



**SRK INSTITUTE OF TECHNOLOGY**  
**Enikepadu, Vijayawada 521108**  
 Approved by AICTE, Affiliated to JNTUK, Kakinada  
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**DEPARTMENT OF MECHANICAL ENGINEERING**

SRKIT / ME / 97

## TENTATIVE LESSON PLAN

**Course/Code:** FLUID MECHANICS & HYDRAULIC MACHINES / R2021032

**Year / Semester:** II/I

**Section:** 1

**A.Y:** 2023-24

S. No.	TOPIC	Date	Mode of Delivery
<b>UNIT-I FLUID STATICS, BUOYANCY AND FLOATATION</b> <b>CO1:</b> Determine the fluid pressure and use various devices for measuring fluid pressure. <b>TB:</b> Fluid Mechanics- Fundamentals and Applications by Y.A. Cengel, J.M.Cimbala, 6th Edn, McGraw-Hill			
1	Introduction: physical properties of fluids- density, specific weight, specific gravity, specific volume	<b>From:</b> 07/08/2023  <b>To:</b> 23/08/2023	Lecture interspersed with discussions, PPT
2	Viscosity and its significance		
3	Surface tension		
4	Capillarity-capillary rise, capillary fall		
5	Measurement of pressure-vapor pressure, Atmospheric gauge, and vacuum pressure		
6	Manometers- Piezometer, U-tube		
7	Inverted manometers		
8	Differential manometers		
9	Pascal's law, hydrostatic law		
10	Buoyancy and floatation- Meta centre, meta-centric height		
11	Determination of met centric height		
12	Stability of floating body. Submerged bodies		
13	Stability analysis and applications		
<b>UNIT-II FLUID KINEMATICS, FLUID DYNAMICS AND CLOSED CONDUIT FLOW</b> <b>CO2:</b> Apply general governing equations for various fluid flows and analyse the losses in pipes. <b>TB:</b> Fluid Mechanics- Fundamentals and Applications by Y.A. Cengel, J.M.Cimbala, 6th Edn, McGraw-Hill			
14	Introduction, Flow types		
15	Streamline, Path line and Streak lines and Stream tube.		
16	Equation of continuity for one-Dimensional flow.		
17	Stream function		



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18	Velocity potential function, differences, and relation between them	<b>From:</b> <b>24/08/2023</b>  <b>To:</b> <b>15/09/2023</b>	Lecture interspersed with discussions
19	Condition for irrotational flow		
20	Circulation and Vorticity		
21	Flow net, Source, and Sink		
22	Doublet and Vortex flow		
23	Surface and Body forces –Euler’s equation Bernoulli’s equation for flow along a streamline		
24	Applications of Bernoulli’s equation		
25	Momentum equation and its applications		
26	force on pipe bend		
27	Closed conduit flow: Reynolds experiment		
28	Darcy Weisbach equation		
29	Minor losses in pipes-losses due to sudden expansion, contraction, pipe bend, couplings etc.		
30	Pipes in series and pipes in parallel		
31	Total energy line- hydraulic gradient line.		
<b>UNIT-III BOUNDARY LAYER THEORY, DIMENSIONAL ANALYSIS</b> <b>CO3: Identify the boundary layer theory, flow separation, and examine dimensionless numbers.</b> <b>TB: Fluid Mechanics and Hydraulic Machines - RK Bansal- Laxmi Publications (P) Ltd.</b>			
32	Introduction: Boundary layer, Boundary layer formation over flat plate	<b>From:</b> <b>28/09/2023</b>  <b>To:</b> <b>07/10/2023</b>	Lecture interspersed with discussions
33	Displacement, momentum, energy thickness		
34	Momentum integral equation		
35	Separation of boundary layer, control of flow separation		
36	Streamlined body, Bluff body and its applications		
37	Basic concepts of velocity profiles		
38	Dimensionless numbers-Reynold’s, weber, Froud’s, Mach numbers		
<b>UNIT-IV BASICS OF TURBOMACHINERY, HYDRAULIC TURBINES</b> <b>CO4: Apply momentum principles to the impact of jets and evaluate their performance, as well as hydraulic turbine performance.</b> <b>TB: Fluid Mechanics and Hydraulic Machines - RK Bansal- Laxmi Publications (P) Ltd.</b>			
39	Hydrodynamic force of jets on stationary flat, inclined, and curved vanes		Lecture



