

Course No:MSD 301

DESIGN OF TRIBOSYSTEMS

C L P(4 3 2)

Course topics:

UNIT I

Application of system concepts to tribology, Function of Tribomechanical systems, Structure of Tribo-mechanical systems, Tribological interaction, Functional plane, mechanical work plane, thermal plane and material plane. Role of tribo processes in mechanical systems, Wear as a system property. Contact Mechanics, number of bodies taking part in contact process, macro geometry of bodies, Deformation mode; elastic , plastic and elastic-plastic, Types of relative motion; static contact, rolling contact, sliding contact, contact physics and geometry,contamination layer, absorbed gas layer, oxide layer, work hardened layer, metal substrate.

UNIT II

Materials for various tribo-components, materials for plane bearing, materials for gear, materials for brakes, clutches, materials for Internal combustion engines, ceramics and special alloys, cermets, polymer materials, selection considerations in design.

UNIT III

Design of various tribo-elements; such as: Plane bearing, Gear, Seals, Piston and cylinder, Friction devices, cutting tools, chains. Design of lubrication systems.

Text Book:

1. Czichos, H., "Tribology: A system approach to the science & technology of friction, lubrication and wear,"– Tribology Series 1, Elsevier Scientific Publishing Company, Amsterdam, Netherland, 1978.

Reference Books:

1. Peterson, M. B., Winer, W. O., "Wear Control Handbook," ASME, N. Y., 1992.
2. Glaeser, W. A., "Tribology: Materials for Tribology," –Tribology series – Vol. 20, Elsevier,N. Y. 1992.
1. Stolarski, T., "Tribology in Machine Design", Butterworth-Heinemann, N. Y., 1990.