RKUNIVERSITY

SYLLABUS

Course Title	INDUSTRIAL TRIBOLOGY (ELECTIVE-I)
Course Code	MD915
Course Credit	Lecture : 04
	Practical : 01
	Tutorial : 00
	Total : 05

Course Objective

The objective of the course is to –

- Understand the nature of engineering surfaces, their topography and learn about surface characterization techniques.
- To learn about the consequences of wear, wear mechanism, wear theories and analysis of wear problems.
- To understand the fundamental principles of high contact stresses, elasto hydrodynamic lubrication in rolling bearings and gears.

Detailed Syllabus

Sr. No.	Name of chapter & Details	Hours Allotted
	SECTION – I	
1	Metrology of surfaces, nature of friction and wear processes	**10**
2	Materials for wear reduction and control; coatings for wear resistance	**08**
3	Theory, testing and control of corrosion, Lubricants and bearing materials	**10**
	Total	**28**
	SECTION – II	
4	Hydrodynamic lubrication, Steady state and dynamically loaded bearing design	**10**
5	Elasto hydrodynamic lubrication, rolling element bearing and gear lubrications, Hydrostatic lubrication	**08**
6	Lubrication problems at certain extreme environmental conditions e.g. pressure, temperature and vacuum, Analysis and design of variable speed drive elements.	**10**
	Total	**28**

Instructional Method and Pedagogy:

- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
- Surprise tests/Quizzes/Seminar/Tutorials will be conducted.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.

Students Learning Outcomes:

At the end of the course the students will be able to understand:

- Apply basic material property information to the study of friction, wear and lubrication.
- Differentiate and identify the different types of sliding and rolling friction, types of wear due to sliding and rolling and their respective theories.
- Specify and interpret the results of the diagnosis of tribological problems.

Reference Books:

1. Fundamentals of Tribology by N.P. Suh and N. Saka - MIT Press
2. Friction Wear Lubrication: Tribology Handbook Vol. I, II and III by I.V. Kragelsky and V.V. Alisin - MIR Publishers
3. Theory & Practice of Lubrication for Engineers by D.D. Fuller - John Wiley

Additional Resources

- www.nptel.iitm.ac.in