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40	Hydrodynamic force of jets on moving flat, inclined, and curved vanes	<b>From:</b> <b>09/10/2023</b>  <b>To:</b> <b>01/11/2023</b>	interspersed with discussions, Student Seminar
41	Jet striking centrally and at tip		
42	Velocity diagrams, work done and efficiency		
43	Flow over radial vanes		
44	Classification of turbines		
45	Impulse and reaction turbines		
46	Pelton wheel, Francis's turbine		
47	Kaplan turbine-working proportions, work done, efficiencies		
48	Hydraulic design – draft tube- theory		
49	Functions and efficiency		

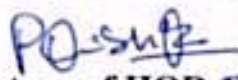
**UNIT-V PERFORMANCE OF HYDRAULIC TURBINES, CENTRIFUGAL PUMPS, RECIPROCATING PUMPS**

**CO5:** Identify working principles and performance evaluation of hydraulic turbines and pumps.

**TB:** Fluid Mechanics- Fundamentals and Applications by Y.A. Cengel, J.M.Cimbala, 6th Edn, McGraw-Hill

50	Geometric similarity	<b>From:</b> <b>02/11/2023</b>  <b>To:</b> <b>18/11/2023</b>	Lecture interspersed with discussions
51	Unit and specific quantities		
52	Characteristic curves, governing of turbines		
53	Selection of type of turbine, cavitation		
54	Surge tank, water hammer		
55	Hydraulic systems- hydraulic ram		
56	Hydraulic lift, hydraulic coupling		
57	Fluidics – amplifiers, sensors, and oscillators		
58	Advantages, limitations, and applications		
59	Classification of centrifugal pump		
60	Working, work done – manometric head- losses and efficiencies		
61	Specific speed- pumps in series and parallel		
62	Performance characteristic curves		
63	Cavitation & NPSH		
64	Reciprocating pumps: Working		
65	Discharge, Slip		
66	Indicator diagrams		

  
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**SRKIT / MECH**

**TENTATIVE LESSON PLAN: R2021011**

<b>Course Title: MATHEMATICS-III</b>			
<b>Section : MECH</b>	<b>Date : 07-08-2023</b>	<b>Page No : 01 of 04</b>	
<b>Revision No : 00</b>	<b>Prepared By : K,BASAVARAJU</b>	<b>Approved By : HOD</b>	
<b>Tools: Black board</b>			
<b>No. of Periods</b>	<b>TOPIC</b>	<b>Date</b>	<b>Mode of Delivery</b>
<b>UNIT – I: VECTOR CALCULUS</b>			
<b>CO1: To interpret the physical meaning of different operators such as gradient, curl and divergence, to estimate the work done against a field, circulation and flux using vector calculus</b>			
<b>TB: "Engineering Mathematics", Dr. T.K.V.Iyengar; S.Chand publications</b>			
1	<b>Vector Differentiation: Introduction</b>	From: 07-08-23 To 25-08-23	Lecture interspersed with discussions
2	Properties of vectors and scalars		
3	Derivative of vector – definition		
4	Vector differential operator		
5	Gradient of a vector		
6	Divergence of a vector		
7	Curl of a vector		
8	Properties of gradient		
9	Vector identities		
10	Vector identities		
11	Problems on application of gradient		
12	Problems on divergence and curl		
13	<b>Vector Integration: Introduction</b>		
14	Problems on line integral		
15	Problems on line integral		
16	Problems on surface integrals		
17	Problems on volume integrals		
18	Problems on Greens theorem		
19	Problems on Green theorem		
20	Problems on Gauss divergence theorem		
21	Problems on stokes theorem		
<b>UNIT – II: LAPLACE TRANSFORMS</b>			
<b>CO2: To apply the Laplace transform for solving differential equations</b>			
<b>TB: "Engineering Mathematics", Dr. T.K.V.Iyengar; S.Chand publications</b>			
22	Laplace Transforms: Definitions, Existence		
23	Laplace Transform of standard functions		

