

BMEE102P	Engineering Design Visualization Lab	L	T	P	C
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Pre-requisite	Nil	Syllabus version			
		1.0			
Course Objectives					
<p>1. Understand the importance of basic concepts and principles of engineering drawing for representing engineering components, sections, views by graphical representation using CAD.</p> <p>2. Enable the students with various concepts like dimensioning, conventions and standards related to working drawings in order to become professionally efficient.</p> <p>3. Develop the ability to communicate with others through the language of technical drawing and sketching.</p> <p>4. Apply the standards for the use of international and traditional units for technical drawing.</p>					
Course Outcome					
<p>Upon completion of this subject, the student will be able to</p> <p>1. Apply BIS and ISO standards in engineering drawing.</p> <p>2. Graphically construct two dimensional drawing for engineering applications.</p> <p>3. Draw projections of point, lines, solids, sections of solids for regular polyhedrons and solids of revolutions using computer aided drawing.</p> <p>4. Visualize geometrical solids in 3D space through orthographic and isometric projections.</p>					
Module:1	Introduction to Engineering Drawing	8 hours			
Introduction to Engineering Drawing, Drawing instruments, Drawing standards (BIS), Lettering in engineering, Sheet layout, elements of dimensioning - systems of dimensioning.					
Module:2	Free Hand Sketching	8 hours			
Free hand sketching- Pictorial representation of engineering objects – representation of three dimensional objects in two dimensional media – need for multiple views – developing visualization skills through free hand sketching of three dimensional objects.					
Module:3	Orthographic Projection	8 hours			
Introduction to projections: General principles of orthographic projection – first angle projection – layout of views - Projection of Points, Projection of lines. 2D drawing using CAD.					
Module:4	3D modelling and Projections	12 hours			
<p>Projection of Solids: Classification of solids, Projection of solids in simple position-Solid Modelling.</p> <p>Sections of Solids: Right regular solids and auxiliary views for the true shape of the sections.</p> <p>Development of Surfaces, Intersection of Solids: Intersection of two solids.</p>					
Module:5	Isometric Projection and Perspective Projection	8 hours			
<p>Isometric View/Projection: Isometric scales, Isometric projections of simple and combination of solids. Conversion of pictorial view into orthographic Projection- 2D drawing from 3D drawing – Missing views.</p> <p>Perspective Projection: Orthographic representation of a perspective views.</p>					
Module:6	Orthographic Projection into Isometric view	8 hours			
Conversion of Orthographic projection into isometric view- 3D modelling from 2D drawing.					
Module:7	Project on Product Development	8 hours			
Project on a product development related to any engineering application.					
Total Lecture hours					60 hours
Text Book					
1.	Venugopal K and Prabhu Raja V, Engineering Graphics, New AGE International Publishers, 2018.				
Reference Books					
1.	Bhatt N. D., Engineering Drawing, Charotar Publishing House Pvt. Ltd, 2019.				
2.	Randy H. Shih, SOLIDWORKS 2021 and Engineering Graphics - An Integrated Approach, SDC Publications, 2021.				

3.	Dennis K. Lieu, Sheryl A. Sorby, Visualization, Modeling, and Graphics for Engineering Design, Delmar, Cengage Learning, 2009.		
4.	Natarajan.K.V,A Textbook of Engineering Graphics, Dhanalakshmi Publishers, Chennai, 2015.		
Indicative Experiments			
1	Free Hand Sketching		
2	2D drafting using CAD software		
3	Dimensioning of 2D figures		
4	Projection of points and lines -2D drafting		
5	Projection of solids in simple position- 3D modelling		
6	Section of solids- 3D modelling		
7	Conversion of pictorial drawing into orthographic projection-CAD		
8	Conversion of orthographic projection into isometric view-CAD		
9	Engineering design and visualization of an engineering product -I		
10	Engineering design and visualization of an engineering product -II		
Total Laboratory Hours			60 hours
Mode of Evaluation: Examination and evaluation is done for CAD exercises. Continuous assessments in terms of CAD exercises, models / products designed and created; FAT & Oral examination			
Recommended by Board of Studies		02.07.2021	
Approved by Academic Council		No. 63	Date 23.09.2021