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Lesson Plan

Name of Faculty : Mohan Sharma, Assistant Professor
Discipline : Mechanical Engg.
Semester : 5th
Subject : **ME- 309 L , INDUSTRIAL ENGINEERING**
Lesson Plan Duration: 14 weeks (from AUG, 2018 to DEC, 2018)
Work Load (Lectutre/Practical) per week (in hours): **Lectures 03 hours**,

week	Lecture Day	Topic (Including Assignment/Test)
1st	1	Introduction to plant layout
	2	Objectives of good plant layout, importance of plant layout
	3	Types of plant layout
2nd	4	Advantages and limitations of different types of layout
	5	Function of material handling,
	6	Principles of material handling
3rd	7	Material handling devices ,
	8	Relation between plant layout and material handling
	9	Work Study Definition and scope of work study
4th	10	Need and advantage of work study
	11	Techniques of work study
	12	Work study and mesurement
5th	13	Work study and productivity
	14	Objectives and procedure for Method analysis
	15	Process chart symbols
6th	16	Flow diagram, string diagram
	17	Therblig and multiactivity charts
	18	Assignments-I
7th		**1st Minor Test**
8th	19	Work Measurement Objectives;
	20	Basic procedure for time study,
	21	Difference between time study and motion study
9th	22	Various time estimates and production standard
	23	Level of performances and allowances
	24	Various time recording techniques in time study,
10th	25	Types of value concept of value engineering
	26	Phases of value engineering studies
	27	Application of value egineering
11th	28	Concept of ergonomics
	29	Objectives of ergonomics
	30	Man machine system interface
12th	31	Anthropometry
	32	Ergonomics and safety
	33	Ergonomics and fatigue
13th	34	Intellectual property rights Patents,
	35	Trade marks, copy rights law of contract
	36	Assignments-II
14th		**2nd Minor Test**

Lesson Plan

Name of Faculty : Mr. Jagjeet Singh
Discipline : Mechanical Engineering
Semester : 5th
Subject : ICGT(ME- 307)
Lesson Plan Duration: 15 weeks (from August, 2018 to November, 2018)
Work Load (Lecture/Practical) per week (in hours): **Lectures 04 hours**.

Week	Theory		Practical	
	Lecture Day	**Topic (Including Assignment/Test)**	**Week**	**Topics**
1st	1	Internal and external combustion engines	1	To study the constructional details & working principles of two-stroke/ four stroke petrol engine
	2	Classification of I.C. Engines		
	3	Cycles of operation in four stroke and two stroke I.C. Engines, Wankel Engines		
	4	Assumptions made in air standard cycle; Otto cycle; diesel cycle, dual combustion cycle		
2nd	5	Comparison of Otto, diesel and dual combustion cycles	2	To study the constructional detail & working of two-stroke/ four stroke diesel engine.
	6	Sterling and Ericsson cycles; air standard efficiency, specific work output,		
	7	Specific weight; work ratio; mean effective pressure; deviation of actual engine		
	8	Problems and Solutions		
3rd	9	Mixture requirements for various operating conditions in S.I. Engines	3	Analysis of exhaust gases from single cylinder/multi cylinder diesel/petrol engine by Orsat
	10	Elementary carburetor, Requirements of a diesel injection system		
	11	Types of inject systems; petrol injection		
	12	Requirements of ignition system		
4th	13	Types of ignition systems ignition timing; spark plugs.	4	. To prepare heat balance sheet on multi-cylinder diesel engine/petrol engine.
	14	S.I. engines; Ignition limits; stages of combustion in S.I. Engines		
	15	Ignition lag; velocity of flame propagation; detonation;		
	16	Effects of engine variables on detonation; theories of detonation		
5th	17	Octane rating of fuels; preignition; S.I. engine combustion chambers	5	.To find the indicated horse power (IHP) on multi-cylinder petrol
	18	Stages of combustion in C.I.		

		Engines; delay period;		engine/diesel engine by Morse Test.
	19	Variables affecting delay period; knock in C.I. engines	6	**Viva- Voice -1**
	20	Cetane rating; C.I. engine combustion chambers.		
6th	21	Functions of a lubricating system, Types of lubrication system	7	To prepare variable speed performance test of a multi-cylinder/single cylinder petrol engine/diesel engine and prepare the curves (i) bhp, ihp,fhp, vs speed (ii) volumetric efficiency&indicated specific fuel consumption vs speed.
	22	Mist, wet sump and dry sump systems		
	23	Properties of lubricating oil; SAE rating of lubricants		
	24	Engine performance and lubrication		
7th	----------**Ist Minor Test**----------			
8th	25	Necessity of engine cooling; disadvantages of overcooling	8	To find fhp of a multi-cylinder diesel engine/petrol engine by Willian's line method & by motoring method
	26	Cooling systems; aircooling, water cooling; radiators		
	27	Performance parameters: BHP, IHP		
	28	Mechanical efficiency, brake mean effective pressure and indicative mean effective pressure		
9th	29	Torque, volumetric efficiency	9	To perform constant speed performance test on a single cylinder/multi-cylinder diesel engine & draw curves of (i) bhp vs fuel rate, air rate and A/F and (ii) bhp vs mep, mech efficiency & sfc
	30	Specific fuel consumption		
	31	Thermal efficiency; heat balance; Basic engine measurements;		
	32	Problems and Solutions		
10th	33	Fuel and air consumption, brake power, indicated power and friction power	10	To measure CO & Hydrocarbons in the exhaust of 2- stroke / 4-stroke petrol engine
	34	Heat lost to coolant and exhaust gases; performance curves		
	35	Pollutants from S.I. and C.I.Engines,		
	36	Methods of emission control		
11th	37	Alternative fuels for I.C. Engines	11.	To find intensity of smoke from a single cylinder / multi-cylinder diesel engine.
	38	The current scenario on the pollution front		
	39	Root and vane blowers		
	40	Static and total head values		
12th	41	Centrifugal compressors- Velocity diagrams	12.	To draw the scavenging characteristic curves of single cylinder petrol engine.
	42	Slip factor, ratio of compression		
	43	Pressure coefficient, pre-whirl		
	44	Axial flow compressor- Degree of reaction		
13th	45	Polytropic efficiency		To study the effects of secondary air