24	Linearity property; Shifting properties Change of scale property	From 26-08-23 To 15-09-23	Lecture interspersed with discussions
25	Laplace Transforms of derivatives; Integrals		
26	$L(t^n f(t))$		
27	Laplace Transforms of division by t		
28	Evaluation of integrals		
29	Laplace Transforms of periodic functions; unit step functions; Unit impulse functions		
30	<b>Inverse Laplace Transforms:</b> Finding $L^{-1}$ using partial fractions		
31	Properties of inverse transform		
32	Convolution theorem		
33	Solutions of Difference Equations		

### UNIT – III: FOURIER SERIES AND FOURIER TRANSFORMS

CO3: TO find or compute the Fourier series of periodic signals, able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms

TB: "Engineering Mathematics", Dr. T.K.V.Iyengar; S.Chand publications

34	Introduction	From 16-09-23 To 23-09-23 & From 03-10-23 To 12-10-23	Lecture interspersed with discussions
35	Periodic functions		
36	Fourier series of periodic function		
37	Dirchlets conditions		
38	Even and odd functions		
39	Change of interval		
40	Half range sine and cosine series		
41	Fourier transforms		
42	Fourier integral theorem		
43	Fourier sine and cosine integrals		
44	Sine and cosine transforms		
45	Properties		
46	Inverse transforms		
47	Finite Fourier transforms		

### UNIT – IV: PDE OF FIRST ORDER

CO4: To identify solution methods for partial differential equations that model physical processes

TB: "Engineering Mathematics", Dr. T.K.V.Iyengar; S.Chand publications

48	Introduction	From	Lecture interspersed
49	Formation of PDE by eliminating arbitrary constants		
50	Formation of PDE by eliminating arbitrary functions		
51	Solutions of PDE		
52	Method of grouping		
53	Method of multipliers		

54	Nonlinear PDE $f(p, q) = 0$	13-10-23 To 28-10-23	with discussions
55	Nonlinear PDE $f(p, q, z) = 0$		
56	Nonlinear PDE $f(p, x) = g(q, y)$		
57	Clairaut's equation		
58	PDE reducible to standard form		
59	$f(px^m, qy^n) = 0$		
60	$f(pz^m, qz^m) = 0$		
<b>UNIT – V: SECOND ORDER PARTIAL DIFFERENTIAL EQUATIONS AND APPLICATIONS</b>			
<b>CO5: To identify solution methods for partial differential equations that model physical processes</b>			
<b>TB: "Engineering Mathematics", Dr. T.K.V.Iyengar; S.Chand publications</b>			
61	Introduction; Homogeneous Linear P.D.E with constant coefficients; finding CF Finding PI: RHS term of the type $e^{(ax+by)}$	From 30-10-23 To 19-11-23	Lecture interspersed with discussions
62	$\sin(ax + by); \cos(ax + by)$		
63	$x^m y^n$		
64	Method of separation of variables		
65	Solution of one dimensional wave equation		
66	Heat equation		
67	Two dimensional Laplace equation		

