

Lesson Plan

Name of the Faculty Mr. Kitab Singh
Discipline Mechanical Engineering
Semester 4rd Semester
Subject Production Technology-I (ME-202N)
Lesson Plan Duration: 15 weeks (from January, 2019 to April, 2019)

Week	Theory	
	Lecture Day	Topic (including assignment / test)
1 st	1 st	Introduction, Geometry of single point turning tools
	2 nd	Cutting edges, Rake and Clearance angles
	3 rd	Systems of description of tool geometry, Designation of tool geometry in Machine reference system
	4 th	ORS system and NRS system
2 nd	5 th	Geometry of Multi point cutting tools: Geometry of Milling cutters, Geometry of Drills
	6 th	Cutting Tool Materials, Chip formation, Types of Chips, Chip control and chip breakers
	7 th	orthogonal and oblique metal cutting, Chip thickness ratio, Velocity relationship in orthogonal cutting
	8 th	Assignment 1
3 rd	9 th	Test-1
	10 th	Merchant's Analysis, Stress and Strain on the chip, Forces on single point cutting tool
	11 th	Torque, heat produced, power and MRR equations
	12 th	Use of Merchant's circle diagram in force analysis in orthogonal cutting for single point cutting tool.
4 th	13 th	Popular theories on mechanics of metal cutting: Earnst Merchant Theory, Merchant theory
	14 th	Stabler Theory, Lee and Shaffer's Theory. Factors affecting temperature in metal cutting
	15 th	Cutting fluids, Purpose, Properties, Types of lubricants, Types of cutting fluids
	16 th	Tool Failure, Mechanisms of Tool wear, Tool Life, Factors affecting tool life. Taylor's Tool life equation
5 th	17 th	Cost Considerations in Manufacturing, Elements of Machining cost, Minimum cost per piece,
	18 th	Maximum Production rate, Optimum cutting speed and optimum tool life for minimum cost of production and maximum production rate,
	19 th	Machinability, Machinability Index, Improving Machinability, Measurement of cutting forces, Tool force Dynamometers, Numerical on Mechanics of Metal cutting and economics.
	20 th	Assignment 2
6 th	21 st	Test-2
	22 nd	Milling Machine Operations performed on Milling machine, Parts of Milling Machine
	23 rd	Types of Milling machines, fundamentals of Milling process, Milling Cutters
	24 th	Elements of Plain Milling cutter, Cutter Holing devices, Cutting speed, Feed and depth of cut
7 th	25 th	Force system in Milling, Dividing head or Indexing Head, Methods of Indexing
	26 th	Types of Drills, Drilling machine Types, Drilling machine operations,

	27 th	Size of Drilling machine, Main parts of drilling machine
	28 th	Force system in Drilling, Cutting speed, Feed and Depth of cut in drilling
8 th	29 th	MRR in drilling
	30 th	Numerical Problems on Drilling
	31 st	Revision
	32 nd	Assignment 3
9 th	33 rd	Test-3
	34 th	Introduction, purpose of machine tool specifications
	35 th	Methods of specification of conventional machine tools: specification of lathes
	36 th	specification of drilling and boring machines, specification of shaper, planer and slotter machines
10 th	37 th	specification of milling machine, specification of gear teeth generating machines
	38 th	specification of grinding machines
	39 th	Measurements, Linear Measurement
	40 th	Callipers, Vernier Calliper, Micrometer
11 th	41 st	Angular Measurement
	42 nd	Comparators-mechanical, electrical and optical, sine bar
	43 rd	Revision
	44 th	auto-collimator
12 th	45 th	Surface finish and its measurement
	46 th	Surface Roughness Measurement methods
	47 th	Factors affecting surface finish in machining,
	48 th	micro and macro deviation
13 th	49 th	Specifying surface finish.
	50 th	Class test of unit 1
	51 st	Class test of unit 2
	52 nd	Class test of unit 3
14 th	53 rd	Class test of unit 4
	54 th	Revision
	55 th	Assignment 4
	56 th	Test-4
15 th	57 th	Revision
	58 th	Revision
	59 th	Revision
	60 th	Test (Whole Syllabus)

