

Lesson Plan

Name of the Faculty : Dr. Rajender Kumar Tayal

Discipline : Mechanical Engineering

Semester : 5th

Subject : Theory of Machines (TOM)

Lesson Plan duration : 17 weeks (15.09.2022 to 16.01.2023)

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.		
	5 th	1.2 Inversions of Kinematic Chain: Inversion of four bar chain, coupled wheels of Locomotive & Pantograph.		
	6 th	1.2 Inversion of Single Slider Crank chain- Rotary I.C. Engines mechanism, Crank and Slotted lever quick return mechanism.		
3 rd	7 th	1.2 Inversion of Double Slider Crank Chain- Scotch Yoke Mechanism & Oldham's Coupling.		
	8 th	2 Power Transmission: 2.1 Introduction to Belt and Rope drives. 2.2 Types of belt drives.		
	9 th	2.3 Concept of velocity ratio, slip and creep; crowning of pulleys (simple numericals)		
4 th	10 th	2.4 Flat and V belt drive: Ratio of driving tensions, power transmitted, centrifugal tension, and condition for maximum horse power (simple numericals)		
	11 th	2.4 (simple numericals)		
	12 th	2.5 Different types of chains and their terminology		

5 th	13 th	2.6 Gear Drive - Simple, compound, reverted and epicyclic gear trains (simple numericals)		
	14 th	2.7 Relative advantages and disadvantages of various drives		
	15 th	3. Flywheel: 3.1 Principle and applications of flywheel		
6 th	16 th	3.2 Turning - moment diagram of flywheel for different engines.		
	17 th	3.3 Fluctuation of speed and fluctuation of energy - Concept only.		
	18 th	3.4 Coefficient of fluctuation of speed and coefficient of fluctuation of energy.		
7 th	19 th	1st sessional test (Tentative)		
	20 th	Assessment		
	21 st	4. Governor: 4.1 Function of a governor, comparison of flywheel and governor.		
8 th	22 nd	4.2 Simple description and working of Watt governor,		
	23 rd	4.2 Simple description and working of Porter governor,		
	24 th	4.2 Simple description and working of Hartnell governor,		
9 th	25 th	4.2 Simple numerical based on watt and porter governor		
	26 th	4.3 Terminology used in governors: Height, equilibrium speed, Hunting,		
	27 th	4.3 Terminology used in governors: isochronisms stability, sensitiveness of a governor.		
10 th	28 th	5. Cams: 5.1 Definition and function of cam. Description of different types of cams and followers with simple line diagram.		
	29 th	5.1 Description of different types of cams and followers with simple line diagram.		
	30 th	5.2 Terminology of cam profile.		
11 th	31 st	5.3 Displacement diagram for uniform velocity.		
	32 nd	5.3 Displacement diagram for S.H.M.		
	33 rd	5.3 Displacement diagram for uniform acceleration and deceleration.		

12 th	34 th	2nd sessional test (Tentative)		
	35 th	Assessment		
	36 th	6. Balancing: 6.1 Need of balancing, Concept of static and dynamic balancing.		
13 th	37 th	6.1 Need of balancing, Concept of static and dynamic balancing.		
	38 th	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		
	39 th	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		
14 th	40 th	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		
	41 st	6.2 Introduction to balancing of rotating masses in the same plane and different Planes (simple numericals)		
	42 nd	7. Vibrations: 7.1 Causes of vibrations in machines, Their harmful effects and remedies		
15 th	43 rd	7.2 Types-longitudinal, transverse and torsional vibrations.		
	44 th	7.2 Types-longitudinal, transverse and torsional vibrations.		
	45 th	7.3 Damping of vibrations		
16 th	46 th	3rd sessional test (Tentative)		
	47 th	Assessment		
	48 th	Revision		
17 th	49 th	Revision		
	50 th	Revision		
	51 st	Revision		

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Week			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	2. To study various kinds of belts drives and gear trains with the help of working models.			
6 th	6 th	3. To find the moment of inertia of a flywheel.			
7 th	7 th	Checking of Practical file/ 1st sessional test (Tentative)			
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	4. To Study the different types of centrifugal governors & to plot graph between R.P.M & Displacement.			
10 th	10 th	5. To construct cam profile for uniform velocity, SHM and uniform acceleration and retardation on drawing sheet.			
11 th	11 th	Checking of Practical file/ 2nd sessional test (Tentative)			
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	5. To construct cam profile for uniform velocity, SHM and uniform acceleration and retardation on drawing sheet.			
14 th	14 th	6. To perform the experiment of Balancing of rotating parts and find the unbalanced couple and forces.			
15 th	15 th	6. To perform the experiment of Balancing of rotating parts and find the unbalanced couple and forces.			
16 th	16 th	Checking of Practical file/ 3rd sessional test (Tentative)			
17 th	17 th	Checking of Practical file/ Evaluation.			