K. Baswaraj  
Signature of Faculty 7/8/23

P. S. S. S.  
Signature of HOD 08/08/23



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**TENTATIVE LESSON PLAN**

**Course/Code: KINEMATICS OF MACHINERY/ R2032034**

**Year / Semester : II/I**

**Section: I**

**A.Y: 2022-23**

No. of Periods	TOPIC	Date	Mode of Delivery
<b>UNIT-I MECHANISMS</b> <b>CO1: The objective of this unit is to make student understand the purpose of kinematics, Kinematic joint and mechanism and to study the relative motion of parts in a machine without taking into consideration the forces involved.</b> <b>TB1: Theory of Machines – S. S Rattan- TMH Publishers.</b> <b>TB2: Theory of machines / Khurmi / S.Chand.</b>			
1	Elements or Links – Classification – Rigid Link, flexible and fluid link	07-08-2023 TO 24-08-2023	Lecture interspersed with discussions
2	Types of kinematic pairs – sliding, turning, rolling, screw and spherical pairs		
3	lower and higher pairs – closed and open pairs – constrained motion		
4	completely, partially or successfully constrained and incompletely constrained		
5	Khuzbrals criteria , Grashoff's law , Degrees of freedom		
6	Kutzbach criterion for planar mechanisms, Mechanism and machines		
7	classification of machines – kinematic chain – inversion of mechanism		
8	Inversion of mechanism – inversions of quadric cycle, chain – single and double slider cranks chains.		
<b>UNIT-II LOWER PAIR MECHANISM</b> <b>CO2: The objective of this unit is to make student understand various mechanisms for straight line motion and their applications including steering mechanism.</b> <b>TB1: Theory of Machines – S. S Rattan- TMH Publishers.</b> <b>TB2: Theory of machines / Khurmi / S.Chand.</b>			
9	Exact and approximate copiers and generated types – Peaucellier		



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	Chebicheff		
11	Robert Mechanisms and straight line motion, Pantograph		
12	Conditions for correct steering – Davis Steering gear		
13	Ackermans steering gear	25-08-2023	Lecture interspersed with discussions, PPT
14	velocity ratio; Hooke's Joint: Single and double	TO	
15	Universal coupling–application–problems.	19-09-2023	
<b>UNIT-III KINEMATICS</b>			
<p><b>CO3: The objective of this unit is to make student understand the velocity and acceleration concepts and the methodology using graphical methods and principles and application of four bar chain. To understand the application of slider crank mechanism etc. and study of plane motion of the body.</b></p> <p><b>TB1: Theory of Machines – S. S Rattan- TMH Publishers.</b></p> <p><b>TB2: Theory of machines / Khurmi / S.Chand.</b></p>			
16	Velocity and acceleration – Motion of a link in machine		
17	Determination of Velocity and acceleration diagrams – Graphical method		
18	Application of relative velocity method four bar chain.		
19	Velocity and acceleration analysis of for a given mechanism	21-09-2023	Lecture interspersed with discussions
20	Kleins construction, Coriolis acceleration, determination of Coriolis component of acceleration.	TO	
21	Plane motion of body: Instantaneous center of rotation,centroids and axodes	09-10-2023	
23	Graphical determination of instantaneous centre		
24	diagrams for simple mechanisms and determination of angular velocity of points and links		
<b>UNIT-IV CAMS</b>			
<p><b>CO4: The objective of this unit is to make student understand the theories involved in cams.</b></p> <p><b>TB1: Theory of Machines – S. S Rattan- TMH Publishers.</b></p> <p><b>TB2: Theory of machines / Khurmi / S.Chand.</b></p>			
25	Definitions of cam and followers – their uses		





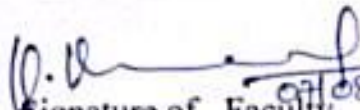
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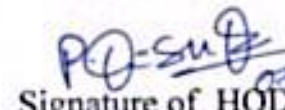
26	Types of followers and cams	10-10-2023 TO 04-11-2023	Lecture interspersed with discussions, student seminar
27	Terminology –Types of follower motion		
28	Uniform velocity, Simple harmonic motion and uniform acceleration and retardation		
29	Maximum velocity		
30	maximum acceleration during outward and return strokes in the above 3 cases.		
31	Analysis of motion of followers		
32	Roller follower		
33	Circular cam with straight		
34	concave and convex flanks		
<b>UNIT-V GEARS, GEAR TRAINS</b>			
<p><b>CO5: The objective of this unit is to make student understand gears, power transmission through different types of gears including gear profiles and its efficiency.</b></p> <p><b>TB1: Theory of Machines – S. S Rattan- TMH Publishers.</b></p> <p><b>TB2: Theory of machines / Khurmi / S.Chand.</b></p>			
35	Higher pairs, friction wheels	06-11-2023 TO 18-11-2023	Lecture interspersed with discussions, PPT
36	toothed gears–types		
37	law of gearing		
38	condition for constant velocity ratio for transmission of motion		
39	Form of teeth: cycloidal and involute profiles		
40	Velocity of sliding –phenomena of interferences		
41	Methods of interference		
42	Condition for minimum number of teeth to avoid interference,		
43	expressions for arc of contact and path of contact		
44	Introduction to Helical		
45	Bevel		
46	Worm gearing		
47	Introduction		
48	Belt and rope drives		
49	Selection of belt drive		
50	Types of belt drives		
51	V-belts		
52	Materials used for belt and rope drives		
53	Velocity ratio of belt drives		
54	Slip of belt, creep of belt		



