

**GOVT. POLYTECHNIC KANDHAMAL, (PHULBANI)**

**LESSON PLAN: THEORY OF MACHINES & MECHANISM**

**4<sup>TH</sup> – SEMESTER, 2026 (S)**

Discipline: <b>Mechanical Engineering</b>	Semester: <b>Summer 2026</b>	Name of the teaching faculty: <b>SNEHASISH MUDULI</b>
Subject: <b>TOM</b>	No of days/per week class allotted: <b>03</b>	Semester From Date: <b>22.12.2025</b> To Date: <b>18.04.2026</b> No of weeks: <b>16</b>
Week:	Class day:	<b>Theory/practical topics:</b>
<b>1<sup>ST</sup></b>	<b>1<sup>ST</sup></b>	<b>Unit – 1</b> <b>(Simple mechanism)</b> Link , kinematic pair and types (Lower pair and higher pair) , kinematic chain, mechanism, Inversion,
	<b>2<sup>ND</sup></b>	Four bar link mechanism and its inversion
	<b>3<sup>RD</sup></b>	Four bar link mechanism and its inversion
<b>2<sup>ND</sup></b>	<b>1<sup>ST</sup></b>	<b>(Cams and Followers)</b> Concept; Definition and application of Cams and Followers; Classification of Cams and Followers;
	<b>2<sup>ND</sup></b>	Different follower motions and their displacement diagrams like uniform velocity, SHM, uniform acceleration and Retardation;
	<b>3<sup>RD</sup></b>	Different follower motions and their displacement diagrams like uniform velocity, SHM, uniform acceleration and Retardation;
<b>3<sup>RD</sup></b>	<b>1<sup>ST</sup></b>	Revision
	<b>2<sup>ND</sup></b>	<b>Unit – 2 (Power Transmission)</b> Types of Drives – Belt, Chain, Rope, Gear drives & their comparison; Belt Drives - flat belt, V– belt & its applications;
	<b>3<sup>RD</sup></b>	Material for flat and V-belt; Angle of lap, Belt length. Slip and Creep; Determination of Velocity Ratio,
<b>4<sup>TH</sup></b>	<b>1<sup>ST</sup></b>	Ratio of tight side and slack side tension; Centrifugal tension and Initial tension; Condition for maximum power transmission (Simple numerical)
	<b>2<sup>ND</sup></b>	Simple numerical
	<b>3<sup>RD</sup></b>	Chain Drives – Advantages & Disadvantages; Selection of Chain & Sprocket wheels; Methods of lubrication;
<b>5<sup>TH</sup></b>	<b>1<sup>ST</sup></b>	Gear Drives – Spur gear terminology; Types of gears and gear trains, their selection for different applications;
	<b>2<sup>ND</sup></b>	Gear Drives – Spur gear terminology; Types of gears and gear trains, their selection for different applications;
	<b>3<sup>RD</sup></b>	Train value & Velocity ratio for compound, reverted and simple epicyclic gear train;

6 <sup>TH</sup>	1 <sup>ST</sup>	Methods of lubrication; Law of gearing; Rope Drives – Types, applications, advantages & limitations of Steel ropes.
	2 <sup>ND</sup>	Simple Numerical
	3 <sup>RD</sup>	Simple Numerical
7 <sup>TH</sup>	1 <sup>ST</sup>	<b>Unit – 3 (Flywheel and Governors)</b> Flywheel - Concept, function and application of flywheel with the help of turning moment diagram for single cylinder 4-Stroke I.C. Engine (no Numerical);
	2 <sup>ND</sup>	Flywheel - Concept, function and application of flywheel with the help of turning moment diagram for single cylinder 4-Stroke I.C. Engine (no Numerical);
	3 <sup>RD</sup>	Coefficient of fluctuation of energy, Coefficient of fluctuation of speed and its significance;
8 <sup>TH</sup>	1 <sup>ST</sup>	Governors - Types and explanation with neat sketches (Centrifugal, Watt and Porter)
	2 <sup>ND</sup>	Governors - Types and explanation with neat sketches (Centrifugal, Watt and Porter)
	3 <sup>RD</sup>	Governors - Types and explanation with neat sketches (Centrifugal, Watt and Porter)
9 <sup>TH</sup>	1 <sup>ST</sup>	Concept, function and applications & Terminology of Governors (sensitivity, stability and isochronisms);
	2 <sup>ND</sup>	Simple numerical on Watt and Porter Governor.
	3 <sup>RD</sup>	Simple numerical on Watt and Porter Governor.
10 <sup>TH</sup>	1 <sup>ST</sup>	Comparison between Flywheel and Governor
	2 <sup>ND</sup>	<b>Unit – 4 (Brakes, Dynamometers, Clutches &amp; Bearings)</b> Function of brakes and dynamometers; Types of brakes and Dynamometers;
	3 <sup>RD</sup>	Comparison between brakes and dynamometers; Construction and working of i) shoe brake, ii) Band Brake,
11 <sup>TH</sup>	1 <sup>ST</sup>	Numerical problems to find braking force and braking torque for shoe & band brakes
	2 <sup>ND</sup>	Numerical problems to find braking force and braking torque for shoe & band brakes
	3 <sup>RD</sup>	Concept of Self Locking & Self energizing brakes, Construction and working of i) Rope Brake Dynamometer, ii) Hydraulic Dynamometer
12 <sup>TH</sup>	1 <sup>ST</sup>	Clutches- Uniform pressure and Uniform Wear theories; Function of Clutch and its application; Construction and working of i) Single plate clutch, ii) Multi plate clutch
	2 <sup>ND</sup>	iii) Centrifugal Clutch iv) Cone clutch and v) Diaphragm clutch. (Simple numerical on single and Multi plate clutch)
	3 <sup>RD</sup>	Simple numerical on single and Multi plate clutch

13 <sup>TH</sup>	1 <sup>ST</sup>	Bearings – i) Simple Pivot, ii) Collar Bearing, iii) Conical pivot. Torque & power lost in friction (no derivation).
	2 <sup>ND</sup>	Simple numerical on Bearings
	3 <sup>RD</sup>	<b>Unit – 5 (Balancing &amp; Vibrations)</b> Concept of balancing; Balancing of single rotating mass;
14 <sup>TH</sup>	1 <sup>ST</sup>	Graphical method for balancing of several masses revolving in same plane;
	2 <sup>ND</sup>	Concept and terminology used in vibrations,
	3 <sup>RD</sup>	Causes of vibrations in machines; their harmful effects and remedies.
15 <sup>TH</sup>	1 <sup>ST</sup>	Causes of vibrations in machines; their harmful effects and remedies.
	2 <sup>ND</sup>	Revision
	3 <sup>RD</sup>	Revision
16 <sup>TH</sup>	1 <sup>ST</sup>	Revision
	2 <sup>ND</sup>	Revision
	3 <sup>RD</sup>	Revision

*Duduli*  
22/12/25  
Sign. of Faculty Concerned

*Pras*  
22/12/2025  
Sign. of HOD