Course Syllabi: UTA008: Engineering Design-I (L : T : P :: 2 : 4 : 0)

1. **Course number and name**: UTA008; Engineering Design-I

2. **Credits and contact hours**: 4.0 and 6

3. **Text book, title, author, and year**

   Text Books / Reference Books
   - *Jolhe, D.A., Engineering Drawing, Tata McGraw Hill, 2008*
     Davies, B. L., Yarwood, A., Engineering Drawing and Computer Graphics, Van Nostrand Reinhold *(UK), 1986*
   - *Gill, P.S., Geometrical Drawings, S.K. Kataria & Sons, Delhi (2008).*
   - *Gill, P.S., Machine Drawings, S.K. Kataria & Sons, Delhi (2013).*
   - *Mohan, K.R., Engineering Graphics, Dhanpat Rai Publishing Company (P) Ltd, Delhi (2002).*
   - *French, T. E., Vierck, C. J. and Foster, R. J., Fundamental of Engineering Drawing & Graphics Technology, McGraw Hill Book Company, New Delhi (1986).*
     Rowan, J. and Sidwell , E. H., Graphics for Engineers, Edward Arnold, London (1968).

   a. Other supplemental materials
      - Nil

4. **Specific course information**
   a. Brief description of the content of the course (catalog description)
      ### *Engineering Drawing*
      1. Introduction
      2. Orthographic Projection: First angle and third angle projection system
      3. Isometric Projections
      4. Auxiliary Projections
      5. Perspective Projections
      6. Introduction to Mechanical Drawing
      7. Sketching Engineering Objects
      8. Sections, Dimensions and Tolerances

      ### *AutoCAD*
      1. Management of screen menus commands
      2. Introduction to drawing entities
      3. Co-ordinate systems: Cartesian, polar and relative coordinates
      4. Drawing limits, units of measurement and scale
      5. Layering: organizing and maintaining the integrity of drawings
      6. Design of prototype drawings as templates.
      7. Editing/modifying drawing entities: selection of objects, object snap modes, editing commands,
      8. Dimensioning: use of annotations, dimension types, properties and placement, adding text to drawing

      ### Micro Projects /Assignments:
      1. Completing the views - Identification and drawing of missing lines in the projection of objects

2. Missing Views – using two views to draw the projection of the object in the third view, primarily restricting to Elevation, Plan and Profile views
3. Projects related to orthographic and isometric projections
    a. Using wax blocks or soap bars to develop three dimensional object from given orthographic projections
    b. Using wax blocks or soap bars to develop three dimensional object, section it and color the section
    c. Use of AUTOCAD as a complementary tool for drawing the projections of the objects created in (1) and (2).
4. Develop the lateral surface of different objects involving individual or a combination of solids like Prism, Cone, Pyramid, Cylinder, Sphere etc.
5. To draw the detailed and assembly drawings of simple engineering objects/systems with due sectioning (where ever required) along with bill of materials.
    e.g. Rivet joints, simple bearing, wooden joints, Two plates connected with nut and bolt etc.

5. Specific goals for the course
After the completion of the course, the students will be able to:
- Creatively comprehend geometrical details of common engineering objects.
- Draw dimensioned orthographic and isometric projections of simple engineering objects.
- Interpret the meaning and intent of toleranced dimensions and geometric tolerance symbolism.
- Create the engineering drawings for simple engineering objects using autocad.
- Manage screen menus and commands using autocad.
- Operate data entry modes and define drawings geometrically in terms of cartesian, polar and relative coordinates in autocad.
- Create and edit drawings making selections of objects, discriminating by layering and using entities, object snap modes, editing commands, angles and displacements using autocad.

6. Brief list of topics to be covered
- Orthographic Projection: First angle and third angle projection system
- Isometric Projections
- Auxiliary Projections
- Perspective Projections