ME 4193 Tribological Design (Elective)

Catalog Description: ME 4193 Tribological Design (3-0-3)
Prerequisites: COE 3001 Deformable Bodies and ME 3340 Fluids
Analysis of tribological aspects of machine components, including friction, lubrication and wear. Group design project to optimize system tribological performance.

Textbook: J. A. Williams, *Engineering Tribology*, Cambridge University Press, 2005.

Topics Covered:

1. Introduction
2. Surface topography
3. Hertzian contact
4. Friction
5. Wear
6. Hydrodynamic lubrication
7. Hydrostatic lubrication
8. Elasto-hydrodynamic lubrication
9. Boundary lubrication
10. Lubricants
11. Surface modification

Course Outcomes:

Outcome 1: To introduce students to the field of tribology.

1.1 Students will demonstrate basic understanding of friction, lubrication and wear processes.
1.2 Students will become familiar with mathematical tools used to analyze tribological processes.

Outcome 2: To enhance students' awareness of tribological issues in the design of machine components, such as rolling element bearings, journal bearings, thrust bearings, seals and braking systems.

2.1 Students will become familiar with common anti-friction and anti-wear components and the lubricants used therein.
2.2 Students will be able to describe the detailed operation of selected anti-friction or anti-wear components.
2.3 Students will be able to design a tribological system for optimal performance.
2.4 Students will be able to develop technical project reports and technical presentations.

Correlation between Course Outcomes and Program Educational Outcomes:

ME 4193												
	Mechanical Engineering Program Educational Outcomes											
Course Outcomes	a	b	c	d	e	f	g	h	i	j	k	l
Course Outcome 1.1	X				X					X	X	X
Course Outcome 1.2	X				X					X	X	X
Course Outcome 2.1	X				X					X	X	X
Course Outcome 2.2	X				X					X	X	X
Course Outcome 2.3	X	X			X	X				X	X	X
Course Outcome 2.4	X	X			X	X				X	X	X

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