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55	Tensions for flat belt drive		
56	Angle of contact		
57	Centrifugal tension		
58	Maximum tension of belt		
59	Chains- length, angular speed ratio		
60	Classification of chains		

  
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### TENTATIVE LESSON PLAN

**Course/Code: MECHANICS OF SOLIDS / R2021031**

**Year / Semester : II/I**

**Section: I**

**A.Y: 2022-23**

No. of Periods	TOPIC	Date	Mode of Delivery
<b>UNIT-I SIMPLE STRESSES &amp; STRAINS</b>			
<b>CO1:</b> Model & Analyze the behavior of basic structural members subjected to various loading and support conditions based on principles of equilibrium.			
<b>TB:</b> Strength of materials /GH Ryder/ Mc Millan publishers IndiaLtd.			
<b>UNIT-I</b>			
1	<b>SIMPLE STRESSES &amp; STRAINS:</b> Elasticity and plasticity	From: 05-09-2023  To: 22-09-2023	Lecture interspersed with discussions, Revision Practice Tests
2	Types of stresses & strains– Hooke’s law		
3	stress – strain diagram for mild steel		
4	Working stress – Factor of safety		
5	Lateral strain, Poisson’s ratio & volumetric strain		
6	Bars of varying section		
7	Composite bars – Temperature stresses		
8	Complex Stresses Stresses on an inclined plane under different uniaxial and biaxial stress conditions		
9	Principal planes and principal stresses		
10	Mohr’s circle - Relation between elastic constants		
11	Strain energy – Resilience		
12	Gradual, sudden, impact and shock loadings		
<b>UNIT-II SHEAR FORCE AND BENDING MOMENT</b>			
<b>CO2:</b> Identify the concept of stress and strain to analyze and design structural members and machine parts under axial, shear and bending loads, moment and torsion moment.			
<b>TBI:</b> Strength of materials /GH Ryder/ Mc Millan publishers IndiaLtd.,			
<b>UNIT-II</b>			
13	Definition of beam – Types of beams	From: 23-09-2023  To: 15-10-2023	Lecture interspersed with discussions, Power point Presentations
14	Concept of shear force and bending moment		
15	S.F and B.M diagrams for cantilever		
16	simply supported and overhanging beams subjected to point loads		
17	simply supported and overhanging beams subjected to UDL loads		
18	Simply supported and overhanging beams subjected to UVL loads		
19	Combination of these loads		
20	Point of contra flexure		
21	Relation between S.F., B.M		
22	Rate of loading at a section of a beam		



**UNIT-III FLEXURAL STRESSES, SHEAR STRESSES**

**CO3:** Discover all the methods to analyze beams, columns, and frames for normal, shear, and torsion stresses and to solve deflection problems in preparation for the design of such structural components.

**TB2:** Strength of materials by B.C. Punmia-lakshmi publications pvt.Ltd, NewDelhi.

UNIT-III			
23	Theory of simple bending	From: 18-10-2023  To: 04-11-2023	Lecture interspersed with discussions, Revision Practice Tests
24	Assumptions – Derivation of bending equation: $M/I = f/y = E/R$		
25	Neutral axis – Determination bending stresses		
26	Section modulus of rectangular and circular sections		
27	Section modulus of I-sections		
28	Section modulus of T-Sections		
29	Section modulus of Angle sections		
30	Section modulus of Channel sections		
31	Design of simple beam sections.		
32	Derivation of formula		
33	Shear stress distribution across various beams sections		
34	Like rectangular, circular, triangular		
35	Angle sections		

**UNIT-IV DEFLECTION OF BEAMS, TORSION**

**CO4:** Contrast the deeper understanding of the loads, stresses, and strains acting on a structure and their relations in the elastic behavior.

