IIPM SCHOOL OF ENGINEERING AND TECHNOLOGY
LESSON PLAN: SUMMER 2022
THEORY OF MACHINES

Branch : **Mechanical** **Semester: 4th**
Duration : **60**
Faculty name : **Saritprava Sahoo**
Objective : Mechanical and Automobile engineering is involved with design, manufacturing and use of various types of machines. Each machine consists of a large number static and moving parts called mechanisms. Theory of machines is study of such different kind of mechanisms.

Learning Outcome : Understanding effectiveness of

- ✓ *machine system consisting of different link assemblies as components*
- ✓ *Working principle of machine components such as clutch, brakes bearings based on friction*
- ✓ *Working principles related to power transmission systems and predicting the work involved and efficiency.*
- ✓ *working principle in speed and torque regulating devices such as governor and flywheels*
- ✓ *amount and position of masses required towards static and dynamic balancing*
- ✓ *types and causes of vibration in machines and predicting remedial measures*

Sl. No	Chapter	Proposed Week for Teaching	Period No.	Subject Name	Important Teaching Points	Content Source
1	**I**	1st	1	Simple mechanism	➢ Definition of Theory of Machines ➢ Classification of Theory of Machines	**Theory of Machine R.S Khurmi**
2			2		➢ Link ,kinematic chain	
3			3		➢ Inversion, four bar link mechanism and its inversion	
4			4		➢ Lower pair and higher pair ➢ mechanism, machine	
5		2nd	1		➢ Cam and followers	
6			2		➢ Solved Simple Numerical	
7			3		➢ ASSIGNMENT	
8			4		➢ CLASS TEST	
9		3rd	1	**Friction**	➢ Friction between nut and screw for square thread,	**Theory of Machine R.S Khurmi**
10			2		➢ screw jack	
11			3		➢ Bearing and its classification, Description of roller	
12			4		➢ Needle roller& ball bearings.	
13	**II**	4th	1		➢ Torque transmission in flat pivot bearings	
14			2		➢ Torque transmission in conical pivot bearings.	

15			3		➢ Flat collar bearing of single and multiple types.	
16			4		➢ Torque transmission for single and multiple clutches	
17		5th	1		➢ Working of simple frictional brakes.	
18			2		➢ Working of Absorption type of dynamometer	
19			3		➢ ASSIGNMENT	
20			4		➢ CLASS TEST	
21	**III**	4th	1	Power Transmission	➢ Concept of power transmission	**Theory of Machine R.S Khurmi**
22			2			
23			3		➢ Type of drives, belt, gear and chain drive.	
24			4		➢ Computations of velocity ratio, Computation of velocity ratio,	
25		5th	1		➢ Lengths of belts open with and without slip.	
26			2		➢ Lengths of belts cross with and without slip.	
27			3		➢ Ratio of belt tensions, centrifugal tension and initial tension.	
28			4		➢ Power transmitted by the belt. ➢ Determine belt thickness and width for given permissible	
29		6th	1		➢ Stress for open and crossed belt considering centrifugal tension.	
30			2		➢ V-belts and V-belts pulleys. Concept of crowning of pulleys.	
31			3		➢ Gear drives and its terminology.	
32			4		➢ Gear trains, working principle of simple, compound	
33		7th	1		➢ Working principle, reverted and epicyclic gear trains.	
34			2		➢ Solved Simple Numerical	
35			3		➢ ASSIGNMENT	
36			4		➢ CLASS TEST	
37	**IV**	8th	1		➢ Function of governor	
38			2		➢ Classification of governor	
39			3		➢ Working of Watt, Porter governors	
40			4		➢ Working of Proel and Hartnell governors.	

41		9th	1	Governors and Flywheel	➢ Conceptual explanation of sensitivity, stability and isochronisms.	**Theory of Machine R.S Khurmi**
42			2		➢ Function of flywheel	
43			3		➢ Comparison between flywheel &governor. 4	
44			4		➢ Fluctuation of energy and	
		10th	1		➢ Coefficient of fluctuation of speed.	
45			2		➢ Solved Simple Numerical	
46			3		➢ ASSIGNMENT	
47			4		➢ CLASS TEST	
48	**V**	11th	1	Balancing of Machine	➢ Concept of static and dynamic balancing.	**Theory of Machine R.S Khurmi**
49						
50			2		➢ Static balancing of rotating parts.	
51			3		➢ Principles of balancing of reciprocating parts.	
52						
			4		➢ Causes and effect of unbalance.	
53						
54		12th	1		➢ Difference between static and dynamic balancing	
55			2		➢ ASSIGNMENT	
56			3		➢ CLASS TEST	
57			4		➢ ASSIGNMENT	
58	VI	13th	1	Vibration of machine parts	➢ Introduction to Vibration and related terms (Amplitude, time period and frequency, cycle)	**Theory of Machine R.S Khurmi**
59			2			
60			3		➢ Classification of vibration.	
61			4		➢ Basic concept of natural, forced & damped vibration	
62		14th	1		➢ Torsional and Longitudinal vibration.	
			2		➢ Causes & remedies of vibration.	
63						
			3		➢ ASSIGNMENT	
64			4		➢ CLASS TEST	

Text book suggested :

- **Text Book of Theory of Machine** **R.S Khurmi S.Chand** **S.Chand**
- **Text Book of Theory of Machine** **R.K. Rajput** **S.Chand**

Signature of Faculty Member HOD Principal/ Director