

**Text Books:**

1. Communication Networks – Fundamental Concepts & key architectures, Alberto Leon Garcia & Indra Widjaja, 2<sup>nd</sup> Edition, Tata McGraw-Hill, India  
(7 - excluding 7.6, 8)
2. Computer & Communication Networks, Nadir F Mir, Pearson Education, India  
(9, 10 excluding 10.7, 12.1 to 12.3, 16, 17.1 to 17.6, 18.1 to 18.3, 18.5, 19, 20)

**Reference Books:**

1. Behrouz A. Forouzan: Data Communications and Networking, 4<sup>th</sup> Edition, Tata McGraw-Hill, 2006.
2. William Stallings: Data and Computer Communication, 8<sup>th</sup> Edition, Pearson Education, 2007.
3. Larry L. Peterson and Bruce S. Davie: Computer Networks – A Systems Approach, 4<sup>th</sup> Edition, Elsevier, 2007.
4. Wayne Tomasi: Introduction to Data Communications and Networking, Pearson Education, 2005.

**COMPUTER GRAPHICS AND VISUALIZATION**

**Subject Code:** 10CS65  
**Hours/Week :** 04  
**Total Hours :** 52

**I.A. Marks :** 25  
**Exam Hours:** 03  
**Exam Marks:** 100

**PART - A****UNIT – 1****7 Hours**

**Introduction:** Applications of computer graphics; A graphics system; Images: Physical and synthetic; Imaging Systems; The synthetic camera model; The programmer's interface; Graphics architectures; Programmable Pipelines; Performance Characteristics  
**Graphics Programming:** The Sierpinski gasket; Programming Two Dimensional Applications.

**UNIT – 2****6 Hours**

**The OpenGL:** The OpenGL API; Primitives and attributes; Color; Viewing; Control functions; The Gasket program; Polygons and recursion; The three-dimensional gasket; Plotting Implicit Functions

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**UNIT - 3****7 Hours**

**Input and Interaction:** Interaction; Input devices; Clients and Servers; Display Lists; Display Lists and Modeling; Programming Event Driven Input; Menus; Picking; A simple CAD program; Building Interactive Models; Animating Interactive Programs; Design of Interactive Programs; Logic Operations

**UNIT - 4****6 Hours**

**Geometric Objects and Transformations-I:** Scalars, Points, and Vectors; Three-dimensional Primitives; Coordinate Systems and Frames; Modeling a Colored Cube; Affine Transformations; Rotation, Translation and Scaling;

**PART - B****UNIT - 5****5 Hours**

**Geometric Objects and Transformations-II:** Geometric Objects and Transformations; Transformation in Homogeneous Coordinates; Concatenation of Transformations; OpenGL Transformation Matrices; Interfaces to three-dimensional applications; Quaternion's.

**UNIT - 6****7 Hours**

**Viewing:** Classical and computer viewing; Viewing with a Computer; Positioning of the camera; Simple projections; Projections in OpenGL; Hidden-surface removal; Interactive Mesh Displays; Parallel-projection matrices; Perspective-projection matrices; Projections and Shadows.

**UNIT - 7****6 Hours**

**Lighting and Shading:** Light and Matter; Light Sources; The Phong Lighting model; Computation of vectors; Polygonal Shading; Approximation of a sphere by recursive subdivisions; Light sources in OpenGL; Specification of materials in OpenGL; Shading of the sphere model; Global Illumination.

**UNIT - 8****8 Hours**

**Implementation:** Basic Implementation Strategies; Four major tasks; Clipping; Line-segment clipping; Polygon clipping; Clipping of other primitives; Clipping in three dimensions; Rasterization; Bresenham's algorithm; Polygon Rasterization; Hidden-surface removal; Antialiasing; Display considerations.

**Text Books:**

1. Edward Angel: Interactive Computer Graphics A Top-Down Approach with OpenGL, 5<sup>th</sup> Edition, Pearson Education, 2008. (Chapters 1 to 7)

**Reference Books:**

1. Donald Hearn and Pauline Baker: Computer Graphics- OpenGL Version, 3<sup>rd</sup> Edition, Pearson Education, 2004.

  
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2. F.S. Hill Jr.: Computer Graphics Using OpenGL, 3<sup>rd</sup> Edition, PHI, 2009.
3. James D Foley, Andries Van Dam, Steven K Feiner, John F Hughes, Computer Graphics, Pearson Education 1997.

## OPERATIONS RESEARCH

**Subject Code:** 10CS661  
**Hours/Week :** 04  
**Total Hours :** 52

**I.A. Marks :** 25  
**Exam Hours:** 03  
**Exam Marks:** 100

### PART - A

#### UNIT - 1

**6 Hours**

**Introduction, Linear Programming – 1:** Introduction: The origin, nature and impact of OR; Defining the problem and gathering data; Formulating a mathematical model; Deriving solutions from the model; Testing the model; Preparing to apply the model; Implementation .  
**Introduction to Linear Programming:** Prototype example; The linear programming (LP) model.

#### UNIT - 2

**7 Hours**

**LP – 2, Simplex Method – 1:** Assumptions of LP; Additional examples. The essence of the simplex method; Setting up the simplex method; Algebra of the simplex method; the simplex method in tabular form; Tie breaking in the simplex method

#### UNIT - 3

**6 Hours**

**Simplex Method – 2:** Adapting to other model forms; Post optimality analysis; Computer implementation  
 Foundation of the simplex method.

#### UNIT - 4

**7 Hours**

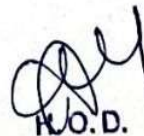
**Simplex Method – 2, Duality Theory:** The revised simplex method, a fundamental insight.  
 The essence of duality theory; Economic interpretation of duality, Primal dual relationship; Adapting to other primal forms

### PART - B

#### UNIT - 5

**7 Hours**

**Duality Theory and Sensitivity Analysis, Other Algorithms for LP :** The role of duality in sensitive analysis; The essence of sensitivity analysis;

  
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