

G. PULLAIAH COLLEGE OF ENGINEERING AND TECHNOLOGY

Kurnool – 518002

DEPARTMENT OF MECHANICAL ENGINEERING

Semester –II (2016-2017)

COURSE DESCRIPTION

Course Code	:	15A03101
Course Title	:	ENGINEERING DRAWING
Course Structure	:	Lectures Drawing Credits 0 6 3
Course Coordinator	:	K.Nirmala, Assoc. Professor
Team of Instructors	:	K.Nirmala

I. Course Overview:

One of the best ways to communicate one's ideas is through some form of picture or drawing. This is especially true for the engineer. An engineering drawing course focuses on usage of drawing instruments, lettering, construction of geometric shapes, etc. Students study use of dimensioning, shapes and angles or views of such drawings. Dimensions feature prominently, with focus on interpretation, importance and accurate reflection of dimensions in an engineering drawing. Other areas of study in this course may include projected views, pictorial projections and development of surfaces. This course also gives basic concepts for studying machine drawing, building drawing, circuit drawings etc.

By the end of the course, the successful student will be able to:

1. Interpretation and construction of various curves which include ellipse, parabola, hyperbola, cycloids and helices.
2. Analyse and draw the orthographic projections of points, lines, planes, solids and sectional solids.
3. Analyse and design a two dimensional object from three dimensional object.
4. Estimate and develop the sectional, interpenetration and perspectives projections of solids.
5. Improve their visualization skills in the development of new products.

Total Hours of instruction

II. Prerequisite(s)

Level	Credits	Periods/ Week	Prerequisites
UG	3	6	Basic Mathematics , physics

III. Marks Distribution:

Sessional Marks	University End Exam Marks	Total Marks
There shall be 2 midterm examinations. Each midterm examination consists of subjective and objective tests. The subjective test is for 20 marks, with duration of 90 minutes and objective test is for 10 marks with duration of 20 minutes.	70	100

<p>Subjective paper shall contain 5 questions of which student has answer 3 questions evaluated for 20 marks. The objective paper is set for 20 bits for 10 marks.</p> <p>First midterm examination shall be conducted for the first four units of syllabus and second midterm examination shall be conducted for the remaining four units.</p> <p>The better of the two midterm examination will be taken as the final sessional marks secured by the candidate in the subject.</p>		
--	--	--

Continuous Internal Assessment		
15 Marks Units 1,2,3,4&5	Continuous internal examination (CIE) (2 hours)	All questions need to be answered

IV. EVALUATION SCHEME

S. No	Component	Duration	Marks
1	Mid- I Examination	2 hour	15
2	Drawing charts		15
TOTAL			30
3	Mid- II Examination	2 hour	15
4	Drawing charts		15
TOTAL			30
CIA Examination marks to be considered as average of above two CIA's			
5	EXTERNAL Examination	3 hours	70
GRAND TOTAL			100

V. Course Educational Objectives:

The course should enable the students to

- I. Understand the basic principles of engineering drawing and construction of curves used in engineering field.
- II. Apply the knowledge of interpretation of projection in different quadrants.
- III. Understand the projections of solids, when it is inclined to both planes simultaneously.
- IV. Convert the pictorial views into orthographic view and vice versa.
- V. Create intricate details of components through sections and develop its surfaces.

VI. Course Outcomes:

- I. Interpretation and construction of various curves which include ellipse, parabola, hyperbola, cycloids and helices.
- II. Analyse and draw the orthographic projections of points, lines, planes, solids and sectional solids.
- III. Analyse and design a two dimensional object from three dimensional object.
- IV. Estimate and develop the sectional, interpenetration and perspectives projections of solids.
- V. Improve their visualization skills in the development of new products

VII. How Course Outcomes are assessed:

	Outcome	Level	Proficiency assessed by
A	Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems	S	Exercises
B	Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences	M	Assignments
C	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.	H	Laboratory experiments
D	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.	N	Discussions
E	Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations	H	Tests and assignments
F	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	S	--
G	Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development	S	
H	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice	H	--
I	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings	S	--

J	Communicate effectively on complex engineering activities with the engineering community and with society at large such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.	N	--
K	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's work as a member and leader in a team, to manage projects and in multidisciplinary environments	H	Tests and assignments
I	Recognise the need for, and have the preparation and ability to engage in independent and life long learning in the broadest context of technological change.		

N = None

S = Supportive

H = Highly Related

VIII. Syllabus:

MECHANICS OF SOLIDS

UNIT-I

Introduction to Engineering Drawing: Principles of Engineering Graphics and their Significance- Conventions in Drawing-Lettering – BIS Conventions. Curves used in Engineering Practice. a) Conic Sections including the Rectangular Hyperbola- General method only, b) Cycloid, Epicycloid and hypocycloid.

UNIT-II

Scales: Plain, Diagonal and Vernier.

Projection of Points: Principles of orthographic projection – Convention –First angle projections, projections of points..

UNIT-III

Projections of Lines: lines inclined to one or both planes, Problems on projections, Finding True lengths.

