



GOVERNMENT POLYTECHNIC, NABARANGPUR

DEPARTMENT OF AUTOMOBILE ENGINEERING

Discipline: AUTOMOBILE ENGG.	Semester: 4TH	Name of the Teaching Faculty: Sri Kiran Kumar Behera
Subject: THEORY OF MACHINES (TH.01)	No. of days/per week class allotted: 04	Semester From date: 04.02.2025 To Date: 17.05.2025 No. of Weeks: 15
COURSE OUTCOMES	CO1: Understanding machine system consisting of different link assemblies as components , Comprehending Working principle of machine components such as clutch, brakes, bearings based on friction . CO2: Comprehending working principles related to power transmission systems, speed and torque regulating devices such as governor and flywheels CO3: Determination of amount and position of masses required towards static and dynamic balancing . CO4: Comprehending types and causes of vibration in machines and predicting remedial measures .	
Week	Class Day	Theory/Practical Topics
1ST	1ST	1.0 Simple mechanism Link ,kinematic chain, mechanism, machine Inversion, four bar link mechanism and its inversion
	2ND	Link ,kinematic chain, mechanism, machine Inversion, four bar link mechanism and its inversion
	3RD	Lower pair and higher pair Cam and followers (Contd..)
	4TH	QUIZ & ASSIGNMENT
2ND	1ST	Lower pair and higher pair Cam and followers.
	2ND	2.0 Friction Friction between nut and screw for square thread, screw jack
	3RD	Bearing and its classification, Description of roller, needle roller& ball bearings.
	4TH	Bearing and its classification, Description of roller, needle roller& ball bearings.
3RD	1ST	Torque transmission in flat pivot& conical pivot bearings. (Contd...)
	2ND	Torque transmission in flat pivot& conical pivot bearings.
	3RD	Flat collar bearing of single and multiple types.
	4TH	QUIZ & ASSIGNMENT
4TH	1ST	Flat collar bearing of single and multiple types.
	2ND	Torque transmission for single and multiple clutches
	3RD	Working of simple frictional brakes.
	4TH	Working of Absorption type of dynamometer (Contd..)
5TH	1ST	Working of Absorption type of dynamometer
	2ND	3.0 Power Transmission
	3RD	Concept of power transmission type of drives, belt, gear and chain drive.
	4TH	Computation of velocity ratio, length of belts (open and cross)with and without slip.

6 TH	1 ST	Computation of velocity ratio, length of belts (open and cross) with and without slip.
	2 ND	Ratio of belt tensions, centrifugal tension and initial tension.
	3 RD	Ratio of belt tensions, centrifugal tension and initial tension.
	4 TH	QUIZ & ASSIGNMENT
7 TH	1 ST	Power transmitted by the belt.
	2 ND	Determine belt thickness and width for given permissible stress for open and crossed belt considering centrifugal tension. (Contd..)
	3 RD	Determine belt thickness and width for given permissible stress for open and crossed belt considering centrifugal tension.
	4 TH	V-belts and V-belts pulleys Concept of crowning of pulleys.
8 TH	1 ST	Gear drives and its terminology. (Contd..)
	2 ND	Gear drives and its terminology.

	3 RD	Gear trains, working principle of simple, compound, reverted and epicyclic gear trains.
	4 TH	Gear trains, working principle of simple, compound, reverted and epicyclic gear trains.
9 TH	1 ST	4.0 Governors and Flywheel
	2 ND	Function of governor
	3 RD	Classification of governor
	4 TH	Working of Watt, Porter, Proel and Hartnell governors. (Contd..)
10 TH	1 ST	Working of Watt, Porter, Proel and Hartnell governors.
	2 ND	Conceptual explanation of sensitivity, stability and isochronisms.
	3 RD	Function of flywheel.
	4 TH	Comparison between flywheel & governor. Fluctuation of energy and coefficient of fluctuation of speed.
11 TH	1 ST	5.0 Balancing of Machine
	2 ND	Concept of static and dynamic balancing.
	3 RD	Static balancing of rotating parts.
	4 TH	QUIZ & ASSIGNMENT
12 TH	1 ST	Principles of balancing of reciprocating parts. Causes and effect of unbalance.
	2 ND	Principles of balancing of reciprocating parts. Causes and effect of unbalance.
	3 RD	Difference between static and dynamic balancing (Contd..)
	4 TH	Difference between static and dynamic balancing
13 TH	1 ST	6.0 Vibration of machine parts
	2 ND	Vibration of machine parts
	3 RD	Introduction to Vibration and related terms (Amplitude, time period and frequency, cycle)
	4 TH	QUIZ & ASSIGNMENT
14 TH	1 ST	Introduction to Vibration and related terms (Amplitude, time period and frequency, cycle). (Contd..)
	2 ND	Introduction to Vibration and related terms (Amplitude, time period and frequency, cycle)
	3 RD	Classification of vibration.
	4 TH	QUIZ & ASSIGNMENT
15 TH	1 ST	Basic concept of natural, forced & damped vibration
	2 ND	Torsional and Longitudinal vibration.
	3 RD	Causes & remedies of vibration.

LEARNING RESOURCES:

Learning Resources: Sl No.	Name of the Book	Author Name	Publisher
1.	Text Book of Theory of Machine	R.S Khurmi	S.Chand
2.	Text Book of Theory of Machine	R.K. Rajput	S.Chand
3.	Text Book of Theory of Machine	P.L.Ballany	Dhanpat Rai
4.	Text Book of Theory of Machine	Thomas Bevan	Pearson

Yinay Y. P. Chaudhary

Sign. Of Faculty
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Academic Coordinator

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