Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research
Name of the Faculty member : Ashwani Verma (Assistant Professor)
Discipline : Mechanical Engineering
Semester : 6th
Subject : Machine Design-II (ME-310N)
Lesson Plan Duration : 15 weeks (from January 2020 to April 2020)
Work Load : L-2 T-4 P-0

Week	Theory		Tutorial	
	Lecture day	Topic (including assignment/test)	Tutorial day	Topic
1st	1st	UNIT-I **Gear Drives:** Classification of gears, selection of type of gears, law of gearing, standard systems of gear tooth.	1st	Standard systems of gear tooth.
	2nd	Interference and undercutting, backlash, **Spur Gears:** geometry and nomenclature, force analysis, material selection.		Law of gearing.
			2nd	Nomenclature of spur gear
				Force analysis.
2nd	3rd	Beam strength of gear tooth, effective load on gear tooth.	3rd	Numerical on design of spur gears.
	4th	Module estimation based on beam strength, wear strength of gear tooth, module estimation based on wear strength, spur gear design procedure.		Numerical on design of spur gears.
			4th	Numerical on design of spur gears.
				Numerical on design of spur gears.
3rd	5th	**Helical Gears:** geometry and nomenclature, force analysis, beam strength of helical gears, effective load on gear tooth, wear strength of helical gears, design procedure.	5th	Numerical on design of helical gears.
	6th	**Worm Gears:** terminology, force analysis, friction in worm gears, material selection, strength rating and wear rating, thermal considerations and design procedure.		Numerical on design of helical gears.
			6th	Numerical on design of worm gears.
				Numerical on design of worm gears.
4th	7th	**Bevel Gears:** geometry and nomenclature, force analysis, beam strength of bevel gears, effective load on gear tooth, wear strength of bevel gears, design procedure. Assignment.	7th	Numerical on design of bevel gears.
	8th	UNIT-II **Flat Belt Drives and Pulleys:** Introduction, Selection of flat belts from manufacturer's catalogue, Pulleys for flat belts.		Numerical on design of bevel gears.
			8th	Numerical on selection of flat belt.
				Numerical on flat belt pulley.
5th	9th	**V-Belts and Pulley:** selection of V-Belts and V-grooved pulley.	9th	Numerical on selection of V- belt.
	10th	**Chain Drives:** roller chains, geometric relationships, polygonal effect, power rating, sprocket wheels, design of chain drives, chain lubrication.		Numerical on selection of V- belt.
			10th	Numerical on selection of chain and design for a

				chain drive.
				Numerical on selection of chain and design for a chain drive.
6th	11th	**Clutches:** Various types of clutches in use, design of friction clutches namely single disc, multidisc, torque transmitting capacity, friction materials.	11th	Numerical on design of single disc clutch.
	12th	Design of cone clutch and, torque transmitting capacity.		Numerical on design of multi disc clutch.
			12th	Numerical on design of cone clutch.
				Numerical on design of cone clutch.
7th	13th	Design of centrifugal clutch, torque transmitting capacity.	13th	Numerical on design of centrifugal clutch.
	14th	Thermal considerations.		Numerical on design of centrifugal clutch.
			14th	Numerical on design of clutch with thermal considerations.
				Continued.
8th	15th	**Brakes:** Various types of brakes, self-energizing condition of brakes, design of external expanding shoe brakes.	15th	Numerical on design of external expanding shoe brakes.
	16th	Design of internal expanding shoe brakes.		Numerical on design of external expanding shoe brakes.
			16th	Numerical on design of internal expanding shoe brakes.
				Numerical on design of internal expanding shoe brakes.
9th	17th	Band brakes, thermal considerations in brake designing. Assignment.	17th	Numerical on design of band brake.
	18th	UNIT-III **Springs:** Types of springs, and their uses, design for helical springs against tension/compression.		Numerical on design of band brake.
			18th	Numerical on design for helical springs.
				Numerical on design for helical springs.
10th	19th	Design for helical springs against fluctuating loads, surging in springs.	19th	Numerical on design for helical springs subjected to fluctuating loads.
	20th	Design of leaf springs.		Numerical on design for helical springs subjected to fluctuating loads.
			20th	Numerical on design of leaf springs.
				Numerical on design of leaf springs.
11th	21st	**Bearings:** Classification, selection of bearing type.	21st	Numerical on design of leaf springs.
	22nd	Static and dynamic load carrying capacity, equivalent bearing load, load-life relationship.		Numerical on design of leaf springs.
			22nd	Numerical on selection of bearings from manufacturer's catalogue
				Numerical on selection of bearings from manufacturer's catalogue

12th	23rd	Selection of bearings from manufacturer's catalogue, selection of taper roller bearing.	23rd	Numerical on selection of taper roller bearing.
	24th	Design for cyclic loads and speeds, bearing failure-causes and analysis.		Numerical on selection of taper roller bearing.
			24th	Numerical on design for cyclic loads and speeds for ball bearing.
				Numerical on design for cyclic loads and speeds for ball bearing.
13th	25th	**Sliding Contact Bearings:** design of journal bearings using Raimondi and Boyd's Charts. Assignment.	25th	Numerical on design of journal bearings using Raimondi and Boyd's Charts.
	26th	UNIT IV **I.C. Engine Components:** Design of cylinder, design of studs for cylinder head.		Numerical on design of journal bearings using Raimondi and Boyd's Charts.
			26th	Numerical on design of cylinder.
				Numerical on design of studs for cylinder head.
14th	27th	Design of piston.	27th	Numerical on design of piston.
	28th	Design of connecting rod.		Numerical on design of piston.
			28th	Numerical on design of connecting rod.
				Numerical on design of connecting rod.
15th	29th	Design of crank shaft.	29th	Numerical on design of crank shaft.
	30th	**Flywheel:** Flywheel materials, torque analysis, coefficient of fluctuation of energy, design of solid disc and rimmed flywheel. Assignment.		Numerical on design of crank shaft.
			30th	Numerical on design of solid disc flywheel.
				Numerical on design of rimmed flywheel.

(Signature of the teacher concerned with date)