FR. Conceicao Rodrigues College Of Engineering

Father Agnel Ashram, Bandstand, Bandra-west,
Mumbai-50

Department of Mechanical Engineering

B.E. (Mechanical) (semester VII) (2022-2023)

Lecture Plan

Subject: Design of mechanical Systems (MEC701) **Credits -04**

1. Syllabus.

Module	Contents	Hours
1.	Methodology & Morphology of design, Optimum design, system concepts in design.	03
2.	**Design of Transmission Gear Box:**	08
	Single stage andTwo stage Gear box with fixed ratio consisting of Design of spur, helical, bevel and worm and wormwheel gear pairs, Gear box housing layout and housing design.	
3.	**Design of Hoisting Mechanism:**	08
	Design of Snatch Block Assembly including Rope Selection, Sheave, Hook, Bearing for hook, cross piece, Axle for sheave and shackle plate, Design of rope drum, selection motor with transmission system.	
4.	**Design of Belt Conveyors :**	
	Power requirement, selection of belt, design of tension take up unit, idler pulley	04
5.	**Engine Design (Petrol and Diesel):**	
	Design of cylinder, Piston with pin and rings, connecting rod & crank shaft with bearings	08
6.	**Design of Pump:**	08
	5.1 Design of main components of gear pump.	
	1 Motor selection	
	2 Gear design	
	3 Shaft design and bearing selection	
	4 Casing and bolt design	
	5 Sizing of design of suction and delivery pipe	
	5.2 Design of main components of Centrifugal Pump:	
	1 Motor selection	
	2 Suction and Delivery pipe	
	3 Design of Impeller, Impeller shaft	
	4 Design of Volute Casing	

2. CO Statements.

Learner will be able to

MEC701.1. Apply the concept of system design.
MEC701.2. Select appropriate gears for power transmission on the basis of given load and speed
MEC701.3. Design material handling systems such as hoisting mechanism of EOT crane,
MEC701.4. Design belt conveyor systems
MEC701.5. Design engine components such as cylinder, piston, connecting rod and crankshaft
MEC701.6. Design pumps for the given applications

CO-PO-PSO Mapping.

CO# / PO#	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
MEC701.1	3	3	3	-	-	-	-	-	-	-	-	-
MEC701.2	3	3	3	-	-	-	-	2	-	-	-	-
MEC701.3	3	3	3	-	-	-	-	2	-	-	-	-
MEC701.4	3	3	3	-	-	-	-	2	-	-	-	-
MEC701.5	3	3	3	-	-	-	-	2	-	-	-	-
MEC701.6	3	3	3	-	-	-	-	2	-	-	-	-

CO# / PSO#	PSO1	PSO2
MEC701.1	-	-
MEC701.2	-	-
MEC701.3	-	-
MEC701.4	-	-
MEC701.5	-	-
MEC701.6	-	-

3. CO Assessment tools with target.

	Target for Assessment Tools		
	Unit Test	End Semester Exam	Course Exit Survey
MEC701.1	60%	40%	70%
MEC701.2	60%	40%	70%
MEC701.3	60%	40%	70%
MEC701.4	60%	40%	70%

MEC701.5	-	40%	70%
MEC701.6	-	40%	70%

4. Curriculum Gap/Content beyond syllabus (if any).

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5. Lecture/Lab/Mini Project/Assignment Plan.

Week	Durati on (Hrs.)	Topic	Modul e
1 (18.07.22 - 24.07.22)	4	Module 1 Methodology & Morphology of design, Optimum design, system concepts in design. Module 2 Design of Transmission Gear Box: Introduction	1 and 2
2 (25.07.22 - 31.07.22)	4	Module 2 Single stage and Two stage Gear box with fixed ratio consisting of Design of spur Gear box	2
3 (1.08.22 - 7.08.22)	4	housing layout and housing design	2
4 (8.08.22 - 14.08.22)	3	helical, bevel and worm and worm wheel gear pairs Design of Hoisting Mechanism: Design of Snatch Block Assembly including Rope Selection	2 and 3
5 (15.08.22 - 21.08.22)	3	Sheave, Hook, Bearing for hook, cross piece, Axle for sheave and shackle plate,	3
6 (22.08.22 - 28.08.22)	4	Design of rope drum, selection motor with transmission system. revision	3
7 (29.08.22 - 4.09.22)		Mid Term Break	
8 (5.09.22 - 11.09.22)		Unit Test – 1	
9 (12.09.22 - 18.09.22)	4	Design of Belt Conveyors : Power requirement, selection of belt, design of tension take up unit, idler pulley	4
10 (19.09.22 – 25.09.22)	4	Engine Design (Petrol and Diesel): Design of cylinder, Piston with pin and rings	5
11 (26.09.22 – 2.10.22)	4	connecting rod & crank shaft with bearings Design of Pump: 5.1 Design of main components of gear pump. 1 Motor selection 2 Gear design 3 Shaft design and bearing selection	6

12 (3.10.22 - 9.10.22)	3	4 Casing and bolt design 5 Sizing of design of suction and delivery pipe 5.2 Design of main components of Centrifugal Pump: 1 Motor selection 2 Suction and Delivery pipe	6
13 (10.10.22 - 16.10.22)	4	3 Design of Impeller, Impeller shaft 4 Design of Volute Casing Revision	6
14 (17.10.22 - 23.10.22)	**Unit Test - II**		