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)

Name of the Faculty-Er.Saroj Kumar Patra

Branch- Automobile Engineering **Session**- 2024-25

Semester- 5th **Examination**- 2024 (W)

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	DESIGNOF CHASSIS	10	11
6	DESIGN OF ENGINE COMPONENT	16	16
	Total Period:	60	62

S. Patra 29/06/2024
sign of the faculty

29/06/24
Sign of H.O.D

Discipline: AUTOMOBILE ENGINEERING	Semester: 5th	Name of the Teaching Faculty: Er.Saroj Kumar Patra
		SESSION : 2024-25 EXAMINATION : 2024 (W)
Week	**Class Day**	**Topics to be Covered**
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
4th	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
	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	Post design aspects ergonomic aspect aesthetic consideration (shape, colour, surface finish) for automobile.
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 socket & spigot type cotter joint

Week	Class Day	Topics to be Covered
7th	1st	Design of knuckle joint
	2nd	Design of turnbuckle
	3rd	Application of above machine elements in an automobile.
	4th	Application of above machine elements in an automobile.
8th	1st	Design of shafts, keys &couplings
	2nd	Design of shaft for torsion, rigidity, bending, combined bending &torsion..
	3rd	Design of shaft for torsion, rigidity, bending, combined bending &torsion..
	4th	Compression of solid & hollow shafts
9th	1st	INTERNAL ASSESSMENT
	2nd	INTERNAL ASSESSMENT
	3rd	Types of keys design of sunk rectangular key, woodruff key. Effect of keyways on shaft
	4th	Design of coupling-muff, flange and bush pin type flexible
10th	1st	Design of coupling-muff, flange and bush pin type flexible
	2nd	Design of coupling-muff, flange and bush pin type flexible
	3rd	Design of levers.
	4th	Types of levers
11th	1st	Rocker arm
	2nd	Hand lever
	3rd	Pedals for rectangular cross-section& fulcrum Pinonly
	4th	Pedals for rectangular cross-section& fulcrum Pinonly
12th	1st	Design of chassis component
	2nd	Design of cloth- single plate & multi plate
	3rd	Teeth calculation of gears for sliding mesh/constant mesh gear box of given data.
	4th	Design of semi elliptical leaf spring, helical spring-torsion &compression
13th	1st	Design of semi elliptical leaf spring, helical spring-torsion &compression

Week	Class Day	Topics to be Covered
13th	2nd	Design of engine components
	3rd	Data of engine specifications & calculation of cylinder dimensions for given
	4th	Design of cylinder head thickness &bolts
14th	1st	Design of valve seat & valve lift
	2nd	Design of piston crown by bending strength & thermal considerations
	3rd	Design of piston crown by bending strength & thermal considerations
	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 big end, cap &bolt.
16th	1st	Design of over hung crankshaft.
	2nd	Design of over hung crankshaft.
	3rd	Design of over hung crankshaft.
	4th	Revision

29/06/22

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