ME802 IC ENGINE TRIBOLOGY 3-0-0-3

Introduction-Introduction of tribology-Interdisciplinary Approach and Economic Benefits-Triblogical considerations in the designs of bearing, cam,gear, reciprocating components

Friction - Theories of friction, Sliding friction – Rolling friction characteristics of common metals and non-metals – friction under different environments. Engine friction – Losses and engine design parameters.

Wear-Types of wear and Wear Mechanisms- factors affecting wear, selection of materials for different wear situations, measurement of wear, tribometers and tribometry.Engine wear mechanisms, wear resistant materials and coatings and failure mode analysis.

Lubrication–Stribeck diagram,Boundary Lubrication- Lubrication Mechanisms - Hydrodynamic Lubrication - Lubricant Classifications - Solid and Semi Solid Lubricants - Liquid Lubricants-Lubricant Additives- Fluid Film Lubrication-Solution of Reynolds Equation -Hybrid Solution Approach(to solve Reynolds Equation) -Finite Difference Method to Solve Reynolds Equation - Finite Difference Method to Solve Reynolds Equation - Thermo Hydrodynamic Lubrication –Estimating Elastic Deformation

Lubricants: Type of lubricants, properties and testing, service, classification of lubricants, lubrication of tribological components, lubrication system, lubricant monitoring, SOAP, ferrography and other rapid testing methods for lubricants contamination.

Application of Tribology-Rolling Element Bearings Selection of Rolling Element Bearings - Friction of Rolling Element Bearing-Bearing Clearance –Bearing Lubrication –Tribology of Gears –Friction and Lubrication of Gears –Friction and Lubrication of Gears - Friction and Lubrication of Gears - Hydrostatic Bearings - Hydrodynamic Journal Bearings

TEXTBOOKS/REFERENCES:

1. ErnestRabinowiez, "*Friction & Wear of Material*", John Wiley & Sons, Newyork, 1995.

2. A. Cameron, "*Basic Lubrication Theory*", Ellis Horwood Ltd, 1981.

3. A. Cameron, "*The Principles of Lubrication*", Longmans Green & Co. Ltd, 1966.

4. Yokio Hori, "*Hydrodynamic Lubrication*", Springer, 2006.

5. H.Rahnejat, *"Tribology and Dynamics of Engine and Powertrain Fundamentals, Applications and Future Trends"*, Woodhead Publishing Limited", 2014.