Lesson Plan

Name of the Faculty Mr.Manvir Singh

Discipline Mechanical Engineering

Semester 4th Semster

Subject Steam Generation & Power (ME-204N)

Steam Generation & Power Lab (ME-218N)

Lesson Plan Duration: 15 weeks (from January, 2019 to April, 2019)

**** Work**

Week	Theory		Practical	
	Lecture Da	Topic (Including Assignment/ Test)	Practical Da	Topic
1	1st	Introduction to Subject	1st	To study the Babcock-Wilcox boiler (Model)
	2nd	Classification of boilers; comparison of fire tube and water tube boiler: their advantages		
	3rd	Description of boiler; Lancashire		
2	4th	locomotive; Babcock; Wilcox	2nd	To study the locomotive boiler (Model)
	5th	Boiler mountings; stop valve; safety valve; blow off valve; feed check etc.; water level indicator; fusible		
	6th	Boiler accessories; feed pump; feed water heater; preheater; superheater; economizer		
3	7th	Natural draught chimney design; artificial draught; mechanical draught	3rd	To study the Lancashire boiler (Model)
	8th	Stream jet draught; calculation of boiler efficiency and equivalent evaporation		
	9th	Numerical on chimney height, boiler efficiency and equivalent evaporation		
4	10th	Assignment No.1		
	11th	Carnot cycle; simple Rankine cycle		
	12th	Modified Rankine cycle		
5	13th	Reheating Rankine cycle	4th	To study the Cochran boiler (Model)
	14th	Regenerative Rankine cycle		
	15th	Effect of operating parameters on rankine cycle performance; effect of superheating; effect of		
6	16th	Types of feed water heater	5th	To study the Cornish boiler (Model)
	17th	Reheat factor; Binary vapour cycle		
	18th	Simple steam engine, function of various components		
7	19th	Compound Steam engine; function of various components		
1 st Sessional	20th	Assignment 2		
	21st	Revision 1 st and 2 nd Unit		
8	22nd	Function of steam nozzle; shape of nozzle	6th	To study various parts of the vertical steam engine
	23rd	Variation of velocity; area of specific volume		
	24th	Steady state energy equation; continuity equation		
9	25th	Nozzle efficiency; critical pressure ratio for maximum discharge	7th	To study the various mountings and accessories of a boiler
	26th	Physical explanation of critical pressure		
	27th	Super saturated flow of steam; design of steam nozzle		

10	28th	Advantage of steam condensation; component of steam condensing plant	8th	To study cooling tower and find its efficiency
	29th	Types of condensers		
	30th	Air leakage in condensers; Dalton's law of partial pressure; vacuum efficiency		
11	31st	Calculation of cooling water requirement; air expansion num		
	32nd	Assignment 3		
	33rd	Introduction; classification of steam turbine; impulse turbine; working principle		
12	34th	Velocity diagram; calculation of power output and efficiency		
2 nd Sessional	35th	Revision 3 rd Unit		
	36th	Maximum efficiency of a single stage impulse turbine		
13	37th	Compounding of impulse turbine	9th	To study and find volumetric efficiency of a reciprocating air
	38th	Numerical on Impulse Turbine		
	39th	Impulse reaction turbine; working principle; degree of reaction; parsons turbine; velocity diagram		
14	40th	Calculation of power output; efficiency of blade height; condition of maximum efficiency		
	41st	Numerical on reaction Turbine		
	42nd	Internal losses in steam turbine		
15	43rd	Governing of steam turbine		
	44th	Assignment 4		
	45th	Revision 4 th Unit		

Name of the Faculty- Mr. Lahna Singh

Discipline - Mechanical Engineering

Semester - 4TH Semster

Subject and Code - Mechanics of solids-2(ME 206N)

Lesson Plan Duration - 15 weeks (January,2019 to April, 2019)

