



GOVERNMENT POLYTECHNIC, NABARANGPUR
DEPARTMENT OF MECHANICAL ENGINEERING

Discipline:
**MECHANICAL
ENGG**

Semester:
5TH

Name of the Teaching Faculty: **Laxman Golarai**

Subject:
**DESIGN OF
MACHINE
ELEMENTS**

No. of
days/per
week class
allotted: 04

Semester From date: **01.08.2023** To Date:

No. of Weeks: 15

**COURSE
OUTCOMES**

CO1: Understand the standard procedure for design of machine elements
CO2: Understand the design of various fastening elements with their uses
CO3: Understand the function of shaft and keys and their uses in engineering applications
CO4: Design couplings used for power transmission
CO5: Design closed coiled helical spring

Week	Class Day	Theory/Practical Topics
1 ST	1 ST	Introduction to Machine design & its classification
	2 ND	State the types of loads, define stress and strain
	3 RD	State mechanical & physical properties of the material
	4 TH	Define working stress, yield stress, ultimate stress and Factor of safety, stress strain curve for M.S & C.I
2 ND	1 ST	Explain the different modes of failure of a material
	2 ND	Factors governing the design of machine elements
	3 RD	Describe design procedure
	4 TH	MCQ TEST
3 RD	1 ST	Define a joint and classify them
	2 ND	Types of welded joints, advantages of welded joints over other joints
	3 RD	Design of welded joints
	4 TH	Problem solving
4 TH	1 ST	Problem solving
	2 ND	Determine strength of welded joints for eccentric loads
	3 RD	Contd.
	4 TH	Problem solving
5 TH	1 ST	Problem solving
	2 ND	Explain types of riveted joints and types of rivets
	3 RD	Describe failure of riveted joints
	4 TH	Determine strength and efficiency of riveted joints.
6 TH	1 ST	Problem solving
	2 ND	Design riveted joints for pressure vessel
	3 RD	Problem solving
	4 TH	MCQ TEST
7 TH	1 ST	State function, size and materials of shafts
	2 ND	Design solid and hollow shafts based on strength and Rigidity
	3 RD	Contd.
	4 TH	Problem solving
8 TH	1 ST	Problem solving
	2 ND	State functions, types and material of keys
	3 RD	Describe failure of key & effect of keyway

9 TH	4 TH	Design rectangular key against shear and crushing failure
	1 ST	Design rectangular key using empirical relation
	2 ND	State specification of different types of keys as per I.S
	3 RD	Problem solving
10 TH	4 TH	MCQ TEST
	1 ST	Define coupling and state its types
	2 ND	State the requirements of a good shaft coupling
	3 RD	Design of sleeve or muff coupling
11 TH	4 TH	Problem solving
	1 ST	Design of clamp or compression coupling
	2 ND	Problem solving
	3 RD	MCQ TEST
12 TH	4 TH	State the function and uses of springs
	1 ST	Materials used for helical springs. its types
	2 ND	Standard size spring wire, Terms used in compression springs Stress in helical spring of a circular wire End connection for helical tension spring
	3 RD	Deflection of helical spring of circular wire
13 TH	4 TH	Surge in spring
	1 ST	Problem solving
	2 ND	Problem solving
	3 RD	Problem solving
14 TH	4 TH	QUIZ
	1 ST	Chapter 1 - Revision
	2 ND	Chapter 2 - Revision
	3 RD	Chapter 3 - Revision
15 TH	4 TH	Chapter 4 - Revision
	1 ST	Chapter 5 - Revision
	2 ND	Chapter 6 - Revision
	3 RD	REVISION
	4 TH	REVISION

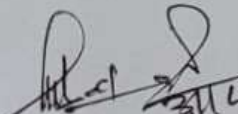
LEARNING RESOURCES:

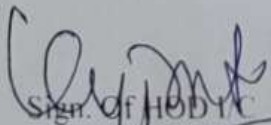
01. A textbook of Machine design by RS Khurmi and JK Gupta, S.Chand Publisher
02. Design of Machine elements by V.B. Bhandari, TMH
03. A textbook of Machine design by P.C. Sharma & D.K. Agarwal, S.K. Kataria & Sons
04. Design Data Handbook by S Md. Jalaludeen , Anuradha Publication

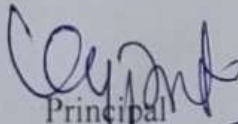
WEBSITE RESOURCES:

Sign. Of Faculty
concerned

Laxman Golare


Academic Co-ordinator
31/7/23


Sign. of HOD
31/7/23


Principal
31/7/23