Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Electrical and Electronics Engineering
BME 102 – ENGINEERING GRAPHICS
First Semester (odd Semester)

Course (catalog) description

To understand techniques of drawings in various fields of engineering

Compulsory/Elective course : Compulsory for all branch students

Credit & Contact hours : 3 and 45 hours

Course Coordinator : Mr.Saravana Kumar

Instructors : Mr.Saravana Kumar

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Mr. Saravana Kumar	First Year ECE	First Year ECE	**04422290125**	askumarwins@gmail.com	**1.30 p.m – 3.10 p.m**

Relationship to other courses:

Pre –requisites **:** +2 Level Maths & Physics

Assumed knowledge : Basic drawing instruments usage knowledge

Syllabus Contents

UNIT 1 ABSIC CURVES, PROJECTION OF POINTS AND STRAIGHT LINES 6+6 hours

Conics-construction of ellipse, parabola and hyperbola by eccentricity method-construction of cycloids-construction of involutes of square and circle-Drawing of tangent and normal to the above curves-Scales-Basic drawing conventions and standards-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.

UNIT II PROJECTIONS OF PLANES AND SOLIDS 6+6 hours

Projection of planes (Polygonal and circular surfaces) inclined to both the principal planes. Projection of simple solids like prisms, pyramids, cylinder, cone, tetrahedron and truncated solids when the axis is inclined to one of the principal planes/ both principal planes by rotating object method and auxiliary plane method.

UNITIII ORTHOGRAPHIC PROJECTIONS, ISOMETRIC PROJECTIONS & FREEHANDSKETCHING **6+6 hours**

Orthographic projection of Simple parts from 3D diagram-Principles of isometric projection and isometric view-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 Free hand sketching of orthographic & Isometric projection

UNITIV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES **6+6 hours**

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. 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.

UNIT V PERSPECTIVE PROJECTION, BUILDING DRAWING AND COMPUTER AIDED DRAFTING **6+6 hours**

Perspective projection of simple solids-Prisms, Pyramids and cylinders by visual ray method. Introduction-components of simple residential or office building-specifications-plan and elevation of different types of Residential buildings and office buildings. Introduction to drafting packages and basic commands used in AUTO CAD. Demonstration of drafting packages.

Total: 60 HOURS

TEXT BOOKS:

T1. N.D.Bhatt and V.M.Panchal, "Engineering Drawing", Charotar Publishing House, 50th Edition, 2010.
T2. K.V.Natarajan "A Text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.

REFERENCES:

R1. K.R.Gopalakrishna, "Engineering drawing",(Vol-I & II combined) Subhas stores, Bangalore,2007.
R2. K.Venugopal and V. Prabhu Raja, "Engineering Graphics", New Age International Private limited,2008.
R3. Luzzader, Warren.J., and Duff, John.M.,, "Fundamentals of Engineering Drawing with an introduction to Interactive computer graphics for design and production", Eastern Economy Edition, Prentice Hall of India Pvt Ltd, New Delhi,2005.

Computer usage: Exposure to AutoCAD (5 hours)

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	100%
Professional subject	-	0%

Broad area: Technical drawing

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	August 1st week	Session 1 to 24	2 Periods
2	Cycle Test-2	September 2nd week	Session 25 to 48	2 Periods
3	Model Test	October4th week	Session 1 to 60	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

To understand techniques of drawings in various fields of engineering and develop skill to produce accurate drawings	Correlates to program outcome		
	H	**M**	**L**
1. To know about different types of lines & use of different types of pencils in an Engineering Drawing	a,l		
2. To know how to represents letters & numbers in drawing sheet	b	a,l	
3. To know about different types of projection		l	c
4. To know projection of points ,straight lines, solids etc	h,i		f,l
5. To know development of different types of surfaces.	i		c,l
6. To know about isometric projection	j		c,l

