

Lesson Plan

Name of the Faculty : Dr. Rajender Kumar Tayal
 Discipline : Mechanical Engineering
 Semester : 5th
 Subject : Theory of Machines (TOM)
 Lesson Plan duration : 15 weeks (01.09.2023 to 15.12.2023)
 Work load per week : Lecture – 03, Practical – 02

Week	Theory		EXECUTION	
	Lecture Day	Topic (Including assessment/test)	Date	Sign.
1 st	1 st	Introduction about the subject and brief overview.		
	2 nd	1 Simple Mechanisms: 1.1 Kinematics of Machines: - Definition of Kinematics, Dynamics, Statics, Kinetics, Kinematic link, Kinematic Pair and its types		
	3 rd	1.1 Constrained motion and its types, Kinematic chain and its types		
2 nd	4 th	1.1 Mechanism, inversion, machine and structure. 1.2 Inversions of Kinematic Chain: Inversion of four bar chain, coupled wheels of Locomotive & Pantograph.		
	5 th	1.2 Inversion of Single Slider Crank chain- Rotary I.C. Engines mechanism, Crank and Slotted lever quick return mechanism.		
	6 th	1.2 Inversion of Double Slider Crank Chain- Scotch Yoke Mechanism & Oldham's Coupling.		
3 rd	7 th	2 Power Transmission: 2.1 Introduction to Belt and Rope drives. 2.2 Types of belt drives. 2.3 Concept of velocity ratio, slip and creep; crowning of pulleys (simple numericals)		
	8 th	2.4 Flat and V belt drive: Ratio of driving tensions, power transmitted, centrifugal tension, and condition for maximum horse power (simple numericals)		
	9 th	2.4 (simple numericals)		
4 th	10 th	2.5 Different types of chains and their terminology		
	11 th	2.6 Gear Drive - Simple, compound, reverted and epicyclic gear trains (simple numericals)		
	12 th	2.7 Relative advantages and disadvantages of various drives		

5 th	13 th	3. Flywheel: 3.1 Principle and applications of flywheel		
	14 th	3.2 Turning - moment diagram of flywheel for different engines.		
	15 th	3.3 Fluctuation of speed and fluctuation of energy - Concept only.		
6 th	16 th	3.4 Coefficient of fluctuation of speed and coefficient of fluctuation of energy.		
	17 th	1st sessional test (Tentative)		
	18 th	Assessment		
7 th	19 th	4. Governor: 4.1 Function of a governor, comparison of flywheel and governor.		
	20 th	4.2 Simple description and working of Watt governor,		
	21 st	4.2 Simple description and working of Porter governor,		
8 th	22 nd	4.2 Simple description and working of Hartnel governor,		
	23 rd	4.2 Simple numerical based on watt and porter governor		
	24 th	4.3 Terminology used in governors: Height, equilibrium speed, hunting, isochronism, stability, sensitiveness of a governor.		
9 th	25 th	5. Cams: 5.1 Definition and function of cam. Description of different types of cams and followers with simple line diagram.		
	26 th	5.2 Terminology of cam profile.		
	27 th	5.3 Displacement diagram for uniform velocity.		
10 th	28 th	5.3 Displacement diagram for uniform acceleration and deceleration.		
	29 th	2nd sessional test (Tentative)		
	30 th	Assessment		
11 th	31 st	6. Balancing: 6.1 Need of balancing, Concept of static and dynamic balancing.		
	32 nd	6.1 Need of balancing, Concept of static and dynamic balancing.		
	33 rd	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		
12 th	34 th	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		
	35 th	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		

	36 th	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		
13 th	37 th	7. Vibrations: 7.1 Causes of vibrations in machines, Their harmful effects and remedies		
	38 th	7.2 Types-longitudinal, transverse and torsional vibrations.		
	39 th	7.2 Types-longitudinal, transverse and torsional vibrations.		
14 th	40 th	7.3 Damping of vibrations		
	41 st	3rd sessional test (Tentative)		
	42 nd	Assessment		
15 th	43 rd	Revision		
	44 th	Revision		
	45 th	Revision		

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Week	Practical		EXECUTION		
	Practical Day	Topic	G1	G2	Sign.
1 st	1 st	Introduction about the Lab & brief discussion over the Lab practical's to be conducted.			
2 nd	2 nd	1. To study inversion of Four Bar Mechanism, Single Slider Crank Chain Mechanism and Double Slider Crank Chain Mechanism with the help of working models.			
3 rd	3 rd	1. To study inversion of Four Bar Mechanism, Single Slider Crank Chain Mechanism and Double Slider Crank Chain Mechanism with the help of working models			
4 th	4 th	2. To study various kinds of belts drives and gear trains with the help of working models.			
5 th	5 th	3. To find the moment of inertia of a flywheel.			
6 th	6 th	Checking of Practical file/ 1st sessional test (Tentative)			
7 th	7 th	4. To Study the different types of centrifugal governors & to plot graph between R.P.M & Displacement.			
8 th	8 th	4. To Study the different types of centrifugal governors & to plot graph between R.P.M & Displacement.			

9 th	9 th	5. To construct cam profile for uniform velocity, SHM and uniform acceleration and retardation on drawing sheet.			
10 th	10 th	Checking of Practical file/ 2nd sessional test (Tentative)			
11 th	11 th	5. To construct cam profile for uniform velocity, SHM and uniform acceleration and retardation on drawing sheet.			
12 th	12 th	5. To construct cam profile for uniform velocity, SHM and uniform acceleration and retardation on drawing sheet.			
13 th	13 th	6. To perform the experiment of Balancing of rotating parts and find the unbalanced couple and forces.			
14 th	14 th	Checking of Practical file/ 3rd sessional test (Tentative)			
15 th	15 th	Checking of Practical file/ Evaluation.			