NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: TH-5(AUTOMOBILE COMPONENT DESIGN)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	BASIC CONCEPET OF DESIGN	12	12
2	DESIGN OF MACHINE ELEMENT	6	6
3	DESIGN OF SHAFT KEY & COMPONENT	10	11
4	DESIGN OF LEVERS	6	6
5	Design of chassis component	10	11
7	DESIGN OF ENGINE COMPONENT	16	18
	Total Period:	60	64

Discipline: AUTOMOBILE ENGINEERING	**Semester:** 5th	**Name of the Teaching Faculty:** Er. SAROJ KUMAR PATRA
Week	**Class Day**	**Theory / Practical Topics**
1st	**1st**	*Basic concepts of design*
	2nd	Introduction to design
	3rd	Introduction to design
	4th	Classification of design
2nd	**1st**	Stress analysis
	2nd	Types of external loads
	3rd	Types of induced stresses: tensile, compressive, shear crushing & bearing
	4th	bending, torsion, thermal stresses, creep, proof stresses resilience principal stresses.
3rd	**1st**	Stress- strain diagram for ductile & brittle material and its importance
	2nd	*Variable stresses machine parts, fatigue & endurance limit, stress-time diagrams for variable stresses.*
	3rd	Working stresses for static load, variable or fatigue load
	4th	Factor of safety, selection of factor of safety
th	**1st**	Introduction to theories of failure-maximum principal theory. Maximum shear stress theory, Distribution energy theory
	2nd	Selection of material and justifications of automobile components, advanced materials for automotive components

4	**3rd**	.Concept of standardization, preferred numbers & inter chargeability in design practice.
	4th	Common types of fasteners with their applications-through bolts, tap bolts, top bolts, studies cap screws and machine screws
5th	**1st**	Bearings – classification, location in automobiles systems & selection of bearings.
	2nd	Post design aspects ergonomic aspect aesthetic consideration (shape, colour, surface finish) for automobile.
	3rd	*Post design aspects ergonomic aspect aesthetic consideration (shape, colour, surface finish) for automobile.*
	4th	*CLASS TEST*
6th	**1st**	Design of machine elements.
	2nd	Design of socket & spigot type cotter joint
	3rd	Design of socket & spigot type cotter joint
	4th	Design of knuckle joint
7th	**1st**	Design of turnbuckle
	2nd	Application of above machine elements in an automobile.
	3rd	Application of above machine elements in an automobile.
	4th	Design of shafts, keys &couplings
	1st	Design of shaft for torsion, rigidity, bending, combined bending &torsion..

8th	**2nd**	Design of shaft for torsion, rigidity, bending, combined bending &torsion..
	3rd	Compression of solid & hollow shafts
	4th	Design of propeller shaft, whirling & critical speed
9th	**1st**	Design of propeller shaft, whirling & critical speed
	2nd	Types of keys design of sunk rectangular key, woodruff key. Effect of keyways on shaft
	3rd	Design of coupling-muff, flange and bush pin type flexible
	4th	Design of coupling-muff, flange and bush pin type flexible
10th	**1st**	CLASS TEST
	2nd	*Design of levers.*
	3rd	Types of levers
	4th	Rocker arm
11th	**1st**	Hand lever
	2nd	Pedals for rectangular cross-section& fulcrum Pinonly
	3rd	Pedals for rectangular cross-section& fulcrum Pinonly
	4th	Design of chassis component

12th	**1st**	Design of cloth- single plate & multi plate
	2nd	Teeth calculation of gears for sliding mesh/constant mesh gear box of given data.
	3rd	Design of semi elliptical leaf spring, helical spring-torsion &compression
	4th	*Design of semi elliptical leaf spring, helical spring-torsion &compression*
13th	**1st**	Design of engine components
	2nd	Data of engine specifications & calculation of cylinder dimensions for given
	3rd	Design of cylinder head thickness &bolts
	4th	Design of valve seat & valve lift
14th	**1st**	Design of piston crown by bending strength & thermal considerations
	2nd	CLASS TEST
	3rd	Design of piston rings & skirt length
	4th	Design of piston rings & skirt length
15th	**1st**	bending & shear considerations.
	2nd	Design of connecting rod cross-section(I-section
	3rd	Design of big end, cap &bolt.

	4th	Design of over hung crankshaft.