

LESSON PLAN

ORISSA SCHOOL OF MINING ENGINEERING KEONJHAR DEPARTMENT OF MECHANICAL ENGG

DISCIPLINE	SEMESTER	NAME OF THE FACULTY
MECHANICAL ENGG.	5th	NIHARIKA MOHANTA
SUBJECT/CODE	NO. OF PERIODS ALLOTTED IN A WEEK : 03	SEMESTER W.E.F.: 01.07.2026
DESIGN OF MACHINE ELEMENT/TH2		TO DATE : 5-11-2026
		NUMBER OF WEEKS : 15

LEARNING OUTCOMES:

After the completion of the course, the student shall be able to

CO-01 : Analyze various modes of failure of machine components under different loading conditions.

CO-02 : Design and prepare detailed part and assembly drawings of mechanical components.

CO-03 : Use design data books and relevant design codes effectively in component design.

CO-04 : Select appropriate standard components and specifications from manufacturer catalogs.

CO-05 : Create component and assembly drawings using CAD software

Month	Period	Date	Topics to be Covered
JULY	1	03-07-2026	UNIT I Introduction to Design: Machine Design philosophy and Procedures
JULY	2	08-07-2026	General Considerations in Machine Design;
JULY	3	08-07-2026	Types of loads, concepts of stress
JULY	4	10-07-2026	Strain, Stress – Strain Diagram for Ductile and Brittle Materials
JULY	5	15-07-2026	Types of Stresses; Bearing pressure Intensity; Crushing; Bending and Torsion
JULY	6	15-07-2026	Principal Stresses; Simple Numericals
JULY	7	22-07-2026	Creep strain and Creep Curve; Fatigue; S-N curve; Endurance Limit; Factor of Safety, Stress
JULY	8	22-07-2026	Use of design data book; Use of standards in design and preferred numbers series
JULY	9	24-07-2026	Properties of Engineering materials
JULY	10	29-07-2026	Designation of materials as per IS and introduction to International standards & advantages of standardization
JULY	11	29-07-2026	Theories of Elastic Failures; Principal normal stress theory;
AUGUST	12	31-07-2026	Maximum shear stress theory & Maximum distortion energy theory.
AUGUST	13	05-08-2026	UNIT II Design of simple machine parts: Design of Cotter Joint
AUGUST	14	05-08-2026	Design of Knuckle Joint
AUGUST	15	07-08-2026	Design of Turnbuckle
AUGUST	16	12-08-2026	Design of Levers Hand/Foot Lever & Bell Crank Lever;
AUGUST	17	12-08-2026	Design of C-Clamp, Off-set links;
AUGUST	18	14-08-2026	Overhang Crank; Arm of Pulley
AUGUST	19	19-08-2026	Antifriction Bearings: Classification of Bearings; Sliding contact & Rolling contact;
AUGUST	20	19-08-2026	Terminology of Ball bearings:
AUGUST	21	21-08-2026	Life Load relationship, Basic static load rating and Basic dynamic load rating, limiting speed;
SEPTEMBER	22	28-08-2026	Selection of ball bearings using manufacturer's catalogue.
SEPTEMBER	23	02-09-2026	UNIT III Design of Shafts: Types of Shafts; Shaft materials; Standard Sizes;
SEPTEMBER	24	02-09-2026	Design of Shafts (Hollow and Solid) using strength criteria;
SEPTEMBER	25	08-09-2026	Design of Shafts (Hollow and Solid) using rigidity criteria; ASME code of design for line shafts supported between bearings with one or two pulleys in between or one overhung pulley;
SEPTEMBER	26	08-09-2026	Design of keys Design of Sunk Keys; Effect of Key-ways on strength of shaft
SEPTEMBER	27	11-09-2026	Design of coupling: Design of Couplings – Muff Coupling,
SEPTEMBER	28	18-09-2026	Protected type Flange Coupling, Bush-pin type flexible coupling;
SEPTEMBER	29	23-09-2026	Design of Spur Gear :Spur gear design considerations;
SEPTEMBER	30	23-09-2026	Lewis equation for static beam strength of spur gear teeth; Power transmission capacity of spur gears in bending.

SEPTEMBER	31	25-09-2026	UNIT -IV Design of Power Screws: thread Profiles used for power Screws - Relative merits and demerits of each;
SEPTEMBER	32	30-09-2026	Torque required to overcome thread friction; Self-locking and overhauling property;
OCTOBER	33	30-09-2026	Efficiency of power screws; Types of stresses induced;
OCTOBER	34	07-10-2026	Design of Screw Jack; Toggle Jack.
OCTOBER	35	07-10-2026	Design of springs: Classification and Applications of Springs; Spring terminology; Materials and Specifications;
OCTOBER	36	09-10-2026	Stresses in springs; Wahl's correction factor;
OCTOBER	37	14-10-2026	Deflection of springs; Energy stored in springs;
OCTOBER	38	14-10-2026	Design of Helical, Tension and Compression springs subjected to uniform applied loads like I.C. engine valves
OCTOBER	39	16-10-2026	Weighing balance, Railway buffers ,Governor springs; Leaf springs: Construction and Application.
OCTOBER	40	28-10-2026	UNIT -V Design of Fasteners:Stresses in Screwed fasteners
OCTOBER	41	28-10-2026	Bolts of Uniform Strength
NOVEMBER	42	30-10-2026	Design of Bolted Joints subjected to eccentric loading
NOVEMBER	43	03-11-2026	Design of Parallel and Transverse fillet welds;
NOVEMBER	44	03-11-2026	Axially loaded symmetrical section; Merits and demerits of screwed and welded joints.
NOVEMBER	45	extra	Ergonomics & Aesthetic consideration in design:Ergonomics of Design: Man-Machine relationship;
		extra	Design of Equipment for control, environment & safety; Aesthetic considerations regarding shape, size, color & surface finish.

Mohanta
25/06/2026

Dr. Niharika Mohanta
Lect - 5-11 (Mech Engrg)