

**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF AUTOMOBILE ENGINEERING**



LESSON PLAN

SUBJECT: AUTOMOBILE COMPONENT DESIGN (TH-5)

ACCADEMIC SESSION: 2022-23

FACULTY: KULADEEP MOHAPATRA

SEMESTER: 5TH

Sd/-
14/9/22
H O D (Automobile Engg.)
AOSE Cuttack

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Discipline:- Automobile Engg.	Semester :-5 TH	Name of the teaching faculty :- KULADEEP MOHAPATRA
Subject Name :- AUTOMOBILE COMPONENT DESIGN	No. Of Days/Week Class Allotted :- 04 Periods/Week (Monday, Tuesday, Wednesday, Friday – 1 Period Each)	Semester from Date - 15/09/2022 To Date - 22/12/2022 No. of Weeks: 14
WEEK	CLASS DAY	THEORY TOPICS
1st	16.09.2022	1. Basic concepts of design 1.1 Introduction to design 1.2 Classification of design
2nd	19.09.2022	1.3 Design Consideration
	20.09.2022	1.4 Design procedure
	21.09.2022	1.5 Stress analysis 1.5.1 Types of external load
	23.09.2022	1.5.2 Types of Induced stresses: tensile, compressive, shear crushing & bearing pressure, bending, torsion, thermal stresses, creep, proof stresses resilience principal stresses.
3rd	26.09.2022	1.5.3 Stress-strain diagram for ductile & brittle material and its importance.
	27.09.2022	1.5.3 Variable stresses machine parts, fatigue & endurance limit, stress-time diagrams for variable stresses.
	28.09.2022	1.5.4 Working stresses for static load, variable or fatigue load.
	30.09.2022	1.5.5 Factor of safety, selection of factor of safety.
		1.5.6 Stress concentration causes and remedies.
4th	10.10.2022	1.5.8 Introduction to theories of failure-maximum principal theory. Maximum shear stress theory, Distribution energy theory.

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	11.10.2022	1.5.9 Selection of material and justifications of automobile components, advanced materials for automotive components. 1.6 Concept of standardization, preferred numbers & interchangeability in design practice.
	12.10.2022	1.6.1 Common types of fasteners with their applications-through bolts, tapbolts, top bolts, studies cap screws and machine screws, designation of screw thread according to 1.5 stresses in screw fasteners, bolts of uniform strength.
	14.10.2022	1.6.1 Bearings – classification, location in automobiles systems & selection of bearings.
5 th	17.10.2022	1.6.3 Post design aspects ergonomic aspect aesthetic consideration (shape, colour, surface finish) for automobile.
	18.10.2022	CLASS TEST -1
	19.10.2022	2. Design of machine elements
	21.10.2022	2.1 Design of socket & spigot type cotter joint
6 th	25.10.2022	2.2 Design of knuckle joint
	26.10.2022	2.3 Design of turnbuckle
	28.10.2022	2.4 Application of above machine elements in an automobile.
7 th	31.10.2022	CLASS TEST -2
	01.11.2022	3. Design of shafts, keys & coupling
	02.11.2022	3.1 Conceptual understanding of shaft, axles & spindles.
	03.11.2022	3.2 Design of shaft for torsion rigidity, bending, combined bending & torsion.
	04.11.2022	3.3 Compression of solid & hollow shafts.
	05.11.2022	3.4 Design of propeller shaft.
	06.11.2022	3.4 whirling & critical speed
	07.11.2022	3.5 Design of rear axle.
8 th	07.11.2022	Types of keys design of sunk rectangular key, woodruff key. Effect of keyways on shaft.
	09.11.2022	3.6 Design of coupling-muff, flange and bush pin type flexible
	11.11.2022	CLASS TEST -3
9 th	14.11.2022	INTERNAL ASSESSMENT
	15.11.2022	4. Design of levers.

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		4.1 Types of levers.
10 th	16.11.2022	4.2 Design of Rocker arm
	18.11.2022	4.3 Bellcrank lever
	21.11.2022	4.4 Hand lever
	22.11.2022	4.5 Pedals for rectangular cross-section & fulcrum Pin only.
	23.11.2022	CLASS TEST - 4
	25.11.2022	5. Design of chassis component 5.1 Design of cloth-single plate & mutiplate.
11 th	28.11.2022	5.2 Teeth calculation of gears for sliding mesh/ constant mesh gearbox of given data.
	29.11.2022	5.3 Design of semi elliptical leaf spring, helical spring-torsion & compression
	30.11.2022	CLASS TEST - 5
	02.12.2022	6. Design of engine components. 6.1 Data of engine specifications & calculation of cylinder dimensions for given power
12 th	05.12.2022	6.2 Design of cylinder head thickness & bolts.
	06.12.2022	6.3 Design of valve seat & valve lift.
	07.12.2022	6.4 Design of piston crown by bending strength & thermal considerations.
	09.12.2022	6.5 Design of piston rings & skirt length
13 th	12.12.2022	6.6 Design of piston pin for bearing, bending & shear considerations.
	13.12.2022	6.7 Design of connecting rod cross-section(I-section)
	14.12.2022	6.8 Design of big-end, cap & bolt.
	16.12.2022	6.9 Design of overhung crankshaft.
14 th	19.12.2022	CLASS TEST - 6
	20.12.2022	REVISION
	21.12.2022	REVISION