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

S.NO	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT 1 ABSIC CURVES, PROJECTION OF POINTS AND STRAIGHT LINES			
1.	Introduction	No	T1/T2 Chapter 1 R1
2.	Conics – Construction of ellipse by eccentricity method	Yes	
3.	Construction - parabola and hyperbola by eccentricity method	Yes	
4.	construction of cycloids	Yes	
5.	construction of involutes of square and circle	Yes	
6.	Drawing of tangent and normal to conics and involutes	Yes	
7.	Scales-Basic drawing conventions and standards	No	
8.	Orthographic projection principles- Principal planes	No	
9.	First angle projection- Projection of points.	Yes	
10.	Projection of straight lines inclined to both the principal planes	Yes	
11.	Determination of true lengths and true inclinations by rotating line method	Yes	
12.	Trapezoidal method and traces.	Yes	
UNIT II PROJECTIONS OF PLANES AND SOLIDS			
13.	Projection of planes - introduction	No	T1, T2 Chapter 2 R2
14.	Inclined to both the principal planes.	Yes	
15.	Inclined to both the principal planes.	Yes	
16.	Projection of prisms	Yes	
17.	Problems on Prisms	Yes	
18.	Projection of pyramids	Yes	
19.	Projection of pyramids	Yes	
20.	Projection of cylinder	Yes	
21.	Projection of cone	Yes	
22.	Projection of cone	Yes	
23.	Projection of tetrahedron and truncated solids	Yes	
24.	Projection of tetrahedron and truncated solids	Yes	
UNITIII ORTHOGRAPHIC PROJECTIONS, ISOMETRIC PROJECTIONS & FREEHANDSKETCHING			
25.	Introduction to Orthographic projection	No	T1, T2 Chapter 3 R1
26.	Orthographic projection of Simple parts from 3D diagram	Yes	
27.	Principles of isometric projection and isometric view	No	
28.	Isometric scale- Isometric projections of simple solids and truncated solids	Yes	
29.	Isometric projection of Prisms	Yes	
30.	Prisms and pyramids	Yes	
31.	Isometric projection of Pyramids	Yes	
32.	Isometric projection of cylinders	Yes	

33.	Isometric projection of cones	Yes	
34.	Isometric view of combination of two solid objects in simple vertical positions	Yes	
35.	Free hand sketching of orthographic	Yes	
36.	Free hand sketching of Isometric projection	Yes	
UNITIV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES			
37.	Introduction to section of solids - Sectioning of solids in simple vertical position	No	T1, T2 Chapter 4 R1
38.	Sectioning of Prisms	Yes	
39.	Sectioning of Prisms, Pyramids	Yes	
40.	Sectioning of Cylinders and Cones	Yes	
41.	Section of solids - Cones	Yes	
42.	Obtaining true shape of section	Yes	
43.	Development of lateral surfaces of simple and sectioned solids	No	
44.	Development of sectioned Prisms	Yes	
45.	Development of sectioned Pyramids	Yes	
46.	Development of sectioned cylinders and cones	Yes	
47.	Development of lateral surfaces of solids with cut-outs and holes.	Yes	
48.	Problems on development of solids with holes	Yes	
UNIT V PERSPECTIVE PROJECTION, BUILDING DRAWING AND COMPUTER AIDED DRAFTING			
49.	Perspective projection of simple solids	No	T1 Chapter 5 R2 R3
50.	Perspective view of Prisms	Yes	
51.	Perspective view of Pyramids	Yes	
52.	Problems on perspective projection of pyramids	Yes	
53.	Perspective drawing of cylinders by visual ray method	Yes	
54.	Introduction- components of simple residential or office building-specifications	No	
55.	Plan and elevation of different types of Residential buildings and office buildings.	No	
56.	Building drawing problems residential	Yes	
57.	Building drawing problems office buildings	Yes	
58.	Introduction to AUTO CAD	No	
59.	Basic commands used in AUTO CAD	Yes	
60	Simple drafting in AutoCAD	Yes	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and technical skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	10%
Assignment	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by: Mr.Saravana Kumar Dated:

Addendum

ABET Outcomes expected of graduates of B.Tech / EEE / program by the time that they graduate:

a) An ability to apply knowledge of mathematics, science, and engineering fundamentals.
b) An ability to identify, formulate, and solve engineering problems.
c) An ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
d) An ability to design and conduct experiments, as well as to analyze and interpret data.
e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
f) An ability to apply reasoning informed by the knowledge of contemporary issues.
g) An ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
h) An ability to understand professional and ethical responsibility and apply them in engineering practices.
i) An ability to function on multidisciplinary teams.
j) An ability to communicate effectively with the engineering community and with society at large.
k) An ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
l) An ability to recognize the need for, and an ability to engage in life-long learning.

Program Educational Objectives

PEO1: PREPARATION
Electrical Engineering Graduates are in position with the knowledge of Basic Sciences in general and Electrical Engineering in particular so as to impart the necessary skill to analyze and synthesize electrical circuits, algorithms and complex apparatus.

PEO2: CORE COMPETENCE
Electrical Engineering Graduates have competence to provide technical knowledge, skill and also to identify, comprehend and solve problems in industry, research and academics related to power, information and electronics hardware.

PEO3: PROFESSIONALISM
Electrical Engineering Graduates are successfully work in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative acumen so as to be able to handle critical situations and meet deadlines.

PEO4: SKILL

Electrical Engineering Graduates have better opportunity to become a future researchers/ scientists with good communication skills so that they may be both good team-members and leaders with innovative ideas for a sustainable development.

PEO5: ETHICS

Electrical Engineering Graduates are framed to improve their technical and intellectual capabilities through life-long learning process with ethical feeling so as to become good teachers, either in a class or to juniors in industry.

Course Teacher	Signature
Mr. Saravana Kumar	

Course Coordinator **HOD/EEE**

(Mr. Saravana Kumar) ( )