Tribology - Web course

COURSE OUTLINE

Tribology deals with design of fluid containment systems like seals and gasket, Lubrication of surfaces in relative motion to achieve reduced friction and wear. The structure of the bearing and the nature of fluid flow determine the loads that can be supported. Modeling systems as hydrostatic squeeze film and Elasto-hydrodynamic lubrication will be studied as infinite and later finite structures. Gas (air) lubricated and rolling contact type motions with deformation at contact will be studied as special systems.

COURSE DETAIL

Sl. No	Topic
1	**Introduction** 1. Introduction to tribology 2. History of tribology 3. Interdisciplinary Approach 4. Economic Benefits.
2	**Friction** 1. Causes of Friction. 2. Adhesion Theory. 3. Abrasive Theory. 4. Junction Growth Theory. 5. Laws of Rolling Friction. 6. Friction Instability.
3	**Wear** 1. Wear Mechanisms. 2. Adhesive Wear. 3. Abrasive Wear. 4. Corrosive Wear. 5. Fretting Wear.

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Mechanical Engineering

Pre-requisites:

- Fluid mechanics

Coordinators:

Dr. Harish Hirani
Department of Mechanical Engineering IIT Delhi

	6. Wear Analysis
4	**Lubrication and Lubricants** 1. Importance of Lubrication. 2. Boundary Lubrication. 3. Mixed Lubrication. 4. Full Fluid Film Lubrication ; Hydrodynamic 5. Elastohydrodynamic lubrication. 6. Types & Properties of Lubricants. 7. Lubricants Additives.
5	**Fluid film lubrication** 1. Fluid mechanics concepts. 2. Equation of Continuity & Motion. 3. Generalised Reynolds Equation with Compressible & Incompressible Lubricants.
6	**Application of Tribology** 1. Introduction 2. Rolling Contact Bearings. 3. Gears 4. Journal Bearings - Finite Bearings.

References:

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Third Edition, Elsevier Inc., 2005.
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