



FIRST SEMESTER, 2016-2017

COURSE HANDOUT (PART-II)

Date: 02/08/2016

In addition to Part-I (General Handout for all courses appended to the time table), this portion gives further specific details regarding the course.

Course Code: DE G513

Name of the Course: Tribology

Instructor-In-Charge: Sandeep Dhar (sandeep.dhar@pilani.bits-pilani.ac.in)

Scope and Objective of the Course:

The course aim at exposing a higher degree student with advanced concepts in the field of industrial tribology. One may expect to gain a basic understanding of tribology has evolved as an important aspect of modern equipments. Also, emphasis would be given on the mathematical modeling to develop analysis tools; this is to enable a student to appreciate the subtleties of using gained knowledge as design tool.

1. Textbooks

- TB1:** Basu, S. K; Ahuja, B. B., Sengupta, S. N., “Fundamentals of Tribology”, Prentice Hall of India 2005.
- TB2:** Class lecture notes

2. References

- RB1:** Stachowiak G.W.; Batchelor A.W.; “Engineering Tribology”; Elsevier, 1993.
- RB2:** Fuller D.D.; “Theory and Practice of Lubrication for Engineers”, John Wiley & Sons Inc. 1965.

3. Course Contents

Topic	Number of Lectures	Source
1. Introduction to Tribology a. Background and History of Tribology b. Elements of tribology c. Economic effect of friction and wear d. Lubricants and its properties	5 (1+1+1+2)	TB1: Ch-1 RB1: Ch-1,2
2. Hydrodynamic Lubrication a. Introduction b. Reynolds Equation and lubrication modeling c. Pad Bearings	14 (1+3+2+2+3+2+1)	TB1: Ch-2,4 & 5 RB1: Ch-4





Topic	Number of Lectures	Source
d. Converging-Diverging wedges e. Journal Bearings f. Thermal Effects and Cavitation in Bearings g. Limits of hydrodynamic Lubrication		RB2: Ch- 5&6
3. Hydrostatic Lubrication a. Introduction b. Hydrostatic Bearing Analysis c. Hydrostatic Bearing Design d. Aerostatic Bearings e. Stability analysis	8 (1+2+2+2+1)	TB1: Ch-7 RB1: Ch-6 RB2: Ch-3
4. Elastohydrodynamic Lubrication (EHL) a. Introduction b. Contact Stresses c. Elastohydrodynamic Lubrication Films d. Traction and EHL	9 (1+4+3+1)	TB1: Ch-8 RB 1:Ch-7
5. Friction, Wear and Surface Treatments	4	TB2
Total	40	

4. Evaluation Scheme and Schedule

Component	Weightage (%)	Date	Remarks
Mid Semester Exam	25	As per the exam schedule	3/10 8:00 - 9:30 AM
Assignment ^{\$}	15	TBD	Choice of research paper would involve a comprehensive presentation about the paper along with reproducing some results
Case study ⁺	20	TBD	Would be furnished by the course instructor
Comprehensive Examination	40	As per the exam schedule	1/12 AN

^{\$} Only after discussions and approval from the instructor-in-charge.

⁺ Group size would be decided depending on the class strength.





5. Chamber Consultation Hour:

Chamber: 2243-P Timings: Will be announced later

6. Notices concerning the course:

All notices concerning the course will be displayed on the **department notice board** and via **email**.

7. Make-up Policy:

- Only for Mid-Sem and End-Sem.
- Make up will be permitted only in cases with appropriate reasons and necessary proof related to the absence.

Academic Dishonesty: *Any form of plagiarism or related forms of academic dishonesty will invite severe penalty on grades. For more details of academic dishonesty, please visit:*

https://en.wikipedia.org/wiki/Academic_dishonesty

Instructor-In-Charge

DE G513

