ME322 Design of Mechanical Assemblies										
L	**T**	**P**	Credit	Area		**CWS**	**PRS**	**MTE**	**ETE**	**PRE**
3	0/1	2/0	4	DEC/GEC		15/25	25	20/25	40/50	-

Objective: To enable the students to understand the fundamentals of friction clutches, Lubrication, Bearings and mechanical drives. To understand stages in design of Gears, hoisting elements and design of engine parts.

Syllabus		**Contact Hours**
Unit-1	Design of Friction clutches, uniform wear, and uniform pressure assumptions, centrifugal clutches. Brakes: Design of internal expansion elements, assumptions, design of external contraction elements, Band brakes.	**5**
Unit-2	Bearings and Lubrication: Types of Lubrication, viscosity, journal bearing with perfect lubrication, hydrostatic and hydrodynamic lubrication theory, journal bearing design. Selection, and applications of rolling element bearings with axial and radial loads, bearing materials, bearing seals, mounting of bearings.	**6**
Unit-3	Mechanical drives: selection of transmission, Belt and Chain drives: Flat belts, V Belts, Roller chains.	8
Unit-4	Design of Gears: Helical, Bevel, and Worm gears, design stresses, stress concentration, overload factors, velocity factors, bending strength of gear tooth, Buckingham equation for dynamic loads, and wear characteristics, AGMA design equations, Design of an automobile gear box.	**7**
Unit-5	Hoisting elements: Theory of curved beams, Crane hooks, Snatch block assembly elements.	**8**
Unit-6	Design of Engine parts: Connecting rod, crank shaft, piston	**8**
	Total	**42**

Reference Book:	
1	Mechanical Engineering Design Shigley, J. E., Mischke, C. R. and Budynas, R. G., McGraw Hill, 7th Edition, ISBN- 0071077839, 2004.
2	Fundamental of Machine Component Design, Juvinall, R. C., and Marshek, K. M., John Wiley and Sons, ISBN- 0471448443, 2000.
3	Fundamentals of Machine Elements Hamrock, B. J., Jacobson, B. Schmidt, S. R. McGraw Hill, ISBN-9781482247480, 1999.
4	Machine Design: An Integrated Approach Norton, R. L., Pearson Education, ISBN- 9788131705339, 2001.
5	Machine Design, Bhandari TMH
6	Machine Design, D. K. Aggarwal and P. C. Sharma Dhanpat Rai, ISBN- 9789350142813.

Course Outcomes

CO1	To understand and apply principles of clutch design to spur gears and industrial spur gear boxes.
CO2	To become proficient in Design of Helical and Bevel Gear
CO3	To develop capability to analyze Rolling contact bearing and its selection from manufacturer's Catalogue.
CO4	To learn a skill to design Belt and Chain drives for various industrial applications.
CO5	Use of hoisting elements such as cranes, conveyors, fork lifters, etc
CO6	Design of Engine part namely Connecting rod, crank shaft, piston, etc

CO-PO/PSO Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	2	1	0	1	0	0	3	3	2	2
CO2	2	3	3	2	1	1	0	1	2	0	2	2	2	2	2
CO3	2	2	2	3	1	1	0	0	0	0	0	3	3	1	1
CO4	3	3	3	3	2	2	1	0	1	0	0	3	3	2	2
CO5	2	3	3	2	1	1	0	1	2	0	2	2	2	2	2
CO6	2	2	2	3	1	1	0	0	0	0	0	3	3	1	1