Projections of Planes: Projections of regular plane surfaces- plane surfaces inclined to both planes

UNIT-IV

Projections of Solids: Projections of Regular Solids with axis inclined to both planes. Developments of Solids: Development of Surfaces of Right Regular Solids-Prism, Cylinder, Pyramid, Cone.

UNIT-V

Isometric and Orthographic Projections: Principles of isometric projection- Isometric Scale- Isometric Views- Conventions- Isometric Views of lines, Planes, Simple solids (cube, cylinder and cone). Isometric projections of spherical parts. Conversion of isometric Views to Orthographic Views..

Text Books:

1. Engineering Drawing, N.D. Bhatt, Charotar Publishers
2. Engineering Drawing, K.L. Narayana& P. Kannaih, Scitech Publishers, Chennai

References:

1. Engineering Drawing, Johle, Tata McGraw-Hill Publishers
2. Engineering Drawing, Shah and Rana,2/e, Pearson Education
3. Engineering Drawing and Graphics, Venugopal/New age Publishers
4. Engineering Graphics, K.C. John, PHI,2013
5. Engineering Drawing, B.V.R. Guptha, J.K. Publishers

IX. Course Plan:

The course plan is meant as a guideline. There may probably be changes.

Lecture No.	Course learning outcomes	Topics to be covered	Reference
	UNIT I		
1	Principles of Engineering Drawing – Various Drawing instruments and their	Introduction To Engineering Drawing:	T1,R1

	use (general exercises)		
2	Conventions in Drawing – Lettering – BIS	Drawing Instruments And Accessories, Types Of Line, Lettering Practice and Rules Of Dimensioning,	T-1, R-1
3-6	Geometrical Constructions	Geometrical Constructions, Basic Geometrical Shapes	T1,R1
7-9	Construction of various curves	Curves Used In Engineering Practice And Their Constructions	
	Construction of various curves, ellipse, parabola, hyperbola	Conic Sections, Construction Of Ellipse	T1,T2,R1
10-12		Parabola And Hyperbola	
13	Construction of various curves Cycloid,	Special Curves, Construction Of	T-1, R-1
13-16	Epicycloids, Hypocycloid And Involutes.	Cycloid, Epicycloids, Hypocycloid And	
	UNIT II		
	Construction of various scales for engineering use	Scales: Types Of Scales, Units Of Length And Their Conversion, plain	T1,T2,R1
17-20	Construction of various scales for engineering use	Construction Of Scales, Plain Scale, Diagonal Scale, Vernier Scale	T1,T2
		scale, Orthographic Projections, Conventions,	
21-22		Projection Of Points, First And Third Angle Projections,	T2, T1 T2, T1
	UNIT III		
23-28	Draw lines projection methods	Projection of lines, lines inclined to single plane, lines inclined to both the planes, true lengths and traces.	T2,R1
29-30	Draw planes projection methods	Projection Of Planes: Projection Of Regular Planes, Planes Inclined To One Plane,	T1,T2,R1
31-35	Draw planes projection methods	Projection Of Planes: Projection Of Regular Planes, Planes Inclined To Both Planes,	T1,T2,R1
	UNIT IV		
36-38	Draw solids projection methods	Projection Of Solids: Projections Of Regular Solid, Prisms, Cylinders,	T1,T2,R1

		Pyramids, Cones.Solids Inclined To One Plane	
39-43	Draw solids projection methods	Projection Of Solids: Projections Of Regular Solid, Prisms, Cylinders, Pyramids, Cones. Projection Of Solid	T1,T2,R1
44-48	Draw surfaces for solids	Development Of Surfaces:Development Of Lateral Surface Of Right Regular Solids, Prisms, Cylinders, Pyramids And Cones UNIT V	T2,R1
49-54	Draw isometric projections	Isometric Projections: Principle Of Isometric Projection, Isometric Scale, Isometric Projections And Isometric Views, Isometric Projections Of Planes, Prisms, Cylinders, Pyramids, And Cones.	T1,T2,R1
55-64	Draw transformation of projections	Transformation Of Projections: Conversion Of Isometric Views To Orthographic Views And Conversion Of Orthographic Views To Isometric Views	T2,R1

X. Mapping of course outcomes leading to the achievement of the program outcomes:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO.1	3	3	3	1	2	2	--	--	--	--	--	2
CO.2	3	3	3	1	2	2	--	--	--	--	--	2
CO.3	3	3	3	1	2	2	--	--	--	--	--	2
CO.4	2	3	3	--	2	2	--	--	--	--	--	2
CO.5	3	3	3	1	1	2	--	--	--	--	--	2
CO.6	3	3	3	1	2	2	--	--	--	--	--	2
CO	3	3	3	1	2	2	--	--	--	--	--	2

XI. Mapping of course outcomes leading to the achievement of the program specific outcomes:

CO	PO1	PO2	PO3	PO4
CO.1	2	3	--	--
CO.2	2	2	--	--
CO.3	2	3	--	--
CO.4	2	3	--	--
CO.5	2	3	--	--

CO.6	2	3	--	--
CO	2	3	--	--

1-Lightly Related

2-Medium Related

3-Highly related

Prepared By : K.Nirmala, Assoc Professor

HOD ME