GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. SEMESTER: V
MARINE ENGINEERING

Subject Name: **Elementary Design and Drawing**
Subject Code: **151805**

Teaching Scheme				Evaluation Scheme		
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (Theory) (E)**	**Mid Sem Exam (Theory) (M)**	**Practical (I)**
3	0	2	5	70	30	50

Sr. No.	**Course Content**
1.	**Procedure in Machine Design:** Concepts of design, procedure & processes, Design synthesis, Economic consideration in design, Feasibility, Preliminary design alternative, Final design alternative, Preliminary and Final plans and drawings. Use of standards in design, selection of preferred sizes, Common useful materials and manufacturing considerations in design. Properties of materials, heat treatment processes, BIS system of designation of steels. Review of failure criteria in mechanical design, Basis of good design Failure of machine parts, deformation, wear corrosion.
2.	**Machine Design:** Strength consideration for design, strength of materials, reliability, influence of size, stress concentration, strength under combined stresses, static loads, impact loads, repeated loads, completely reversed loads, static plus alternating loads, cyclic and combined loads, fatigue strengths, dynamic stresses, selection of materials.
3.	**Specifications: Fit, Tolerance, Finish – BIS:** Design & drawing to specifications for parts subjected to direct loads. Fasteners, bolts and screws, cotter & knuckle joints, keys & couplings, pipe joints, riveted & welded joints. Design of welded machine parts. Power transmission: Shafts and axles, bearings, clutches & brakes, belt drives, design & drawing of tooth gearing like spur & bevel gears, rack & pinion, worm & worm wheels, helical gears etc.
4.	**Marine Engineering Drawing:** Advanced marine machinery assembly drawing: a. 4 – stroke piston & rod b. Hydraulic steering gear c. Stern tube and tailshaft

	d. High lift safety valve e. Full bore safety valve f. Plate type gauge glassg g. Turbine flexible coupling h Flow regulator i. Air inlet valve j. Fuel valve k. Quick closing valve

Reference Books:

1. Machine Design By M.F. Spotts , P.Sadhu, Terry Shoup and L.E.Hornberge, Tata McGraw Hill
2. Machine Design By V.B.Bhandari, Tata McGraw Hill
3. Fundamentals of Machine Component Design by Juvinall Markshek, Wiley India
4. Machine design an integrated approach by Robert Nortan, Pearson Publisher
5. Machine Drawing by Ajeet Singh,, Tata McGraw Hill