INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

1. **Name of the Academic Unit: Engineering Drawing and Visualization**

2. **Subject Name: Engineering Drawing and Visualization; L-T-P: 1-0-3; Credits: 3**

3. **Pre-requisites: NIL**

4. **Syllabus and reference books:**

Syllabus:

1. Instruments used in manual drawing and software packages in “Computer Aided Drawing”; drawing sheet: sizes, margins, title blocks.
2. Scales: types and their representation; Lettering: types and sizes; Dimensioning: Arrow types, sizes, extension and offset distances; Lines: types and their applications; Conventions for representing different materials in drawing; Examples on dimensioning simple geometric figures.
3. Geometric constructions in manual drawing; Drawing parallel and perpendicular straight lines, lines at an inclination, arcs, circles, and ellipses; Orthographic projection of points and lines; Traces of lines; Projections of planes; Traces of planes.
4. Projections of regular solids: cubes, prisms, cylinders, cones, pyramids, tetrahedron.
5. Sections of solids having regular geometric shapes: cubes, prisms, cylinders, cones, pyramids, tetrahedron, spheres.
6. Orthographic projection of solids.
7. Isometric Projections (1): Isometric scale; Construction of isometric scale; Isometric views of planes.
8. Isometric Projections (2): Isometric views of solids, such as prisms, cylinders, cones and pyramids, and frustums.
9. Sections of solids having regular geometric shapes: cubes, prisms, cylinders, cones, pyramids, tetrahedron, spheres.
10. Building drawing: Components of buildings - Plan, elevation and sections of buildings.
11. Creating three dimensional objects in CAD software (1).
12. Creating three dimensional objects in CAD software (2).
13. Extracting section drawings from three dimensional CAD models, dimensioning and placement of the orthographic-projection drawings.
14. Visualization of simple two-dimensional surfaces (such as ground elevation terrain map) and three dimensional objects (cubes, cones, cylinders and pyramids) using the Python coding platform.

Reference Books:

1) N. D. Bhatt (2012). Engineering Drawing, Charotar Publishing House
2) R. K. Dhawan (2019). A Textbook of Engineering Drawing. S. Chand Publishing.
3) J. D. Bethune (2019). Engineering Design and Graphics with SolidWorks 2019. Macromedia Press.
4) B. J. Korites (2018). Python Graphics: A Reference for Creating 2D and 3D Images. Apress.