Maharashtra State Board of Technical Education, Mumbai

K-1

TEACHING PLAN (TP)/COURSE INFORMATION SHEET (CIS)

Academic Year: 2026-27 Date: 01/07/2026

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-Win **Semester:** IIIrd **Scheme:** K

Total Hrs: 15 Hrs. **Name of Faculty:** Ms. S. R. Nikam

• Teaching and Examination Scheme:

Course Title	Course Code/ Abbr	Course Category	Learning Scheme					Credits	Paper Duration	Assessment Scheme										
			Actual Contact Hrs/Week			SLH	NLH			Theory				Based on LL & TSL Practical				Based on SL		Total Marks
										FA TH	SA TH	Total		FA-PR		SA-PR		SLA		
			CL	TL	LL					Max	Max	Max	Min	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

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination , @$ Internal Online Examination

• Course Outcomes (COs): Theory & Practical

By learning course Computer Graphics (CGR-313001) Second Year students will be able to:

CO No.	TLO No.	Course Outcomes (COs) / Theory Learning Outcomes (TLOs)
CO305.1 (CO1)		**Manipulate Visual and Geometric information of Images.**
	TLO 1.1	Describe coordinate system.
	TLO 1.2	Select and use various graphics file formats.
	TLO 1.3	Use different graphics functions and standards.
CO305.2 (CO2)		**Develop programs in C applying standard graphics algorithms.**
	TLO 2.1	Apply Line Drawing algorithms to generate Line.
	TLO 2.2	Apply Circle Drawing algorithms to generate Circle.
	TLO 2.3	Apply Polygon Filling algorithms to Fill Polygon.
CO305.3 (CO3)		**Perform and Demonstrate basic and composite graphical transformations on given object.**
	TLO 3.1	Perform various transformations on given graphics object.
	TLO 3.2	Use composite transformations.
	TLO 3.3	Write need of homogeneous coordinates
CO305.4 (CO4)		**Implement various Clipping algorithms.**
	TLO 4.1	Define: Windowing and Clipping.
	TLO 4.2	Apply Clipping algorithms for Line and Polygon.
CO305.5 (CO5)		**Develop programs to create Curves.**
	TLO 5.1	Draw various Curves using Curve generation algorithms.
	TLO 5.2	Identify different types of Projections.

- **Teaching Plan:**

Unit No. (Allotted Hrs & Marks)	COs & TLOs	Title/Topic Details with CO	Plan (From-To & No. of Lectures)	Actual Execution (From-To & No. of Lectures)	Teaching Method/ Media	Remark
01 (02)	CO1 TLO 1.1 1.2	**Unit - I Basics of Computer Graphics** 1.1 Coordinate system 1.2 Graphics file formats: Basics, advantages, disadvantages – BMP – GIF – JPEG – TIFF – PCX	04/07/2026 to 04/07/2026 (01)		Chalk, Board, PPT + LCD Projector Notes	
	1.3	1.3 Graphics functions & standards: Text mode, Graphic mode, Shapes, Colors, Graphics standards.	11/07/2026 to 11/07/2026 (01)		Chalk, Board, MKCL ERA Learn Live	
02 (04)	CO2 TLO 2.1	**Unit - II Raster Scan Graphics** 2.1.1 Line Drawing Algorithms : Digital Differential Analyzer algorithm	18/07/2026 to 18/07/2026 (01)		Chalk, Board, PPT + LCD Notes	
	2.1	2.1.2 Bresenham's algorithm.	18/07/2026 to 18/07/2026 (01)		Chalk, Board, PPT Notes	
	2.2	2.2 Circle Generation- Symmetry of Circle, Bresenham's algorithm	01/08/2026 to 01/08/2026 (01)		Chalk, Board, PPT Notes	
	2.3	2.3 Polygon Filling: Seed Fill algorithms- Flood Fill algorithm, Boundary Fill algorithm.	08/08/2026 to 08/08/2026 (01)		Projector Notes, MKCL ERA Learn Live,	
03 (04)	CO3 TLO 3.1	**Unit - III Overview of 2D And 3D Transformations** 3.1 Basic Transformations: Translation, Scaling, Rotation, Reflection, Shear.	22/08/2026 to 22/08/2026 (01)		Chalk, Board, PPT + LCD Projector Notes,	
	3.1	3.2 Matrix representations & homogeneous coordinates	29/08/2026 to 29/08/2026 (01)		Chalk, Board, PPT + LCD Projector	
	3.2	3.3 Composite transformations.	05/09/2026 to 05/09/2026 (01)		Chalk, Board, PPT + LCD Projector	
	3.3	3.4 Three-dimensional transformation.	12/09/2026 to 12/09/2026 (01)		LCD Projector MKCL ERA Learn Live	