Week	Theory	
	Lecture Day	Topic (Including Assignment/ Test)
1	1st	Introduction to Subject Strain Energy
	2nd	Impact Loading: Definitions,
	3rd	expressions for strain energy stored in a body when load is applied (i) gradually, (ii) suddenly and (iii) with impact
2	4th	strain energy of beams in bending
	5th	beam deflections
	6th	strain energy of shafts in twisting,
3	7th	energy methods in determining spring deflection, Castigliano's theorem
	8th	Theories of Elastic Failure: Various theories of elastic failures with derivations and graphical representations
	9th	Numerical on Deflection and strain Energy
4	10th	applications to problems of 2- dimensional stress system with (i) Combined direct loading and bending, and Numericals
	11th	(ii) combined torsional and direct loading
	12th	Numericals
5	13th	Thin Walled Vessels: Hoop & Longitudinal stresses
	14th	Strains in cylindrical & spherical vessels
	15th	Derivations under internal pressure, wire wound cylinders
6	16th	Numericals.
	17th	Thick Cylinders & Spheres: Derivation of Lamé's equations
	18th	radial & hoop stresses and strains in thick,
7	19th	compound cylinders and spherical shells subjected to internal fluid pressure only,
	20th	hub shrunk on solid shaft
	21st	Numericals.
8	22nd	Introduction on Rotating Rims & Discs
	23rd	rotating discs of uniform strength
	24th	stresses in (I) rotating rims, neglecting the effect of spokes,
9	25th	(ii) rotating cylinders, hollow cylinders & solids cylinders. Numericals
	26th	Springs: Stresses in closed coiled helical springs,
	27th	Stresses in open coiled helical spring subjected to axial loads and twisting couples
10	28th	leaf springs, concentric springs,
	29th	flat spiral springs
	30th	Numericals
11	31st	Bending of Curved Bars
	32nd	Stresses in bars of initial large radius of curvature
	33rd	bars of initial small radius of curvature, stresses in crane hooks.
12	34th	stresses in crane hooks.
	35th	rings of circular & trapezoidal sections
	36th	deflection of curved bars & rings.
13	37th	deflection of rings by Castigliano's theorem,
	38th	stresses in simple chain link, deflection of simple chain links,
	39th	Problems
14	40th	Unsymmetrical Bending;
	41st	Introduction to unsymmetrical bending, stresses due to unsymmetrical bending,.
	42nd	Deflection of beam due to unsymmetrical bending,.
15	43rd	shear center for angle, channel, and I-sections, Numericals
	44th	Tutorial Sheet no
	45th	Test- Whole Course

Name of the Faculty- Mr.Jasbir Singh

Discipline - Mechanical Engineering

Semester - 4TH Semester

Subject and Code - Fluid Mechanics (ME-208N)

Lesson Plan Duration - 15 weeks (January,2019 to April, 2019)

Week	Theory		
	Lecture Day	Topic (Including Assignment/ Test)	Practical Day
1	1st	Introduction to Subject ,Concept of fluid and flow	1st
	2nd	ideal and real fluids, continuum concept, Properties of fluid mass density, weight density, specific volume,	
	3rd	capillarity, vapour pressure, compressibility and bulk modulus	
	4th	Newtonian and non-Newtonian fluids	
2	5th	Fluid Statics,Pressure, Pascal's law, hydrostatic law, pressure measurement, manometers, hydrostatic forces	2nd
	6th	Buoyancy, stability of floating body	
	7th	submerged bodies, liquids in relative equilibrium. Problem	
	8th	Tutorial sheet No. 1	
3	9th	Problem and Discussion on Tutorial Sheet	3rd
	10th	Revision of Unit First	
	11th	Hydrostatic law and buoyancy.	
	12th	Numerical on Properties of fluid	
4	13th	Eulerian and Lagrangian description of fluid flow; types of fluid flows	
	14th	stream, streak and path lines; acceleration of a fluid particle, flow rate and continuity equation, differential	
	15th	rotation and vorticity, flow net.	
	16th	circulation, stream and potential functions,	
5	17th	Concept of system and control volume, Euler's equation	4th
	18th	Bernoulli's equation	
	19th	venturimeter, orificemeter	

