

		National Institute of Technology Meghalaya An Institute of National Importance											CURRICULUM						
Programme		Bachelor of Technology in Mechanical Engineering										Year of Regulation		2018					
Department		Mechanical Engineering										Semester		V					
Course Code		Course Name								Credit Structure				Marks Distribution					
										L	T	P	C	INT	MID	END	Total		
ME 321		Tribology								3	0	0	3	50	50	100	200		
Course Objectives		To understand basic principles of friction and tribology and able to classify various tribological properties of lubricants and their application. To develop the skills to analyze and design methods to analyse various lubricant properties and use them for the practical application.								Course Outcomes		CO1		To understand the properties of lubricant and select proper lubricant for a given application. (Understanding)					
												CO2		Determine tribological performance parameters of sliding contact in different lubrication regimes. (Applying)					
												CO3		Design and select appropriate bearings for a given application. (Applying)					
												CO4		Predict the type of wear and volume of wear in metallic and polymer surfaces. (Analyzing)					
		Mapping with Program Outcomes (POs)											Mapping with PSOs						
No.	COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3			
1	CO1	3	2	0	0	2	2	2	0	0	0	0	2	3	0	0			
2	CO2	3	2	0	0	2	2	2	0	0	0	0	2	3	2	0			
3	CO3	3	0	2	0	2	2	2	0	0	0	0	2	2	3	0			
4	CO4	2	0	2	2	2	2	2	0	0	0	0	2	2	3	0			
SYLLABUS																			
No.	Contents														Hours	COs			
I	Introduction Overview of the course, history and basic concept of friction, wear and Lubrication.														10	CO1			
II	Lubricants Types of lubricants, Objectives of lubricant, Physical properties of lubricants, Selection of lubricant.														09	CO2			
III	Modes of Lubrication Hydrodynamic, Hydrostatic, Elasto-hydrodynamic, mixed and boundary lubrication, Reynolds' equation, Applications of hydrodynamic lubrication theory - Journal bearing and Inclined thrust pad bearing, Hydrodynamic lubrication of roughened surfaces, Theories of Externally pressurized lubrication, Squeeze-film lubrication, Elasto-hydrodynamic lubrication and air lubricated bearing.														12	CO3			
IV	Friction and Wear Origin of sliding friction, Contact between two bodies in relative motion, Types of wear and their mechanisms - Adhesive wear, Abrasive wear, Wear due to surface fatigue and wear due to chemical reactions, wear of metallic materials, Tribology of polymers.														10	CO4			
Total Hours															41				
Essential Readings																			
1. Stachowiak, G.W., Batchelor, A.W., Engineering Tribology, 3rd Ed., Elsevier, 2010.																			
2. Majumdar B.C, Introduction to bearings, S. Chand & Co., Wheeler publishing, 1999.																			
Supplementary Readings																			
1. Andras Z. Szeri, Fluid film lubrication theory and design, Cambridge University press, 1998.																			