**TB1:** Strength of materials /GH Ryder/ Mc Millan publishers IndiaLtd.

UNIT-IV			
36	Bending into a circular arc – slope	From: 05-11-2023  To: 06-12-2023	Lecture interspersed with discussions, Power point Presentations
37	Deflection and radius of curvature		
38	Differential equation for the elastic line of a beam		
39	Double integration and Macaulay's methods		
40	Determination of slope and deflection for cantilever		
41	simply supported beams subjected to point loads		
42	simply supported beams subjected to UDL loads		
43	simply supported beams subjected to UVL loads		
44	Mohr's theorems		
45	Moment area method		
46	Application to simple cases including overhanging beams		
47	Statically indeterminate Beams and solution methods		
48	Introduction to torsion		
49	Derivation- Torsion of Circular shafts		
50	Pure Shear-Transmission of power by circular shafts		
51	Shafts in series, Shafts in parallel.		

**UNIT-V THIN AND THICK CYLINDERS, COLUMNS.**

**CO5:** Design and analysis of Industrial components like pressure vessels.



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**TB2:** Strength of materials by B.C. Punmia-lakshmi publications pvt.Ltd, NewDelhi.

UNIT-V			
52	Thin seamless cylindrical shells	From: 07-12-2023  To: 24-12-2023	<b>Lecture interspersed with discussions, Student seminars</b>
53	Derivation of formula for longitudinal and Circumferential stresses		
54	Hoop, longitudinal and Volumetric strains		
55	Changes in diameter, and volume of thin cylinders		
56	Riveted boiler shells		
57	Thin spherical shells		
58	Wire wound thin cylinders		
59	Lame's equation		
60	Cylinders subjected to inside & outside pressures		
61	Compound cylinders.		
62	Introduction to columns		
63	Buckling and Stability of columns		
64	Columns with Pinned ends		
65	Columns with other support Conditions		
66	Limitations of Euler's Formula, Rankine's Formula		

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Signature of HOD

5/9/23



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### TENTATIVE LESSON PLAN

**Course/Code: MACHINING, MACHINE TOOLS & METROLOGY/ R2031033**

**Year / Semester : III/II**

**Section: I**

**A.Y: 2022-23**

**Tools: BLACK BOARD, PPTs**

No. of Periods	TOPIC	Date	Mode of Delivery
<b>UNIT-I INTRODUCTION</b>			
<b>CO1: Discuss the concepts of machining processes.</b>			
<b>TB 1 : "Workshop technology", B.S Raghuwanshi, Vol. II , Dhanpat Rai &amp; Co. (p) Ltd.,</b>			
1	Elementary treatment of metal cutting	From: 01/08/2023  To: 20/08/2023	Lecture interspersed with discussions
2	Element of cutting process		
3	Geometry of single point cutting tool		
4	Tool Signature, Tool angles		
5	Mechanism of metal cutting		
6	Chip formation and types of chips		
7	Built up edge and its effects, Chip breakers		
8	Problem		
9	Mechanics of orthogonal cutting & oblique cutting		
10	Merchant's force diagram, cutting forces		
11	Velocity ratio, cutting speeds, feed, depth of cut		
12	Taylor's Tool life, tool wear, machinability		
13	Tool wear, tool wear mechanism, machinability		
14	Economics of machining, coolants, tool materials and properties and problems		
<b>UNIT-II LATHE MACHINES, SHAPING, SLOTTING &amp; PLANNING MACHINES</b>			
<b>CO2: Apply the principles of lathe, shaping, slotting and planning machines.</b>			
<b>TB 1 : "Workshop technology", B.S Raghuwanshi, Vol. II , Dhanpat Rai &amp; Co. (p) Ltd.,</b>			
15	Principle Of working, specification of lathe	From: 22/08/2023	Lecture interspersed with discussions
16	Types of lathe, work holders & tool holders		
17	Box tools, taper turning		
18	Thread turning for lathes and attachments		
19	constructional features of speed gear box and feed gear box		
20	Turret and capstan lathes & collet chucks		
21	Other work holders & tool holding devices		