	20th	its practical applications with Numerical	
6	21st	orifices, mouthpieces, Impulse momentum equation,	5th
	22nd	kinetic energy and momentum correction factors	
	23rd	Numerical on kinetic energy and momentum correction factors	
	24th	Tutorial sheet No 2.	
7	25th	Discussion on Tutorial Sheet	6th
	26th	First Sessional	
	27th		
	28th		
8	29th	Introduction on Viscous Flow	
	30th	Steady state energy equation	
	31st	Continuity equation	
	32nd	Flow regimes and Reynold's number	
9	33th	Navier-Stokes equation, relationship between shear stress and pressure gradient	7th
	34th	Flow of viscous fluids in circular pipe.	
	35th	Flow of between stationary Plates	
	36th	Moving parallel plates	
10	37th	Numerical study on Flow of viscous flow.	8th
	38th	Introduction on hydrodynamic lubrication	
	39th	movement of piston in a dashpot	
	40th	power absorbed in bearings	
11	41st	Numerical on power absorbed in bearings	
	42rd	Tutorial sheet no 3	
	43rd	Discussion on Tutorial sheet and Numericals.	
	44th	Boundary layer concept	
12	45th	Second Sessional	9th
	46th		

	47th		
	48th	Numerical on displacement, momentum and energy thickness	
13	49th	Von-Karman momentum integral equation	
	50th	laminar and turbulent boundary layer flows,	
	51st	Drag and lift, friction and pressure drag, lift and drag coefficients, stream lined and bluff bodies, drag on a flat	
	52nd	Separation of boundary layer and its control	
14	53rd	drag on a cylinder and an airfoil, circulation and lift on a circular cylinder and an airfoil;	
	54th	Transition from laminar to turbulent flow, Reynold's equation of turbulence, Shear stress in turbulent flow,	
	55th	hydraulic gradient and total energy lines, series and parallel connection of pipes,	
	56th	branched pipes equivalent pipe	
15	57th	power transmission through pipes, hydraulically smooth and rough pipes,	
	58th	velocity distribution in pipes, friction coefficients for smooth and rough pipes	
	59th	Tutorial Sheet no 4	
	60th	Test- Whole Course	

To verify the Bernoulli's Theorem
To determine coefficient of discharge of an orifice meter.
To determine the coefficient of discharge of venturimeter
To find critical Reynolds number for a pipe flow
To determine the coefficient of discharge of Notch (V and Rect.

Name of the Faculty- Mr. Neeraj Vashishth
 Discipline- Mechanical Engineering
 Semester - 4th Semester
 Subject and Code - Dynamics of Machines (ME-210N) & Dynamics of Machines Lab (ME-216N)
 Lesson Plan Duration - 15 weeks (January,2019 to April, 2019)

