



L. D. College of Engineering, Ahmedabad – 15

LESSON PLAN

| Over all Term Planning | |
|----------------------------|----------------------------------|
| Branch: | Information Technology |
| Semester: | B.E 5 th SEM |
| Subject Name: | Computer Graphics |
| Subject Code: | 2151603 |
| Affiliating University: | Gujarat Technological University |
| Starting date of the term: | 18-06-2018 |
| Ending date of the term: | 17-10-2018 |
| Course Teacher: | Prof. M. K. Panchal |

University Structure of the subject:

| Teaching Scheme | | | Credits C | Examination Marks | | | | | | Total Marks |
|-----------------|-----|-----|--------------|-------------------|----|---------|-----------------|-----------|----|----------------|
| L | T | P | | Theory Marks | | | Practical Marks | | | |
| | | | ESE (E) | PA (M) | | ESE (V) | | PA (I) | | |
| PA | ALA | ESE | | OEP | | | | | | |
| 4 | 0 | 2 | 6 | 70 | 20 | 10 | 20 | 10 | 20 | 150 |

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester

Examination; PA- Progressive Assessment;

Syllabus:

| Sr. No. | Content | Total Hrs | % Weightage |
|---------|---|-----------|-------------|
| 1 | Basic of Computer Graphics: Basic of Computer Graphics, Applications of computer graphics, Display devices, Random and Raster scan systems, Graphics input devices, Graphics software and standards | 6 | 15% |

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| 2 | Graphics Primitives: Points, lines, circles and ellipses as primitives, scan conversion algorithms for primitives, Fill area primitives including scan-line polygon filling, inside-outside test, boundary and flood-fill, character generation, line attributes, area-fill attributes, character attributers. | 8 | 20% |
| 3 | 2D transformation and viewing: Transformations (translation, rotation, scaling), matrix representation, homogeneous coordinates, composite transformations, reflection and shearing, viewing pipeline and coordinates system, window-to-viewport transformation, clipping including point clipping, line clipping (cohen-sutherland, liang- bersky, NLN), polygon clipping | 8 | 20% |
| 4 | 3D concepts and object representation: 3D display methods, polygon surfaces, tables, equations, meshes, curved lies and surfaces, quadric surfaces, spline representation, cubic spline interpolation methods, Bazier curves and surfaces, B-spline curves and surfaces | 6 | 15% |
| 5 | 3D transformation and viewing: 3D scaling, rotation and translation, composite transformation, viewing pipeline and coordinates, parallel and perspective transformation, view volume and general (parallel and perspective) projection transformations | 8 | 20% |
| 6 | Advance topics: visible surface detection concepts, back-face detection, depth buffer method, illumination, light sources, illumination methods (ambient, diffuse reflection, specular reflection), Color models: properties of light, XYZ, RGB, YIQ and CMY color models | 6 | 10% |

Reference Books:

1. Computer Graphics, D.Hearn And P.Baker - Pearson Eduction - C Version
2. Computer Graphics, with OpenGL Hearn and Baker, - Pearson
3. Computer Graphics, Sinha & Udai, - TMH
4. Computer Graphics, Foley and van Dam - Person Education

Lesson Plan

| Sr. No. | Topic | Planned Date (Div A) | Actual Date (Div A) | Planned Date (Div B) | Actual Date (Div B) | Mode of Delivery | Resources required |
|---------|---|-------------------------|------------------------|-------------------------|------------------------|------------------|--------------------|
| 1 | Transformations (translation, rotation, scaling), matrix representation Quiz on transformation Video on Use of transformation | 19/06/18 28/06/18 | | 18/6/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 2 | Homogeneous coordinates, composite transformations Using composite transformation do transformation of polygon | 03/07/18 | | 22/6/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 3 | reflection and shearing Presentation by students on current application on above topic | 05/07/18 | | 25/6/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 4 | End of Chapter Quiz | 10/07/18 | | 29/6/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 5 | viewing pipeline and coordinates system Quiz | 12/07/18 | | 02/7/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 6 | Window-to-viewport transformation, clipping including point clipping Presentation by students | 17/07/18 | | 06/7/08 | | Chalk Board/ppt | Hand Outs/ppt |
| 7 | Line clipping (cohen-sutherland) Video on applications of clipping | 19/07/18 | | 09/7/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 8 | Liang- bersky, NLN Presentation on comparative analysis of different line clipping algorithm | 24/07/18 | | 13/7/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 9 | Polygon clipping | 26/07/18 | | 16/7/18 | | Chalk Board/ppt | Hand Outs/ppt |

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| 10 | End of Chapter Quiz | 02/08/18 | | 20/7/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 11 | 3D scaling and translation Real time application usage of 3D scaling and translation | 07/08/18 | | 23/7/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 12 | 3D rotation Problem solving exercise on 3D rotation | 09/08/18 | | 27/7/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 13 | Composite transformation | 14/08/18 | | 30/7/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 14 | Viewing pipeline and coordinates, | 16/08/18 | | 03/8/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 15 | Parallel transformation | 21/08/18 | | 6/08/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 16 | Perspective transformation | 23/08/18 | | 10/8/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 17 | View volume and general (parallel and perspective) projection transformations | 28/08/18 | | 13/8/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 18 | End of Chapter Quiz | 30/08/18 | | 20/8/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 19 | visible surface detection concepts Current technology used in visible surface detection | 04/09/18 | | 24/8/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 20 | back-face detection Quiz on surface detection technique | 07/09/18 | | 27/8/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 21 | depth buffer method | 11/09/18 | | 31/8/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 22 | illumination, light sources Presentation on history and future of illumination by students | 14/09/18 | | 7/9/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 23 | illumination methods (ambient, diffuse reflection, specular reflection) Presentation by students on comparison of methods | 18/09/18 | | 10/9/18 | | Chalk Board/ppt | Hand Outs/ppt |
| 24 | Color models: properties of light, XYZ, RGB, YIQ and CMY color models | 20/09/18 | | 14/9/18 | | Chalk Board/ppt | Hand Outs/ppt |

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|----|------------------------------|----------|--|---------|--|-----------------|---------------|
| | Video on use of color models | | | | | | |
| 25 | End of Chapter Quiz | 25/09/18 | | 17/9/18 | | Chalk Board/ppt | Hand Outs/ppt |

Prof. M. K. Panchal

Department of Information Technology

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