

LESSON PLAN

SUB: MACHINE DESIGN

BRANCH:- MECHANICAL ENGG.

SEMESTER: 5TH

**NAME OF FACULTY: ER. SRI SABYASACHI
JAGANNATH MISHRA**



**GOVERNMENT POLYTECHNIC,
BHADRAK
SESSION:2025-26**

Hod ,Mechanical

Academic Co-ordinator

Principal
Govt. Polytechnic, Bhadrak

ACADEMIC LESSON PLAN FOR DESIGN OF MACHINE ELEMENTS (TH-2)

Discipline: MECHANICAL ENGG	Semester: 5th	Name of the Teaching Faculty:- SRI SABYASACHI JAGANNATH MISHRA.
Subject: MACHINE DESIGN	No. of days/per week class allotted: 04	SemesterFrom date : 14/07/2025To Date: 15/11/2025 No.ofWeeks: 15
Week	ClassDay	TheoryTopics
		Introduction
1 ST	1 ST	IntroductiontoMachineDesignandClassifyit.
	2 ND	Differentmechanicalengineeringmaterialsusedindesignwith their usesandtheirmechanicalandphysicalproperties
	3 RD	Differentmechanicalengineeringmaterialsusedindesignwit htheir usesandtheirmechanicalandphysicalproperties
	4 TH	Differentmechanicalengineeringmaterialsusedindesignwit htheir usesandtheirmechanicalandphysicalproperties
2 ND	1 ST	Differentmechanicalengineeringmaterialsusedindesignwit htheir usesandtheirmechanicalandphysicalproperties
	2 ND	Defineworkingstress,yieldstress,ultimatestress&fact orofsafetyand stress –straincurveforM.S&C.I. ModesofFailure(Byelasticdeflection, generalyielding&fracture)
	3 RD	Defineworkingstress,yieldstress,ultimatestress&fact orofsafetyand stress –straincurveforM.S&C.I. ModesofFailure(Byelasticdeflection, generalyielding&fracture)
	4 TH	Defineworkingstress,yieldstress,ultimatestress&factor ofsafetyandstress–straincurveforM.S &C.I. ModesofFailure(Byelasticdeflection,generalyielding& fracture)
3 RD	1 ST	Statethefactorsgoverningthedesignofmachine elements.
	2 ND	Describe designprocedure
	3 RD	Describe designprocedure
	4 TH	Discussion of PYQ
		Design of fastening elements
4 TH	1 ST	Joints and their classification.
	2 ND	State types of welded joints.
	3 RD	State advantages of welded joints over other joints.
	4 TH	Design of welded joints for eccentric loads.
5 TH	1 ST	Numerical on Welded Joint
	2 ND	Numerical on Welded Joint
	3 RD	State types of riveted joints and types of rivets.

	4 TH	Describe failure of riveted joints.
6 TH	1 ST	Determine strength & efficiency of riveted joints.
	2 ND	Design riveted joints for pressure vessel.
	3 RD	Numerical on Riveted Joint
	4 TH	Numerical on Riveted Joint
		Design of shafts and Keys
7 TH	1 ST	State the function and material of shafts.
	2 ND	Design solid & hollow shafts to transmit a given power at given rpm based on a) Strength: (i) Shear stress, (ii) Combined bending tension;
	3 RD	Design solid & hollow shafts to transmit a given power at given rpm based on b) Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
	4 TH	Numerical on above
8 TH	1 ST	Numerical on above
	2 ND	State standard size of shaft as per I.S, State function of keys, types of keys & material of keys
	3 RD	Describe failure of key, effect of key way.
	4 TH	Design rectangular sunk key considering its failure against shear & crushing
9 TH	1 ST	Design rectangular sunk key by using empirical relation for given diameter of shaft.
	2 ND	State specification of parallel key, gib-head key, taper key as per I.S.
	3 RD	Solve numerical on Design of Shaft and keys.
	4 TH	Solve numerical on Design of Shaft and keys.
		Design of Coupling:
10 TH	1 ST	Design of Shaft Coupling
	2 ND	Requirements of a good shaft coupling, Types of Coupling.
	3 RD	Design of Sleeve or Muff-Coupling
	4 TH	Design of Sleeve or Muff-Coupling
11 TH	1 ST	Numerical on above
	2 ND	Numerical on above
	3 RD	Design of Clamp or Compression Coupling.
	4 TH	Design of Clamp or Compression Coupling.
12 TH	1 ST	Design of Clamp or Compression Coupling.
	2 ND	Numerical on above
	3 RD	Numerical on above
	4 TH	Numerical on above
		Design a closed coil helical spring
13 TH	1 ST	Materials used for helical spring. Standard size spring wire. (SWG).
	2 ND	Terms used in compression spring.
	3 RD	Stress in helical spring of a circular wire.
	4 TH	Stress in helical spring of a circular wire.
14 TH	1 ST	Stress in helical spring of a circular wire.
	2 ND	Deflection of helical spring of circular wire.
	3 RD	Deflection of helical spring of circular wire.
	4 TH	Surge in spring.
15 TH	1 ST	Numerical on design of closed coil helical compression

		spring.
	2 ND	Numerical on design of closed coil helical compression spring.
	3 RD	Numerical on design of closed coil helical compression spring.
	4 TH	Numerical on design of closed coil helical compression spring.

Learning Resources:

01. Machine Design by Pandya & Shah, Charotar PP
02. A Textbook of Machine Design by R.S. Khurmi & J.K. Gupta, S. Chand
03. A Textbook of Machine Design by P.C. Sharma & D.K. Agrawal, S.K. Kataria
04. Design of Machine Elements by V.B. Bhandari, TMH
05. Design Data Book by S.M.D. Jalaudeen, Anuradha Publication

14/17/25

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