INSTITUTE OF ENGINEERING AND TECHNOLOGY LOK JAGRUTI UNIVERSITY (LJU)

INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Mechanical Engineering (710)

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

Course Code:	**017102191**
Course Name:	**Engineering Graphics - I**
Category of Course:	Engineering Science Course (ESC)
Prerequisite Course:	---

Teaching Scheme				
Lecture (L)	**Tutorial (T)**	**Practical (P)**	**Credit**	**Total Hours**
3	**1**	**0**	**4**	**40**

Syllabus

Unit No.	Topic	Prerequisite Topic	Successive Topic	Teaching Hours
01	**Introduction to Engineering Graphics**			**3 (7.5%)**
	1.1 Importance and applications of engineering drawing	---	---	
	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	---	---	
02	**Geometrical Construction**			**3 (7.5%)**
	2.1 Draw parallel, perpendicular and inclined lines	Introduction to engineering graphics (017102191-Unit-01)	Cam Profile (017103392– Unit -08)	
	2.2 Divisions of lines and circle			
	2.3 Bisecting lines and angles			
	2.4 Construction of polygons			
03	**Scale**			**4 (10%)**
	3.1 Types of standard scale and representative fraction	---	Cam Profile (017113392– Unit -08), Model Similarities (017113491-Unit-8), Pressure diagrams (017113491-Unit-3.3), Geometric similarity, dynamic similarity, Kinematic similarity (017113491-Unit-8.2),	
	3.2 Plain scale	Geometrical construction (017102191-Unit-02)		
	3.3 Diagonal scale			
04	**Loci of Points**			**4 (10%)**
	4.1 Introduction	---	---	
	4.2 Simple slider crank chain mechanism	Geometrical construction (017102191-Unit-02)	---	
	4.3 Off set slider crank chain mechanism		---	
	4.4 Slider crank with trunnion mechanism		---	
	4.5 A four bar mechanism		---	
	4.6 Pendulum mechanism		---	
	4.7 Combinations of different mechanisms		---	
05	**Engineering Curves - 1**			**5 (12.5%)**
	5.1 Classification of curves	---	---	
	5.2 Introduction of conics curves	---	---	
	5.3 Different construction methods for an ellipse	Geometrical construction (017102191-Unit-02)	---	
	5.4 Different construction methods for parabola		---	
	5.5 Different construction methods for hyperbola		---	
06	**Engineering Curves - 2**			**4 (10%)**
	6.1 Construction cycloidal curves (cycloid, epicycloid and hypocycloid)	Geometrical construction (017102191-Unit-02)	---	
	6.2 Construction of Involutes (line, polygon, circle)		---	
	6.3 Construction of Spiral (Archimedean spiral and Logarithmic spiral)		---	
07	**Projections of Points**			**3 (7.5%)**
	7.1 Introduction to projection and planes of projections	Introduction to engineering graphics (017102191-Unit-01)	---	
	7.2 Various possible locations of a point		---	
	7.3 Orthographic projections of points on two principal reference planes		---	
	7.4 Projections of points on three principle reference planes		---	
08	**Projections of Lines**			**5 (12.5%)**
	8.1 Introduction to projection of line	Projections of points (017102191-Unit-07)	---	
	8.2 Projections of line parallel and perpendicular with principal reference planes		---	
	8.3 Projections of line with its inclination to one principal reference plane		---	
	8.4 Projections of line with its inclination to two principal reference planes		---	

09	**Projections of Planes**			**5 (12.5%)**
	9.1 Introduction of projections of planes	Geometrical construction (017102191-Unit-02), Projections of lines (017102191-Unit-08)	Projections of Solids-1 (017102293-Unit-01)	
	9.2 Different types of plane based on shapes (polygons, circle and ellipse)			
	9.3 Plane parallel to one principal plane and perpendicular to other			
	9.4 Plane inclined to one principal plane and perpendicular to other			
	9.5 Plane inclined to all principal plane or oblique plane			
10	**Computer Graphics**			**4 (10%)**
	10.1 Introduction of AutoCAD	Geometrical construction (017102191-Unit-02)	---	
	10.2 AutoCAD basic draw commands for 2D drawing		---	
	10.3 AutoCAD basic modify commands for 2D drawing		---	

Proposed Theory + Practical Evaluation Scheme by Academicians
(% Weightage Category Wise and it's Marks Distribution)

L:	3	T:	1	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	4	4	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
1	Understand the application of drawing instruments, geometrical construction of basic shapes and types of standard scales used in drawings.
2	Learn the concept of application of loci of points for different mechanism and construction of different engineering curves.
3	Understand the concept of advance engineering curves and basic of projections for points and lines with different orientation in principle reference planes.
4	Understand and apply the concept of projection of planes and learn the overview of the computer aided drafting with draw and modify commands.

Suggested Reference Books

1	Elementary Engineering Drawing by N.D.Bhatt Charotar Publishing House, Anand.
2	Engineering Graphics by P.J. Shah S. Chand and Company Ltd., New Delhi.
3	Engineering Graphics by P.B. Patel and P.D. Patel, Mahajan publishing house. Ahmedabad.
4	Engineering Drawing by P.S. Gill, S.K. Kataria and sons, Delhi.
5	Engineering Drawing by R.K. Dhawan, S. Chand and 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.
8	Engineering Drawing and Graphics, by K. Venugopal, New Age International Publication, 5th Edition.
9	Engineering Drawing and Graphics using Auto CAD 2000 By T. Jeyapoovan, Vikas Publishing House Pvt. Ltd., New Delhi.
10	Engineering Drawing with an Introduction to AutoCAD, by D. A. Jolhe Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 2007.

List of Open Source Software/Learning Website

1	http://nptel.ac.in/
2	Autodesk AutoCAD