Demonstrate basic and composite graphical transformations on given object.
CO305.4 (CO4)	Implement various Clipping algorithms.
CO305.5 (CO5)	Develop programs to create Curves.

• Practical -Laboratory Learning Outcome:

Pr No	CO	LLO	Practical -Laboratory Learning Outcome (LLO)
1	CO305.1 (CO1)	LLO 1.1	Implement a C program using different graphics functions.
2	CO305.2 (CO2)	LLO 2.1	Implement a C program to draw line using DDA algorithm.
3	CO305.2 (CO2)	LLO 3.1	Implement a C program to draw line using Bresenham's algorithm.
4	CO305.2 (CO2)	LLO 4.1	Implement a C program to draw circle using Bresenham's algorithm.
5	CO305.2 (CO2)	LLO 5.1	Implement a C program for Flood fill algorithm.
6	CO305.2 (CO2)	LLO 6.1	Implement a C program for Boundary fill algorithm.
7	CO305.3 (CO3)	LLO 7.1	Implement a C program for 2D Translation and Scaling
8	CO305.3 (CO3)	LLO 8.1	Implement a C program for 2D Rotation.
9	CO305.3 (CO3)	LLO 9.1	Implement a C program for 2D Reflection and Shear.
10	CO305.3 (CO3)	LLO 10.1	Implement a C program for 3D Translation and Scaling.
11	CO305.3 (CO3)	LLO 11.1	Implement a C program for 3D Rotation
12	CO305.4 (CO4)	LLO 12.1	Implement a C program for Line Clipping using Cohen- Sutherland algorithm.
13	CO305.4 (CO4)	LLO 13.1	Implement a C program for Line Clipping using Midpoint Subdivision algorithm.
14	CO305.4 (CO4)	LLO 14.1	Implement C program for Sutherland Hodgeman Polygon Clipping.
15	CO305.5 (CO5)	LLO 15.1	Implement a C program for Bezier Curve.

• **Practical Plan:**

Sr No	COs & LLOs	Practical Titles	Date of Plan		Remark/ Assessment Date with Staff sign
			From	To	
1	CO 1 LLO 1.1	Write a C program to draw various graphics objects (Pixel, Circle, Line, Ellipse, Rectangle, Triangle, Polygon) using graphics functions.	A-01/07/26	A-09/07/26	
			B-03/07/26	B-10/07/26	
			C-04/07/26	C-11/07/26	
2	CO2 LLO 2.1	Write a C program to draw line using DDA algorithm.	A-09/07/26	A-16/07/26	
			B-10/07/26	B-17/07/26	
			C-11/07/26	C-18/07/26	
3	CO 2 LLO 3.1	Write a C program to draw line using Bresenham's algorithm.	A-16/07/26	A-23/07/26	
			B-17/07/26	B-24/07/26	
			C-18/07/26	C-25/07/26	
4	CO 2 LLO 4.1	Write a C program to draw circle using Bresenham's algorithm.	A-23/07/26	A-30/07/26	
			B-24/07/26	B-31/07/26	
			C-25/07/26	C-01/07/26	
5	CO 2 LLO 5.1	Write a C program for Flood fill algorithm of polygon filling.	A-30/07/26	A-06/08/26	
			B-31/07/26	B-07/08/26	
			C-01/07/26	C-08/08/26	
6	CO 2 LLO 6.1	Write a C program for Boundary fill algorithm of polygon filling.	A-06/08/26	A-13/08/26	
			B-07/08/26	B-14/08/26	
			C-08/08/26	C-15/08/26	
7	CO 3 LLO 7.1	Write a C program for 2D Translation and Scaling.	A-13/08/26	A-20/08/26	
			B-14/08/26	B-21/08/26	
			C-22/08/26	C-29/08/26	
8	CO 3 LLO 9.1	Write a C program for 2D Reflection and Shear.	A-20/08/26	A-27/08/26	
			B-21/08/26	B-28/08/26	
			C-29/08/26	C-05/09/26	
9	CO 3 LLO 10.1	Write a C program for 3D Translation and Scaling.	A-27/08/26	A-03/09/26	
			B-28/08/26	B-04/09/26	
			C-05/09/26	C-12/09/26	
10	CO 3 LLO 11.1	Write a C program for 3D Rotation.	A-03/09/26	A-10/09/26	
			B-04/09/26	B-11/09/26	
			C-12/09/26	C-19/09/26	
11	CO 4 LLO 12.1	Write a C program for Line Clipping using Cohen-Sutherland algorithm.	A-10/09/26	A-17/09/26	
			B-11/09/26	B-18/09/26	
			C-19/09/26	C-26/09/26	
12	CO 5 LLO 15.1	Write a C program for Bezier Curve.	A-17/09/26	A-24/09/26	
			B-18/09/26	B-25/09/26	
			C-26/09/26	C-03/10/26	