	46	Surging, choking and stalling	13	flow on bhp, sfc, Mech. Efficiency & emission of a two-stroke petrol engine
	47	Performance characteristics,		
	48	Problems and Solutions		
14th	----------**2nd Minor Test**----------			
15th	49	Brayton cycle; Components of a gas turbine plant	15	**Viva- Voice -2**
	50	Open and Closed types of gas turbine plants; Optimum pressure ratio		
	51	Improvements of the basic gas turbine cycle; multi stage compression with inter-cooling; multi stage expansion with reheating between stages		
	52	Exhaust gas heat exchanger, Applications of gas turbines. Problems		

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Lesson Plan

Name of Faculty : Mohan Sharma, Assistant Professor
Discipline : Mechanical Engg.
Semester : 5th
Subject : **ME- 301 L, Kinematics of Machines**
Lesson Plan Duration: 14 weeks (from AUG, 2018 to DEC, 2018)
Work Load (Lectutre/Practical) per week (in hours): **Lectures 04 hours**,

week	Lecture Day	Topic (Including Assignment/Test)
1st	1	Introduction mechanism and machine
	2	Kinematics link ,kinematics chain, kinematics pairs
	3	Degree of freedom ,kinematic inversion
	4	Inversions of four bar chain
2nd	5	Inversions of single slider kinematic chain
	6	Inversions of double slider kinematic chain
	7	problems
	8	Pantograph, straight-line motion mechanisms (Peculiar, Hart, Scott Russell
3rd	9	Grasshopper, Watt, Kemp's Tchybishev
	10	Indicator mechanisms (Simplex Crosby , Thomson, etc
	11	Automobile steering gears (Davis and Ackerman),Hooks joint (universal coupling), Double hooks joints
	12	Types of cams and followers, various motions of the follower
4th	13	Displacement diagram
	14	Construction of cam profiles
	15	problems
	16	Analysis for velocities and accelerations of tangent and circular arc cams with roller and flat –faced followers
5th	17	Introduction to function generation, Path generation and rigid bodied guidance
	18	Synthesis for four bar linkage
	19	Design of four bar mechanisms
	20	Design of single slider kinematic mechanisms
6th	21	Problems
	22	Problem
	23	problems
	24	Assignment-I
7th		**1st Minor Test**
8th	25	Introduction to gear ,law of gearing
	26	Types of gears, terminology
	27	Condition for correct gearing, cyclical and involutes profiles of gear teeth
	28	Pressure angle, path of contact
9th	29	Arc of contact, Interference
	30	Undercutting, minimum number of teeth
	31	Number of pairs of teeth in contact, helical, spiral, worm and worm gear, bevel gear
	32	Gear trains; simple, compound, reverted
10th	33	Epicyclical, Solution of gear trains, sun and planet gear
	34	Bevel epicyclical gear, compound epicyclical gear
	35	Differential of automobile
	36	Torque in gear trains
11th	37	Velocity in mechanisms
	38	Velocity determination; Relative velocity methods
	39	Velocity in a slider crank mechanism instantaneous centre method

	40	Velocity of a point on a link by instantaneous centre method
12th	41	Method of locating instantaneous centres in mechanisms
	42	problems
	43	Acceleration diagram for a link, Acceleration of a point on a link
	44	Acceleration in single slider crank mechanism
13th	45	Instantaneous centre method Acceleration determination
	46	Cariole's component of acceleration, Klein's and other constructions
	47	problems
	48	Assignment-II
14th		**2nd Minor Test**

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Lesson Plan

Name of Faculty : Pawan Kumar, Assistant Professor
Discipline : Mechanical Engg.
Semester : 5th
Subject : Fluid Machines Lab
Lesson Plan Duration: 15 weeks (from August, 2018 to Dec, 2018)
Work Load (Lecture) per week (in hours): **Lectures 08 hours**

