	National Institute of Technology Meghalaya An Institute of National Importance	**CURRICULUM**

Programme **Bac elor of Technology in Mechanical Engineering**		Year of Regulation **2018**	
Department **Me hanical Engineering**		Semester **IV**	

Course Code	Course Name	Credit Structure				Marks Distribution	
		L	T	P	C	Continuous Evaluation	Total
ME 252	**Theory of Machines Lab**	**0**	**1**	**2**	**2**	**100**	**100**

Course Objectives	To understand the basics knowledge of steering mechanism, governor, gyroscope, moment balance, cams and whirling of shaft	Course Outcomes	CO1	To understand the static and dynamic balancing, moment balance, dynamic friction. (Understanding)
			CO2	Understand the basic concepts of governor, gyroscope, and cams. (Understanding)
			CO 3	To verify Hooks law (applying)
	To perform the experiments using various setups to prove various principles of mechanics		CO4	To perform the whirling of shaft experiment and determining the critical speed in loaded condition (applying)

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1 **2**	**2**	**2**		**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**0**
2	CO2 **2**	**2**	**2**		**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**0**
3	CO3 **2**	**2**	**2**		**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**0**
4	CO4 **2**	**2**	**2**		**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**0**
5	CO5 **2**	**2**	**2**		**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**0**
6	CO6 **0**	**0**	**0**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

SYLLABUS

No.	Content	Hours	COs
1	To tudy the fundamentals of the equilibrium of moments and application of the law of levers	**03**	**CO1**
2	To verify the laws of statics (Force and Torque Balance)	**03**	**CO1**
3	To determine mass moment of inertia of a flywheel.	**03**	**CO1**
4	Demonstration of fundamental principles of belt drives, wheel and disc drives and investigation of transmission ratios on spur gear.	**03**	**CO1**
5	To balance the masses statically and dynamically of a single reciprocating/rotating mass system.	**03**	**CO1**
6	To demonstrate and measure displacement curves for cam mechanisms.	**03**	**CO2**
7	To study the characteristic curves of different centrifugal force governors.	**03**	**CO2**
8	Experimental verification of the laws of gyroscopes – gyroscopic couple	**03**	**CO2**
9	To verify Hook's law using parallel-coupled loaded/gimbal spring.	**03**	**CO3**
10	To study and conduct basic experiments on mechanical vibration, natural damped and forced vibrations (b) To understand the critical rotational speeds on simply loaded and continuous shafts – whirling of shaft	**03**	**CO4**
11	Mini Project	**06**	**CO1, CO2, CO3 and CO4**
	Total Hours	**36**	

Essential Readings

1 Joseph E. Shigley, "Theory of Machines and Mechanisms", Oxford University Press.
2 Thomas Bevan, "Theory of Machines", Pearson.

Supplementary Readings

1. Jagdish Lal, "Hydraulic Machines including Fluidics" , Metropolitan Book
2. Ghosh and Mallick, "Theory of Machines and Mechanisms", Ease-West Press.