



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

**CURRICULUM**

Programme	<b>Bachelor of Technology in Mechanical Engineering</b>				Year of Regulation				<b>2018</b>							
Department	<b>Mechanical Engineering</b>				Semester				<b>VI</b>							
Course Code	Course Name				Credit Structure				Marks Distribution							
					L	T	P	C	INT	MID	END	Total				
<b>ME302</b>	<b>Machine Design-II</b>				<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>50</b>	<b>50</b>	<b>100</b>	<b>200</b>				
Course Objectives	To develop an ability and skill to design various machine elements like clutches, brakes and flywheels				Course Outcomes	CO1	Illustrate knowledge on basic machine elements used in machine design (Understanding)									
	To teach rolling contact and journal bearing					CO2	Implementation of basic machine elements design to the design of clutches, brakes and flywheels (Applying)									
	To develop an ability and skill to design spur, helical, bevel and worm gears					CO3	Analyse the design of rolling contact and journal bearing (Analyzing)									
	To provide a general idea of mechanical systems design					CO4	Analyse the design of spur, helical, bevel and worm gears (Analyzing)									
					CO5	Evaluate the part design of mechanical systems using codes and standards (Evaluate)										
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	0	0	0	0	0	0	0	0	0	0	0	3	0	0
2	CO2	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0
3	CO3	0	0	3	0	0	0	0	0	0	0	0	0	3	0	0
4	CO4	0	0	3	0	0	0	0	0	0	0	0	0	3	1	0
5	CO5	0	0	3	0	0	0	0	0	0	0	0	0	3	1	0
6	CO6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**SYLLABUS**

No.	Content	Hours	COs
I	<b>Design of Clutches</b> Friction clutches, disc clutches – design for uniform pressure and wear, multi disc clutches, Cone clutch, Centrifugal clutch	<b>04</b>	<b>CO1 CO2</b>
II	<b>Design of Brakes</b> Shoe brakes –short and long shoe analysis, disc and drum brake design	<b>05</b>	<b>CO1 CO2</b>
III	<b>Design of Flywheels</b> Fly wheel – torque analysis, solid disc flywheel, stresses in flywheels, Design of flywheels	<b>03</b>	<b>CO1 CO2</b>
IV	<b>Design of Bearings</b> Hydrodynamic lubrication theory, Hydrostatic and Hydrodynamic bearings – Bearing Design and selection of parameters, Rolling Element Bearings – dynamic load carrying capacity, selection and design.	<b>08</b>	<b>CO1 CO3</b>
V	<b>Design of Gears</b> Gear Drives, Classifications, Selection of types of Gears, Law of Gearing; Spur Gears – terminology, force analysis, failure design of spur gear; Helical Gear – terminology, force analysis, design of helical gear; Bevel Gears – terminology, force analysis, design of bevel gear; Worm Gears – terminology, force analysis and design.	<b>12</b>	<b>CO1 CO4</b>
VI	<b>Systems Approach to Design</b> Decision Making, Simulation of mechanical systems using CAD tools, Sensitivity analysis of design parameters, Value Analysis and Value Addition to designed components and systems; Exercises of mechanical systems design with examples	<b>04</b>	<b>CO2 CO3 CO4 CO5</b>
<b>Total Hours</b>		<b>36</b>	

**Essential Readings**

1. J. E. Shigley, “Mechanical Engineering Design”, McGraw Hill.
2. V B Bhandari, “Design of Machine Elements”, Tata Mcgraw Hill.

**Supplementary Readings**

1. A. H. Burr and J. B. Cheatham, “Mechanical Analysis and Design”, Prentice Hall.
2. M.F Spotts, T.E Shoup, L.E. Hornberger, S.R Jayram, and C. V. Venkatesh, “Design of Machine Elements”, Person Education.
3. Faculty of Mechanical Engineering, PSG College of Technology, “Design Data Book ”.