LOK JAGRUTI UNIVERSITY (LJU)

INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Civil Engineering (709)

Bachelor of Engineering (B.E.) – Semester – II

Course Code:	**017092291**
Course Name:	**Engineering Graphics**
Category of Course:	Engineering Science Course (ESC)
Prerequisite Course:	---

Teaching Scheme				
Lecture (L)	**Tutorial (T)**	**Practical (P)**	**Credit**	**Total Hours**
4	**2**	**0**	**6**	**60**

Syllabus

Unit No.	Topic	Prerequisite Topic	Successive Topic	Teaching Hours
01	**Introduction to Engineering Graphics**			**5 (8.5%)**
	1.1 Importance and applications of engineering drawing	---	Design and Drawing of Residential and Public Building (017093403 - Unit-5)	
	1.2 Introduction of drawing instruments	---		
	1.3 Introduction to BIS standards in drawing practice	---		
	1.4 Types of lines and its application	---		
	1.5 Lettering	---		
	1.6 Sheet layout	---		
	1.7 Dimensioning systems	---		
	1.8 Geometrical Construction	---		
02	**Scale**			**3 (5%)**
	2.1 Types of standard scale and representative fraction	Introduction to Engineering Graphics (017082291 - Unit-1)	Planning of Residential and Public Building (017093403 - Unit-4) Plane Table Surveying (017093404 - Unit-1)	
	2.2 Plain scale			
	2.3 Diagonal scale			
03	**Engineering Curves**			**8 (13%)**
	3.1 Classification of curves, Introduction of conics curves	Introduction to Engineering Graphics (017082291 - Unit-1)	Design of Horizontal Alignment (017093502- Unit-3), Design of Vertical Alignment Engineering (017093502- Unit- 4) Application of Surveying in Construction (017093404 - Unit-10)	
	3.2 Different construction methods for an ellipse, parabola and hyperbola			
	3.3 Construction cycloidal curves - cycloid, epicycloid and hypocycloid			
	3.4 Construction of Involutes - line, polygon and circle			
	3.5 Construction of Spiral - Archimedean spiral and Logarithmic spiral			
04	**Projections of Points and Lines**			**8 (13%)**
	4.1 Introduction to projection and planes of projections	Introduction to Engineering Graphics (017082291 - Unit-1)	Computer Aided Drawing (2D) of Residential Buildings (017093403 - Unit-6) Perspective Drawing (017093403 - Unit-7)	
	4.2 Various possible locations of a point			
	4.3 Orthographic projections of points on two principal reference planes			
	4.4 Projections of points on three principle reference planes			
	4.5 Introduction to projection of line			
	4.6 Projections of line parallel and perpendicular with principal reference planes			
	4.7 Projections of line with its inclination to one / two principal reference plane			
05	**Projections of Planes**			**8 (13%)**
	5.1 Introduction of projections of planes	Projections of Points and Lines (017082291 - Unit-4)	Perspective Drawing (017093403 - Unit-7)	
	5.2 Different types of plane based on shapes- polygons, circle and ellipse			
	5.3 Plane parallel to one principal plane and perpendicular to other			
	5.4 Plane inclined to one principal plane and perpendicular to other			
	5.5 Plane inclined to all principal plane or oblique plane			
06	**Projection of Solids**			**6 (10%)**
	6.1 Classification of solids	Projections of Planes (017082291 - Unit-5)	---	
	6.2 Definitions of different types of solids			
	6.3 Projections of different solids and frustum of solids with its inclination with one and two reference planes			
07	**Sections of Solids**			**4 (7%)**
	7.1 Introduction of various cutting planes	Projections of Solids (017082291 - Unit-6)	Centroid (017093301 Unit-5), Moment of Inertia (017093301 - Unit-6), Direct and Bending Stresses (017093401 -Unit-7)	
	7.2 Concept of Auxiliary Inclined Plane and Auxiliary Vertical plane			
	7.3 Section of various solids and the true shape of the section			
08	**Orthographic Projections**			**6 (10%)**
	8.1 Principles of projector, projections and planes of projections	Projections of Solids (017082291 - Unit-6)		

	8.2 Concepts of methods of projections 8.3 Front view, top view and side views using first angle projection method 8.4 Front view, top view and side views using third angle projection method		Design and Drawing of Residential and Public Building (017093403 - Unit-5) Perspective Drawing (017093403 - Unit-7)	
09	**Sectional Orthographic Projections** 9.1 Introduction 9.2 Types of section 9.3 Full sectional views	Projections of Solids (017082291 - Unit-6), Sections of Solids (017082291 - Unit-7), Orthographic Projections (017082291 - Unit-8)	---	**5 (8.5%)**
10	**Isometric Projections and Isometric View or Drawing** 10.1 Isometric scale 10.2 Conversion of orthographic views into isometric view or drawing 10.3 Conversion of orthographic views into isometric projection	Orthographic Projections (017082291 - Unit-8)	---	**7 (12%)**

Proposed Theory + Practical Evaluation Scheme by Academicians (% Weightage Category Wise and it's Marks Distribution)					
L:	**4**	**T:**	**2**	**P:**	**0**
Note: In Theory Group, Total 4 Test (T1+T2+T3+T4) will be conducted for each subject. Each Test will be of 25 Marks. Each Test Syllabus Weightage: Range should be 20% - 30%					
Group (Theory or Practical)	**Group (Theory or Practical) Credit**	**Total Subject Credit**	**Category**	**% Weightage**	**Marks Weightage**
Theory	**6**	**6**	MCQ	20%	20
Theory			Theory Descriptive	10%	10
Theory			Formulas and Derivation	0%	0
Theory			Numerical	70%	70
Expected Theory %	**100%**		**Calculated Theory %**	**100%**	**100**
Practical	**0**		Individual Project	0%	0
Practical			Group Project	0%	0
Practical			Internal Practical Evaluation (IPE)	0%	0
Practical			Viva	0%	0
Practical			Seminar	0%	0
Expected Practical %	**0%**		**Calculated Practical %**	**0%**	**0**
Overall %	**100%**			**100%**	**100**

Course Outcome	
	Upon completion of the course students will be able to
CO1	Understand fundamental principles of engineering graphics, drawing standards, application and be able to draw engineering scale and different engineering curves.
CO2	Understand the concept, application and be able to draw projections of point, projections of line and projections of plane.
CO3	Demonstrate the capability to draw projections of solid geometry, sections of solid, three-dimensional visualization of engineering components through orthographic projections.
CO4	Develop the skill to visualize the internal structures of complex bodies through the effective use of sectional views and acquire the skill to construct 3D isometric views from orthographic pictorial drawings.
Suggested Reference Books	
1	Elementary Engineering Drawing by N.D. Bhatt Charotar Publishing House, Anand.
2	Engineering Graphics by P.J. Shah S. Chand & Company Ltd., New Delhi.
3	Engineering Graphics by P.B. Patel & P.D. Patel, Mahajan publishing house. Ahmedabad.
4	Engineering Drawing by P.S. Gill, S.K. Kataria & sons, Delhi.
5	Engineering Drawing by R.K. Dhawan, S. Chand & Company Ltd., New Delhi.
6	Engineering Drawing by B. Agrawal and C M Agrawal, Tata McGraw Hill, New Delhi.
7	Engineering Graphics – I and II", by Arunoday Kumar, Tech – Max Publication, Pune, 3rd Edition 2010.

List of Open source software	
1	http://nptel.ac.in
2	Autodesk AutoCAD