• Learning Assessment (Practical) :

A. Formative assessment (FA-PR)

- For the Formative Assessment (FA-PR) each experiment will be assessed out of 25 marks. Practical will be assessed considering 60% weightage to process and 40% weightage to product.
- Final term work (FA-PR) of 25 marks is calculated based on scored in Formative Assessment for each experiment
Term Work Marks = $(25 \times \text{Total Marks Obtained in FA-PR}) / 25 \times \text{Total Number of Experiments}$

• Self-Learning(SLA): Self learning

Self-learning Activities (SLA) includes micro project / assignment / Any computer graphics course on NPTEL, MOOCs and it will be evaluated out of 25 Marks

• Laboratory Equipment / Instruments / Tools / Software required

- Computer system - (Any computer system with basic configuration)
- 'C' Compiler – Turbo 'C', Developer C/ C++, CodeLite, Sublime Text, Visual Studio

• References:

1. SUGGESTED LEARNING MATERIALS / BOOKS:

Sr. No	Author	Title	Publisher with ISBN Number
1	Donald Hearn , M Pauline Baker	Computer Graphics	Prentice-Hall • ISBN-10 : 0131615300 • ISBN-13 : 978-0131615304
2	William M. Newman Robert F. Sproull	Principles of Interactive Computer Graphics	McGraw-Hill • ISBN: 978-0-07-046338-7
3	Zhigang Xiang, Roy Plastock	Computer Graphics	Schaum O Series • ISBN: 9789389538847 • ISBN: 938953884X
5	Atul P. Godse, Dr. Deepali A. Godse	Computer Graphics	Technical Publications ISBN 933322338X, 9789333223386

2. LEARNING WEBSITES & PORTALS:

Sr. No	Link /Portal	Description
1	https://www.javatpoint.com/computer-graphics-programs	Basic graphics programs
2	https://www.tutorialspoint.com/computer_graphics/index.htm	Basics of Computer graphics
3	https://www.educba.com/line-drawing-algorithm/	Line drawing algorithm
4	https://www.javatpoint.com/computer-graphics-clipping	Clipping Algorithms
5	https://www.tutorialspoint.com/computer_graphics/computer_graphics_curves.htm	Curves in computer
6	https://www.tutorialspoint.com/computer_graphics/2d_transformation.htm	2D and 3D Transformation
7	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_01384200894190387210361_shared/overview	Project on Computer Graphics

3. URLs of referred YouTube Videos:

Sr. No	URLs/Link	Description
1	https://www.youtube.com/watch?v=Kp8Za-JkRuc	DDA line drawing Algorithm
2	https://youtu.be/KnvbUiSxvbM?si=YP-377HDwNF1k89N	Web Designing
3	https://www.youtube.com/watch?v=fneoVtZx9iA	Liang Basrky Algorithm
4	https://www.youtube.com/watch?v=EQxxjyGLE1I	Cyres Beck Line clipping Algorithm
5	https://www.youtube.com/watch?v=OGW9Cqr5RRg	Sutherland Hodgeman Polygon Clipping Algorithm with Numerical
6	https://www.youtube.com/watch?v=z5CqHStw_HA	DDA Curve Generation
7	https://www.youtube.com/watch?v=zjdfotio1XI	Bezier Curve
8	https://www.youtube.com/watch?v=83Nsel2uv6k	B Spline Curve in Computer Graphics

4. Self-Prepared Video URLs:

Sr. No	URLs/Link	Description
1	https://youtu.be/RyNi-A2DL9U	Basics of Computer Graphics
2	https://youtu.be/E0aWM5Rxz08	Raster Scan Graphics
3	https://youtu.be/4MNzrVrxPkU	Line, Circle Drawing Algorithms
4	https://youtu.be/_niJFnoZkCk	Introduction to Transformation
5	https://youtu.be/dCA2z8bltPE	Windowing & Clipping
6	https://youtu.be/XFVxz2wFtvk	Introduction to Curves
7	https://youtu.be/zMjXisne_7c	Types of Curves

5. Tools for Teaching and Assessment:

- MKCL Learn-Live for MCQ Based Quiz.
- Quiz using Google Forms.
- Computer system - Any computer system with basic configuration
- 'C' Compiler – Turbo 'C', Developer C/ C

Miss. S. R. Nikam
(Name & signature of staff)

Prof. M. B. Bhosale
(Name & signature of HOD)

CC-

1. Lab File
2. CGR - 313001 Course File
3. Notice Board / ERP
4. Institute Website / CIAAN Coordinator
5. Progressive Assessment