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22	Principal features of automatic lathes	To: 12/09/2023	
23	Classification of automatic lathes, single spindle and multi-spindle automatic lathes .		
24	Tool layout and cam design for automats and problems		
25	Principles of working , principal parts of shaper		
26	specifications, principle of operation of shaper		
27	Machining time calculations of shaper, Principles of working of slotter		
28	Principal parts of slotter, principle of operation of slotter		
29	Machining time calculations of slotter, Principles of working of planner		
30	principal parts of planner, principle of operation of planner		
31	Machining time calculations of planner		

**UNIT-III DRILLING, BORING & MILLING MACHINES**

**CO3: Apply the principles of drilling, milling and boring processes.**

**TB 1 : "Workshop technology", B.S Raghuvanshi, Vol. II , Dhanpat Rai & Co. (p) Ltd.,**

32	Principles of working, specifications, types of drilling machines	From: 13/09/2023 To: 17/10/2023	Lecture interspersed with discussions
33	Operations Performed, tool holding devices of drilling machines		
34	Twist drills and types		
35	Boring Machines, fine Boring Machines		
36	Jig boring machine, deep hole Drilling Machine and problems		
37	Principles Of working of milling machines		
38	Specifications, classification Of Milling Machines		
39	Principal features of horizontal, vertical Milling Machines		
40	Working of universal Milling Machine		
41	Machining operations, types Of cutters		
42	Geometry of milling Cutters		
43	Methods of indexing		
44	Accessories to milling machines		

**UNIT-IV FINISHING PROCESSES & SYSTEMS OF LIMITS AND FITS**

**CO4: Analyze the concepts of finishing processes and the system of limits and fits.**

**TB 1 : "Workshop technology", B.S Raghuvanshi, Vol. II , Dhanpat Rai & Co. (p) Ltd.,**




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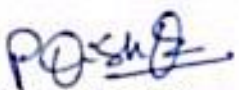
45	Theory of grinding, Classification of grinding machines	<p align="center">From: 18/10/2023</p> <p align="center">To: 07/11/2023</p>	<p align="center">Lecture interspersed with discussions</p>
46	Cylindrical and surface grinding machines		
47	Tools and cutter grinding machines		
48	Different types of abrasives, Bonds, specification of grinding machines		
49	Selection of a grinding wheel, Lapping, Honing operations		
50	Broaching operations		
51	Lapping, Honing & Broaching operations comparison to grinding		
52	<b>SYSTEMS OF LIMITS AND FITS:</b> nominal size, tolerance, limits, deviations, different types of fits		
53	Unilateral and bilateral tolerance system, hole and shaft basis systems		
54	Interchangeability , deterministic & statistical tolerances, selective assembly		
55	International standard system of tolerances, selection of limits and tolerances for correct functioning		
56	Problems related to limits and fits, Taylor's principle		
57	Design of go and no go gauges; plug, ring, snap, gap, taper, profile and position gauges		
58	Inspection of gauges		
<p><b>UNIT-V SURFACE ROUGHNESS MEASUREMENT &amp; OPTICAL MEASURING INSTRUMENTS</b></p> <p><b>CO5: Apply the knowledge about the concepts of surface roughness and optical measuring instruments.</b></p> <p><b>TB 2: " A textbook of metrology", M. Mahajan, 4<sup>th</sup> Edition, Elsevier.</b></p>			
59	Differences between surface roughness and surface waviness	<p align="center">From: 09/11/2023</p> <p align="center">To: 26/11/2023</p>	<p align="center">Lecture interspersed with discussions</p>
60	Numerical assessment of surface finish- CLA, Rt., R.M.S. Rz, R10 values		
61	Method of measurement of surface finish		
62	Profilograph, Talysurf, ISI symbols for indication of surface finish		
63	Tools maker's microscope, Autocollimators		
64	Optical projector		
65	Optical flats working principle,		
66	Construction , merits		
67	Demerits and their uses of Optical flats		
68	Optical comparators		




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TB 1 : "Workshop technology", B.S Raghuvanshi, Vol. II , Dhanpat Rai & Co. (p) Ltd.,  
TB 2: " A textbook of metrology", M. Mahajan, 4<sup>th</sup> Edition, Elsevier.

