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 (01.10.2021 to 28.01.2022)

Work load per week : Lecture – 03, Practical – 02

Week	Theory	
	Lecture Day	Topic (Including assessment/test)
1st	1st	Subject introduction and overview
	2nd	**1 Simple Mechanisms:** 1.1 Kinematics of Machines: - Definition of Kinematics, Dynamics, Statics, Kinetics, Kinematic link, Kinematic Pair and its types
	3rd	1.1 Constrained motion and its types, Kinematic chain and its types
2nd	4th	1.1 Mechanism, inversion, machine and structure.
	5th	1.2 Inversions of Kinematic Chain: Inversion of four bar chain, coupled wheels of Locomotive & Pantograph.
	6th	1.2 Inversion of Single Slider Crank chain- Rotary I.C. Engines mechanism, Crank and Slotted lever quick return mechanism.
3rd	7th	1.2 Inversion of Double Slider Crank Chain- Scotch Yoke Mechanism & Oldham's Coupling.
	8th	**2 Power Transmission:** 2.1 Introduction to Belt and Rope drives. 2.2 Types of belt drives.
	9th	2.3 Concept of velocity ratio, slip and creep; crowning of pulleys (simple numericals)
4th	10th	2.4 Flat and V belt drive: Ratio of driving tensions, power transmitted, centrifugal tension, and condition for maximum horse power (simple numericals)
	11th	2.5 Different types of chains and their terminology
	12th	2.6 Gear Drive - Simple, compound, reverted and epicyclic gear trains(simple numericals)
5th	13th	2.7 Relative advantages and disadvantages of various drives

	14th	Simple numericals
	15th	Simple numericals
6th	16th	**3. Flywheel:** 3.1 Principle and applications of flywheel
	17th	3.2 Turning - moment diagram of flywheel for different engines.
	18th	3.3 Fluctuation of speed and fluctuation of energy - Concept only.
7th	19th	**1st sessional test (Tentative)**
	20th	**Assessment**
	21st	3.4 Coefficient of fluctuation of speed and coefficient of fluctuation of energy.
8th	22nd	Simple numericals
	23rd	Simple numericals
	24th	**4. Governor:** 4.1 Function of a governor, comparison of flywheel and governor.
9th	25th	4.2 Simple description and working of Watt and Porter governor
	26th	4.2 Simple description and working of Hartnel governor
	27th	4.2 Simple numerical based on watt and porter governor
10th	28th	4.2 Simple numerical based on watt and porter governor
	29th	4.3 Terminology used in governors: Height, equilibrium speed, Hunting, isochronisms
	30th	Stability, sensitiveness of a governor.
11th	31st	**2nd sessional test (Tentative)**
	32nd	**Assessment**
	33rd	**5. Cams:** 5.1 Definition and function of cam
12th	34th	5.1 Description of different types of cams and followers with simple line diagram.
	35th	5.2 Terminology of cam profile.
	36th	5.3 Displacement diagram for uniform velocity.
13th	37th	5.3 Displacement diagram for S.H.M.
	38th	5.3 Displacement diagram for uniform acceleration and deceleration.

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