

1.	Title of the course	Tribology and Surface Engineering
2.	Course number	ME5033
3.	Status of the course	Elective
4.	Structure of credits	3-0-2-4
5.	Offered to	UG
6.	New course/modification to	New course
7.	To be offered by	Department of Mechanical Engineering
8.	To take effect from	July 2020
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	Course Objective(s): To design solids from a topographical, structural, mechanical and energetic perspective. To characterize and analyse the basic phenomena of surfaces in relative motion. To design and control basic friction, wear, and lubrication processes at the sliding interface.	
12.	Course Content: Introduction and scope of tribology and surface engineering; An analysis of interactions between solid surfaces at the molecular and atomic level; Contact between macroscopic surfaces; Friction and lubrication; Sliding wear, abrasive wear and erosive wear; Surface engineering processing techniques: chemical modification of surfaces, mechanical modification of surfaces, deposition processes for coatings; Characterization of engineered surfaces; Experiments and case studies based on tribology and surface engineering.	
13.	Textbook(s): 1. Dearnley P A, <i>Introduction to Surface Engineering</i> , 1st Edition, Cambridge University Press (2017). 2. Hutchings I M and Shipway P, <i>Tribology: Friction, and Wear of Engineering Materials</i> , 2nd Edition, Elsevier Ltd (2017).	
14.	Reference(s): 1. Bhushan B, <i>Introduction to Tribology</i> , 2nd Edition, John Wiley & Sons, Ltd (2013). 2. Budinski K G, <i>Surface Engineering for Wear Resistances</i> , 1st Edition, Prentice Hall, Englewood Cliffs (1988). 3. Dwivedi D K, <i>Surface Engineering: Enhancing Life of Tribological Components</i> , 1st Edition, Springer (2018). 4. Reidenback F, <i>ASM Handbook: Surface Engineering</i> , 1st Edition, ASM-International, Metals Park, OH (1994).	