

## **PEME5304 TRIBOLOGY**

### **MODULE- I**

**(12 hours)**

Study of various parameters: Viscosity, flow of fluids, viscosity and its variation -absolute and kinematic viscosity, temperature variation, viscosity index determination of viscosity, different viscometers used. Hydrostatic lubrication: Hydrostatic step bearing, application to pivoted pad thrust bearing and other applications, hydrostatic lifts, hydrostatic squeeze films and its application to journal bearing.

### **MODULE -II**

**(11 hours)**

Hydrodynamic theory of lubrication: Various theories of lubrication, petroffs equation, Reynold's equation in two dimensions -Effects of side leakage - Reynolds equation in three dimensions, Friction in sliding bearing, hydro dynamic theory applied to journal bearing, minimum oil film thickness, oil whip and whirl anti -friction bearing.

### **MODULE- III**

**(12 hours)**

Concept of gas lubricated bearing -Concept of Elastohydrodynamic lubrication -Friction and power losses in journal bearings: Calibration of friction loss friction in concentric bearings, bearing modulus, Sommerfield number, heat balance, practical consideration of journal bearing design considerations. Air lubricated bearing: Advantages and disadvantages application to Hydrodynamic journal bearings, hydrodynamic thrust bearings. Hydrostatic thrust bearings. Hydrostatic bearing Analysis including compressibility effect. Bearing materials: General requirements of bearing materials, types of bearing materials.

### **TEXT BOOKS:**

1. Fundamentals of Tribology, Basu, SenGupta and Ahuja/PHI
2. Tribology in Industry: Sushil Kumar Srivatsava, S. Chand &Co.

### **REFERENCE:**

1. Introduction to Tribology of Bearings – B.C. Majumdar, S. Chand & Co.
2. Tribology – Hutchins, Asterix Publishers(1992)
3. Tribology - Lambert M Surhone, Miriam T Timpledon, Susan F Marseken, Betascript Publishing(2010)