04 (03)	CO4 TLO 4.1	**Unit - IV Windowing and Clipping Techniques** 4.1 Windowing concepts.	19/09/2026 to 19/09/2026 (01)		Chalk, Board, PPT + LCD Projector	
	4.2	4.2 Line Clipping: Cohen Sutherland Line Clipping algorithm, Mid-Point Subdivision Line clipping algorithm.	26/09/2026 to 26/09/2026 (01)		Chalk, Board, PPT Notes	
	4.2	4.3 Polygon Clipping: Sutherland Hodgeman Polygon clipping algorithm.	03/10/2026 to 03/10/2026 (01)		Chalk, Board, Notes,	
05 (02)	CO5 TLO 5.1	**Unit - V Introduction to Curves and Projections** 5.1 Bezier and B-Spline Curves.	10/10/2026 to 10/10/2026 (01)		Chalk, Board, PPT + LCD Projector Notes,	
	5.2	5.2 Projections: Perspective and Parallel Projection and its types.	10/10/2026 to 10/10/2026 (01)		Chalk, Board, PPT + LCD Projector Notes	
		Total	**15**			

- **Chapter wise CO-PO Mapping:**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes PSOs		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	2	2	2	2	1	1	1			
CO2	2	2	2	2	-	1	1			
CO3	2	2	2	2	-	1	1			
CO4	2	2	2	2	-	1	1			
CO5	2	2	2	2	-	1	1			

Legends: - High:03, Medium:02, Low:01, No Mapping:-

Sr. No.	Programme Outcomes (POs)	Programme Specific Outcomes (PSOs)
1	**PO-1** Basic and Discipline Specific Knowledge	**PSO1** Apply acquired skills of programming, networking, hardware & database for computer based problem solving and software development. **PSO-2** Pursue higher studies in the field of Computer Science / Computer Engineering /Information Technology.
2	**PO-2** Problem Analysis	
3	**PO-3** Design/ Development of Solution	
4	**PO-4** Engineering Tools	
5	**PO-5** Engineering Practices for Society, Sustainability and Environment	
6	**PO-6** Project Management	
7	**PO-7** Life Long Learning	

- **Weightage to Learning Efforts & Assessment Purpose (Specification Table)**

Unit No.	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	Basics of Computer Graphics	CO1	2	0	0	0	0
2	Raster Scan Graphics	CO2	4	0	0	0	0
3	Overview of 2D And 3D Transformations	CO3	4	0	0	0	0
4	Windowing and Clipping Techniques	CO4	3	0	0	0	0
5	Introduction to Curves and Projections	CO5	2	0	0	0	0
		Total :	**15**	**0**	**0**	**0**	**0**

*# **Learning Levels with reference to Bloom's Taxonomy:** R Level: Remember, U Level: Understand, A-Level: Apply*

- **Formative & Summative Assessment Criteria:**

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* Total Marks Obtained in FA-PR) / 25*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

- **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_gr aphics_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_013842008941903872103 61_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 Barsky Algorithm
4	https://www.youtube.com/watch?v=EQxxjyGLe1I	Cyrus 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++.

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

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

CC-

1. CGR-313001 Course File
2. Notice Board / ERP
3. Institute Website / CIAAN Coordinator