Week	Theory		Actual Lesson Plan Covered	
	Lecture Day	Topic (Including Assignment/Test)	Week	Topic
1st	1	To study the constructional details of a Pelton turbine and draw its fluid flow circuit.	1st	
2nd	2	To draw the following performance characteristics of Pelton turbine-constant head,constant-speed and constant efficiency curves.	2nd	
3rd	3	To study the constructional details of a Francis turbine and draw its fluid flow circuit.	3rd	
4th	4	To draw the constant head, constant speed and constant efficiency performance characteristics of Francis turbine.	4th	\
5th	5	To study the construction details of a Kaplan turbine and draw its fluid flow circuit.	5th	
6th	6	To draw the constant head, speed and efficiency curves for a Kaplan turbine.	6th	
7th		**1st Minor Test**		
8th	7	To study the constructional details of a Centrifugal Pump and draw its characteristic curves.	8th	
9th	8	To study the constructional details of a Reciprocating Pump and draw its characteristics curves.	9th	
10th	9	To study the construction details of a Gear oil pump and its performance curves.	10th	
11th	10	To study the constructional details of a Hydraulic Ram and determine its various efficiencies.	11th	
12th	11	To study the constructional details of a Centrifugal compressor.	12th	
13th	12	To study the model of Hydro power plant and draw its layout.	13th	
14th		**2nd Minor Test**		
15th	14	Viva	15th	

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Lesson Plan

Name of Faculty : Pawan Kumar, Assistant Professor
Discipline : Mechanical Engg.
Semester : 5th
Subject : Fluid Machines
Lesson Plan Duration: 15 weeks (from August, 2018 to Dec, 2018)
Work Load (Lecture) per week (in hours): **Lectures 04 hours**

Week	Theory		Actual Lesson Plan Covered	
	Lecture Day	Topic (Including Assignment/Test)	Week	Topic
		Unit-I		
1st	1	Impact of free jets: Impulse – momentum principle, jet impingement - on a stationary flat plate	1st	
	2	Inclined plate and a hinged plate, at the centre of a stationary vane, on a moving flat plate		
	3	Inclined plate, a moving vane and a series of vanes, Jet propulsion of ships		
	4	Problem and solutions		
2nd	5	Impulse Turbines: Classification – impulse and reaction turbines, water wheels, component parts	2nd	
	6	Construction, operation and governing mechanism of a Pelton wheel,		
	7	work done, effective head, available head and efficiency of a Pelton wheel		
	8	Problem and solutions		
3rd	9	Design aspects, speed ratio	3rd	
	10	Flow ratio, jet ratio, number of jets		
	11	Number of buckets and working proportions		
	12	Problem and solutions		
4th	13	Performance Characteristics	4th	\
	14	Governing of impulse turbines		
	15	Problem and solutions		
	16	Assignment-I		
		Unit-II		
5th	17	Francis Turbines: Component parts, construction and operation of a Francis turbine	5th	
	18	Mechanism, work done by the turbine runner		
	19	Working proportions and design parameters		
	20	Problem and solutions		
6th	21	Slow, medium and fast runners	6th	
	22	Degree of reaction, inward/outward flow reaction turbines, Performance Characteristics		
	23	Component parts, construction and operation of a Propeller, Kaplan turbine		
	24	Problem and solutions		
7th		**1st Minor Test**		
8th	25	Differences between the Francis and Kaplan turbines, draft tube - its function and different forms	8th	
	26	Performance Characteristics, Governing of Kaplan turbine,		
	27	Introduction to new types of turbine, Deriaz (Diagonal), Bulb, Tubular turbines		
	28	Problem and solutions		
		Unit-III		
9th	29	Centrifugal Pumps: Classification, velocity vector diagrams and work done, manometric efficiency, vane shape, head	9th	
	30	Capacity relationship and pump losses**,** pressure rise in impeller minimum starting speed		
	31	Design considerations, multistage pumps		
	32	Problem and solutions		
	33	Similarity relations and specific speed net positive suction head		

10th	34	Construction and operational details, discharge coefficient, volumetric efficiency and slip	10th	
	35	Work and power input, effect of acceleration and friction on indicator diagram (pressure – stroke length plot),		
	36	Problem and solutions		
11th	37	Separation, air vessels and their utility, rate of flow into or from the air vessel	11th	
	38	Maximum speed of the rotating crank, characteristic curves, centrifugal vs. reciprocating pumps		
	39	Brief introduction to screw, gear, vane and radial piston pumps,		
	40	Problem and solutions		
Unit IV				
12th	41	Dimensional homogeneity, Rayleigh's method and Buckingham's π-theorem,	12th	
	42	Model studies and similitude, dimensionless numbers and their significance.		
	43	Unit quantities, specific speed model relationships for turbines,		
	44	Problem and solutions		
13th	45	Scale effect, cavitation – its causes, harmful effects and prevention, permissible installation height	13th	
	46	Function, construction and operation of Hydraulic accumulator,		
	47	Problem and solutions		
	48	Assignment-II		
14th		**2nd Minor Test**		
15th	49	Hydraulic intensifier, hydraulic crane	15th	
	50	Hydraulic lift and hydraulic press,		
	51	Fluid coupling and torque converter, Hydraulic ram		
	52	Problem and solutions		

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