	L	T	P	EL	CREDITS
GE6251 ENGINEERING GRAPHICS	**2**	**0**	**4**	**3**	**5**

OBJECTIVES

- To develop in students, graphic skills for communication of concepts, ideas and design of engineering products and expose them to existing national standards related to technical drawings.

MODULE I :	**L**	**T**	**P**	**EL**
	2	**0**	**4**	**3**

Importance of Graphics in Engineering Applications – Use of Drafting Instruments – BIS Conventions and Specifications – Size, Layout and Folding of Drawing Sheets – Lettering and Dimensioning.

SUGGESTED ACTIVITIES :

- Demonstration using CAD software to bring out the concepts presented in the subject
- Hands on practicals on open source software

SUGGESTED EVALUATION METHODS:

- Quizzes

MODULE II :	**L**	**T**	**P**	**EL**
	2	**0**	**4**	**3**

Basic Geometrical Constructions, Curves used in Engineering Practices - Conics –Construction of Ellipse,Parabola and Hyperbola by Eccentricity Method – Construction of Cycloid – Construction of Involutes of Square and Circle – Drawing of Tangents and Normal to the above Curves.

SUGGESTED ACTIVITIES :

- Videos of application of Geometric curves in various domains
- Theory and mathematics in class
- EL – Practical Problems
- Practical –Construction of curves

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE III :	**L**	**T**	**P**	**EL**
	2	**0**	**4**	**3**

Visualization Concepts and Free Hand Sketching: Visualization Principles – Representation of Three Dimensional Objects – Layout of Views - Free Hand Sketching of Multiple Views from Pictorial Views of Objects

SUGGESTED ACTIVITIES :

- Building models using various media
- Discussing uses of multiple views in various fields
- Practical - Construction of 3D views

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE IV :	L	T	P	EL
	2	0	4	3

Orthographic Projection- Principles - Principal Planes - First Angle Projection - Projection of Points. Projection of Straight Lines (only First Angle Projections) Inclined to Both the Principal Planes - Determination of True Lengths and True Inclinations by Rotating Line Method and Trapezoidal Method and Traces

SUGGESTED ACTIVITIES :

- Videos of application of projections in various domains
- Theory and mathematics in class
- EL – Practical Problems in orthographic projection of points
- Practical –Construction of curves

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE V :	L	T	P	EL
	2	0	4	3

Projection of Planes (Polygonal and Circular Surfaces) Inclined to both the Principal Planes by Rotating Object Method.

SUGGESTED ACTIVITIES :

- Videos of application of projections in various domains
- Theory and mathematics in class
- EL – Practical Problems in orthographic projection of planes

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE VI:	L	T	P	EL
	2	0	4	3

Projection of Simple Solids like Prisms, Pyramids, Cylinder, Cone and Truncated Solids when the Axis is Inclined to both the Principal Planes by Rotating Object Method and Auxiliary Plane Method.

SUGGESTED ACTIVITIES :

- Introduction in class
- Models making
- Videos/software demonstrations

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE VII	L	T	P	EL
	2	0	4	3

Sectioning of Solids in Simple Vertical Position when the Cutting Plane is Inclined to the one of the Principal Planes and Perpendicular to the other – Obtaining True Shape of Section.

SUGGESTED ACTIVITIES :

- Introduction in class
- Models
- Videos */*software demonstrations

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE VIII	**L**	**T**	**P**	**EL**
	2	**0**	**4**	**3**

Development of Lateral Surfaces of Simple and Sectioned Solids – Prisms, Pyramids Cylinders and Cones. Development of Lateral Surfaces of Solids with Cut-Outs and Holes.

SUGGESTED ACTIVITIES :

- Development models in cardboard
- Software demonstration

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

MODULE IX:	**L**	**T**	**P**	**EL**
	2	**0**	**4**	**3**

Principles of Isometric Projection – Isometric Scale – Isometric Projections of Simple Solids and Truncated Solids - Prisms, Pyramids, Cylinders, Cones - Combination of Two Solid Objects in Simple Vertical Positions and Miscellaneous Problems.

SUGGESTED ACTIVITIES :

- Videos
- Demonstrations using Solid modeling software

SUGGESTED EVALUATION METHODS:

- Assignment problems
- Quizzes

MODULE X	**L**	**T**	**P**	**EL**
	2	**0**	**4**	**3**

Perspective Projection of Simple Solids - Prisms, Pyramids and Cylinders by Visual Ray Method and Vanishing Point Method.

SUGGESTED ACTIVITIES :

- Videos
- Illustration using Advertisements

SUGGESTED EVALUATION METHODS:

- Tutorial problems
- Assignment problems
- Quizzes

OUTCOMES:

Upon completion of the course, the students will be able to:

- Perform free hand sketching of basic geometrical shapes and multiple views of objects.
- Draw orthographic projections of lines, planes and solids
- Obtain development of surfaces.
- Prepare isometric and perspective views of simple solids.

TEXT BOOK:

1. N.D.Bhatt and V.M.Panchal, “Engineering Drawing”, Charotar Publishing House, 50th Edition, 2010.

REFERENCES:

1. K.R.Gopalakrishna., “Engineering Drawing” (Vol I&II combined) SubhasStores, Bangalore, 2007
2. Luzzader, Warren.J., and Duff,John M.,,’’ Fundamentals of Engineering Drawingwith an introduction to Interactive Computer Graphics for Design and Production”,Eastern Economy Edition, Prentice Hall of India Pvt Ltd, New Delhi, 2005
3. M.B.Shah and B.C.Rana, “Engineering Drawing”, Pearson, 2nd Edition, 2009
4. K.Venugopal and V.Prabhu Raja, “Engineering Graphics”, New Age International (P)Limited ,2008.
5. K. V.Natarajan, “A text book of Engineering Graphics”, 28th Edition, Dhanalakshmi Publishers, Chennai, 2015.
6. BasantAgarwal and Agarwal C.M., “Engineering Drawing”, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
7. N.S Parthasarathy and Vela Murali, “ Engineering Drawing”, Oxford University Press, 2015.

Publication of Bureau of Indian Standards:

1. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets
2. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
3. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
4. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods.

EVALUATION METHOD TO BE USED:

Sl. no	Category of Courses	Continuous Assessment	Mid – Semester Assessment	End Semester
1.	**Theory**	**40**	**20**	**40**