MEC135:BASICS OF MECHANICAL ENGINEERING

L:2 T:1 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: understand the fundamentals of engineering drawing including usages of drawing tools, line-types, dimensioning, letter-writing, scales and other conventions.

CO2 :: recognize and apply the conceptual framework of orthographic projections and acquire visualization and drawing skills on both grid-sheets and software.

CO3 :: understand the usages of sectioning and to draw sectioned views on both grid-sheets and software.

CO4 :: learn the procedures to draw the isometric views of few commonly used objects on both grid sheets and software.

CO5 :: explore the conceptual knowledge of digital fabrication using RPT and its fundamentals.

Unit I

Fundamentals of Engineering Drawing : Principles of engineering drawing and its importance, drawing instruments, line-types with applications, dimensioning, single stroke vertical Gothic letter writing, BIS norms

Unit II

Orthographic Projections : Introduction, principles, orthographic projections in first angle and third angle projections systems, practice, introduction to AutoCAD environment

Unit III

Sectional Views : Introduction, principle, importance, types- full section, offset section, half section, practice, 2D drawings on AutoCAD

Unit IV

Isometric Projections : Introduction, principles, terminology, isometric scale, isometric drawings and projections of stepped, inclined, oblique, and cylindrical blocks, isometric dimensioning, practice, 3D modelling on AutoCAD

Unit V

Introduction to Digital Fabrication : Need of digital manufacturing, prototype, types and roles of prototypes, rapid prototyping (RPT), phases of RPT, fundamentals of RPT, advantages, practice of 2D and 3D modelling on AutoCAD

Unit VI

Rapid Prototyping : Classification of RPT systems, process chain, 3D modelling, data conversion, checking-building- postprocessing, Stereolithography (STL)-process, principle, CAD for RPT, creation of STL file from 3D solid models

Text Books:

1. ENGINEERING DRAWING WITH AN INTRODUCTION TO AUTOCAD by DHANANJAY JOLHE, MC GRAW HILL

2. RAPID PROTOTYPING- PRINCIPLES AND APPLICATIONS by CHUA, C.K., LEONG, K.F., LIM, C.K., WORLD SCIENTIFIC

References:

1. ENGINEERING GRAPHICS FOR DEGREE by K.C. JOHN, PRENTICE HALL

2. ENGINEERING DRAWING by N. D. BHATT, CHAROTAR PUBLISHING HOUSE PVT. LTD.

3. MANUFACTURING ENGINEERING AND TECHNOLOGY by SEROPE KALPAKJIAN, ADDISON-WESLEY