GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - MECHANICAL ENGINEERING
SEMESTER: III

Subject Name: **Machine Design and Industrial Drafting**

PART A

Sr. No.	Course Content
1.	**Design Consideration of Machine Parts:** Definition and understanding of various types of design, Morphology of design, Design procedure, Selection of materials, Properties and I.S.coding of various materials, factors of safety, Stress Concentration and methods of relieving stresses, Types of tresses-tensile, compressive, shear, bending, bearing, crushing, Eccentric axial stresses, principle stress, Residual stresses.
2.	**Design of Fasteners:** a. **Design of Riveted Joints:** Types of riveted joints, design of double and triple riveted butt joints with equal and unequal cover plates, Design of Circumferential joint, Longitudinal Butt Joint, Eccentric loading. b. **Welded Joints:** Types of welded joints, stresses in welded joints, Design for various loading conditions in torsion, shear, or direct load, eccentrically loaded welded joints, welding symbols. c. **Miscellaneous Joints:** Design of Gibb and cotter, and knuckle joint, Design of Spigot and socket Joint, Design of Turn buckle.
3.	**Design of Shaft:** Design of solid and hollow shaft for transmission of torque, bending moment and axial forces, Design of shaft for critical speed, design of shaft for rigidity and stiffness, flexible shafts.
4.	**Keys and Couplings:** Design of different types of keys, design of a muff and clamp coupling, Rigid coupling, Flange Coupling, Flexible coupling- Oldham, universal coupling.
5.	**Power Screws:** Types of power screw threads, design of screw with different types of threads used in practice, Design of nuts, Design of C clamp, Screw jack, toggle jack, design of coupler.
6.	**Levers:** General Procedure for design of levers, design of lever for safety valve, design of bell crank lever, design of rocker arm for exhaust valves.

PART- B (Industrial Drafting)

Sr. No.	Course Content
1.	**Assembly Drawings:** Drawings of assembled view for the part drawings of the following using propionate dimensions. a. **Engine Parts:** cylinder, liners, piston, connecting rod, crank shaft, stuffing boxes, cross heads, Eccentrics. b. **Machine Parts:** Screws jacks, Machine Vices, Plummer block, Tailstock. c. **Valves:** Steam stop valve, spring loaded safety valve, feed check valve and air cock.
2.	**Production Drawing:** Elements of production drawing, Fits and tolerance, allocation of fits for various mating parts, tolerance data sheet, and tolerance table preparation Geometric tolerance.
3.	**Surface Roughness:** Roughness and Machining symbols, indication on drawings.

PART- C (AutoCAD)

Sr. No.	Course Content
1.	**Introduction to Auto CAD:** Starting with AutoCAD, AutoCAD dialog boxes, Co-ordinate Systems, drawing lines, circle, arcs, rectangle, ellipse, polygons, etc.
2.	**Editing Sketched Objects:** Editing sketches, moving, copying, pasting, offsetting, scaling, chamfering, trimming, mirroring. Filleting, sketched objects.
3.	**Basic Dimensioning:** Geometric dimensioning and Tolerance: Dimensioning AutoCAD, Creating linear, rotated, angular aligned base line Dimensions, Modifying dimensions.
4.	Creating and modifying 3D objects using AutoCAD.
5.	Plotting the drawings in AutoCAD, plotting drawing using the plot dialog box, adding plotters and using plot styles, plotting sheets.

Reference Books:

1. P.C Sharma and D. K. Aggarwal “Machine Design”, S.K. Kataria & Sons 2009.
2. V. B. Bhandari “Design of Machine Elements”, Tata McGraw Hill PublishingCo.
3. S. G. Kulkarni, “Machine Design, Solved Problems", Tata McGraw Hill Publishing Company Ltd., New Delhi.
4. William Orthein, "Machine Component Design (Vol. I & II)", M/s. Jaico Publishing.
5. N.D. Bhatt, “Machine Drawing” , Charator Publication.
6. P.S. Gill, Machine Drawing by S. K. Kataria & Sons New Delhi.
7. Joseph Edward Shigley and Charles R. Mischke, "Mechanical Engineering Design", McGraw Hill International Edition.
8. Sham Tickoo, AutoCAD 2009 CENGAGE learning Indian Edition.
9. P.J Shah, “Machine Drawing”, S. Chand Publication.
10. Machine Design by Shigley Tata McGraw hill.