Week	Theory		Practical	
	Lecture Day	Topic (Including Assignment/ Test)	Practical Day	Topic
1	1st	Introduction to Subject	1st	Introduction (Group I)
	2nd	Static equilibrium, Equilibrium of two and three force member, Members with two forces and a torque		
	3rd	Assignment No.1		
2	4th	Equilibrium of four force members, free body diagram, Principle of Superposition,	2nd	To determine experimentally, the moment of inertia of a flywheel and axle compare with theoretical values.
	5th	static forces Analysis of four bar mechanisms and slider crank mechanism		
	6th	Test No.1		
3	7th	D'Alembert's principle, Equivalent offset inertia force, Dynamic force analysis of four bar mechanism and slider crank mechanism Engine force analysis,	3rd	To find out critical speed experimentally and to compare the whirling speed of a shaft with theoretical values.
	8th	Turning moment on crank shaft, Dynamic Equivalent systems, Inertia of connecting rods		
	9th	Assignment No.2		
4	10th	Inertia force in reciprocating engines(Graphical and Analytical methods),	4th	To find experimentally the Gyroscopic couple on motorized gyroscope and compare with applied couple.
	11th	Turning moment diagrams, fluctuation of energy, Flywheels, Flywheel dimensions, Punching Press		
	12th	Classification of gears, Gear terminology, Fundamental law of gearing		
5	13th	Forms of Teeth, Cycloidal and involutes profiles of gear teeth, Interchangeable Gears, path of contact	5th	To perform the experiment of balancing of rotating parts and finds the unbalanced couple and forces.
	14th	arc of contact, number of pairs of teeth in contact (Contact Ratio), Interference in involute gears, minimum number of teeth, undercutting,		
	15th	Assignment No.3		
6	16th	Helical, Spiral, Bevel and worm & worm gears, Terminology, Efficiency	6th	Viva-voce
	17th	Simple, compound, reverted, Planetary or epicyclic gear trains,		
	18th	Analysis of Epicyclic Gear trains, Torques in epicyclic gear trains		
7	19th	Test 2	7th	To determine experimentally the unbalance forces and couples of reciprocating parts.
	20th	Sun and Planet gear, Automotive transmissions gear train. Differential.		
	21st	Types of brakes, Block and shoe brake, band brake, band and block brakes		
8	22nd	Internal expanding shoe brake, Effect of Braking.	8th	To calculate the torque on a planet carrier and torque on internal gear using epicyclic gear train and holding torque apparatus
	23rd	Assignment 4		
	24th	Types of Dynamometers, Pony and Rope Brake Dynamometer		
9	25th	Hydraulic Dynamometer, Belt Transmission Dynamometer	9th	To study the different types of centrifugal and inertia governors and demonstrate any one.
	26th	Test 3		
	27th	Epicyclic train Dynamometer, Bevis Gibson torsion dynamometer		
10	28th	Types of Governors, Watt, Porter, Proell,	10th	To study the automatic transmission unit.
	29th	Hartnell, Hartung, Wilson-Hartnell, Inertia Governors		
	30th	Sensitiveness, Hunting, Isochronism		
11	31st	Stability of Governors, Effort and Power of a Governor, Controlling Force.	11th	To study the differential types of brakes
	32nd	Static and Dynamic Balancing, Single Rotating mass,		
	33rd	Many Masses rotating in same plane and in different planes		
12	34th	Analytical method for balancing of rotating masses	12th	To determine radius of gyration of given bar using Bifilar Suspension
	35th	Test 4		
	36th	Reciprocating Engine, Partial Primary balance		
13	37th	Balancing of Multi-cylinder in line engines, Balancing of Radial Engines	13th	Revision
	38th	Balancing of V-Engines, Balancing of Rotors		
	39th	Angular Velocity, Angular Acceleration, pitching and rolling		
14	40th	Gyroscopic couple and its effect on Aero planes, Naval ships	14th	Revision
	41st	Stability of an automobile (2 & 4-wheers), taking a turn, Gyroscopic effect in stone crusher		
	42nd	Assignment 4		
15	43rd	Revision	15th	Internal Viva-voce
	44th	Revision		
	45th	Test- full Course		

Name of the Faculty-

Discipline -

Semester -

Subject and Code -

Lesson Plan Duration - 15 weeks (Ja

Week	Lecture Day
1	1st
	2nd
	3rd
2	4th
	5th
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3	7th
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14	40th
	41st
	42nd
15	43rd
	44th
	45th

Mr. Satish Verma

Mechanical Engineering

4th Semester

ENERGY STUDIES (MPC-202N)

(January, 2019 to April, 2019)

Theory	
Topic (Including Assignment/ Test)	Practical Day
Introduction	1st
Types of energy	2nd
Conversion of various forms of energy	3rd
Conventional and non conventional source	4th
Need for non conventional energy based power generation	5th
Assignment No.1	6th
Introduction to energy management	7th
General principle of energy management	8th
Energy management strategy	9th
Introduction to energy audit	10th
Need of energy audit	11th
Types ,mythology and approach	12th
Conventional energy sources	13th
Site selection and working of thermal power plant	14th

Site selection and working of Hydro power plant	15th
Site selection and working of Nuclear power plant	16th
Site selection and working of diesel power plant	17th
Advantage and disadvantage of various power plant	18th
Non conventional energy sources	19th
Basic principle and site selection of solar energy power plant	20th
Photovoltaic technologies	21st
Photovoltaic system and components	22nd
Wind energy power plant	23rd
Bio energy plants	24th
Geothermal energy plants	25th
Assignment 2	26th
Tidal power plant	27th
MHD	28th
Energy scenario	29th
Test-1	30th
Layout of power system	31st
Role of energy in economic development	32nd
Energy demand	33rd
Availability of energy	34th
Assignment-3	35th
Consumption of energy	36th
Commercial and non commercial energy	37th
Test-2	38th
Indian energy scenario	39th

Long term energy scenario	40th
Energy pricing, energy sector reforms in India	41st
Assignment-4	42nd
Energy strategy for the future	43rd
Revision	44th
Test- Whole Course	45th

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