

Discipline Mining Engg	Semester 3 rd	Name of the Teaching faculty Rudra Mohan Nayak
Subject THU Mechanical operations in mine	No. of days Per week class allotted 04	Semester From date:- 15/07/2022 To date:- 21/01/2023 No. of weeks - 15
Week 1 st	class / Day 1 st	Theory Definition of Elasticity, Hook's law Limit of Proportionality
Week 2 nd	class / Day 2 nd	Theory Definition of Factor of safety, Lateral strain and Poisson's Ratio
Week 3 rd	class / Day 3 rd	Theory Stress-strain curve for ductile materials.
Week 4 th	class / Day 4 th	Theory The effect of axial load on bar of uniform section
Week 5 th	class / Day 1 st	Theory The effect of axial load on bar of variable section
Week 6 th	class / Day 2 nd	Theory Solve numerical problems on above
Week 7 th	class / Day 3 rd	Theory Bending moment and shear force
Week 8 th	class / Day 4 th	Theory Types of beam and types of loading
Week 9 th	class / Day 1 st	Theory SF & BM Diag for cantilever with concentrated loading
Week 10 th	class / Day 2 nd	Theory SF & BM Diag for cantilever with UD load over whole span

3 rd	SF & BM Dtg for simply supported beam with concentrated loading
4 th	SF & BM Dtg for simply supported beam with U.D.L over whole span.
1 st	Bending formula
2 nd	Definition of section modulus, section modulus of beam section of simple cases.
3 rd	Torsion and its effects.
4 th	Application of Torsion formula.
5 th	1 st working of shaft coupling such as hydraulic and magnetic coupling, Belt chain and rope drive
2 nd	working of simple and compound gear tooth, torque converters.
3 rd	function of flywheel and governors
4 th	working of watt, Porter and Porter governors.
6 th	Elements of Hydraulics
1 st	various fluid Properties, Pr. of fluid and Pr. head
2 nd	Pr. measuring device - Piezometer tube
3 rd	continuity equation explain.

4th

Explanation of Bernoulli's theorem

7th

1st

working of venturimeter

2nd

solve numerical problems on above

3rd

orifices

4th

the formula and discharge for rectangular orifices and problems solve.

8th

1st

Differentiate between orifice and notch

2nd

classification of notches

3rd

formula for discharge through notches & solve problem on above

4th

Laws of fluid friction

9th

1st

Loss of head due to friction (Darcy weisbach formula)

2nd

Hydraulic gradient and energy gradient

3rd

solve numerical problems as above

Compressed Air

4th

Introduction of compressed air as a power

10th

1st

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2nd

classification of compressor.

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	3 rd	Working Principle of Compressor
	4 th	-do-
11 th	1 st	Various methods of transmission of compressed air
	2 nd	-do-
	3 rd	Various methods of storage of compressed air
	4 th	-do-
12 th	1 st	Advantages of use of compressed air in mines
	2 nd	-do-
	3 rd	-do-
	4 th	Definition of Pneumatic machines.
13 th	1 st	Working Principle of Pneumatic machines.
	2 nd	-do-
	3 rd	-do-
IC Engines	4 th	I/C Engines
14 th	1 st	OTTO cycle

2nd

Solve problem on otto cycle

3rd

Diesel cycle

4th

Solve problem on Diesel cycle

15th

1st

Working principle of 2 stroke and 4 stroke petrol and diesel engines.

2nd

- do -

3rd

I.H.P, B.H.P & Mechanical efficiency of I/c Engine.

4th

various application of I/c Engines in mining field.

~~Ans~~
~~15/12/2022~~