  
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### TENTATIVE LESSON PLAN

**Course/Code: PRODUCTION TECHNOLOGY / R2021033**

**Year / Semester: II/I**

**Section: ---**

**A.Y: 2023-24**

No. of Periods	TOPIC	Date	Mode of Delivery
<b>UNIT-I CASTING</b> <b>CO1: Design the patterns and core boxes for metal casting processes</b> <b>TBI: " Manufacturing Technology -Vol I- P.N. Rao- TMH.</b>			
1	Steps involved in making a casting	From:  07/08/23  To:  21/08/23	Lecture interspersed with discussions, PPT
2	Advantage of casting and its applications.		
3	Patterns and Pattern making		
4	Types of patterns		
5	Materials used for patterns, pattern allowances and their construction		
6	Molding – molding methods		
7	ingredients of molding sand –. Molding materials		
8	Properties of molding sand, Testing of molding sand		
9	Types of molding – Hand molding		
10	Machine molding		
11	Core – different types of cores		
12	materials – properties of core sand – core manufacturing.		
<b>UNIT-II GATING SYSTEMS, MELTING FURNACES &amp; TYPES OF CASTINGS</b> <b>CO2: Design the gating system for different metallic components</b> <b>TBI: " Manufacturing Technology -Vol I- P.N. Rao- TMH.</b>			
13	Principles of Gating	From:  22/08/23  To:  05/09/23	Lecture interspersed with discussions
14	Gating ratio and design of Gating systems		
15	Casting design considerations, Methods of melting and types of furnaces		
16	cupola, electric arc furnaces		
17	resistance and induction furnaces		
18	Solidification of castings		
19	Solidification of pure metals and alloys- short & long freezing range alloys, Fettling		
20	Casting defects.		



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21	Risers- Types, function		
22	Design of risers		
23	Basic principles and applications of Centrifugal casting- True, semi and centrifuging		
24	Die casting		
25	Investment casting, Shell molding		
<b>UNIT-III WELDING</b>			
<b>CO3: Illustrate and classify different types of welding processes used for special fabrication</b>			
<b>TB2: " Production Technology- R.K. Jain- Khanna</b>			
26	Classification of welding processes,	From: 08/09/23  To: 21/09/23	Lecture interspersed with discussions, Student Seminar
27	types of welded joints, characteristics		
28	Gas welding		
29	Different types of flames and uses		
30	Oxy – Acetylene Gas cutting.		
31	Basic principles of Arc welding, power characteristics		
32	Manual metal arc welding		
33	Sub merged arc welding,		
34	Inert Gas welding- TIG & MIG welding		
35	Electro – slag welding		
36	Resistance welding, spot welding		
37	Seam, Upset, Flash welding		
38	Friction welding, Friction stir welding		
39	Forge welding, Explosive welding		
40	Thermit welding		
41	Plasma welding		
42	Laser welding		
43	electron beam welding		
44	Soldering & Brazing		
45	Heat affected zones in welding-pre & post heating		
46	Weldability of metals		
47	welding defects – causes and remedies		
48	Destructive testing of welds		
49	nondestructive testing of welds		
<b>UNIT-IV BULK FORMING PROCESSES</b>			
<b>CO4: Use forging, rolling and extrusion processes</b>			
<b>TB2: " Production Technology- R.K. Jain- Khanna .</b>			
50	Plastic deformation in metals and alloys		
51	recovery, recrystallization and grain growth		
52	Hot working and Cold working		
53	Strain hardening and Annealing		



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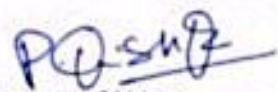
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54	Types Forging- Smith forging, Drop Forging	From: 03/10/23  To: 26/10/23	Lecture interspersed with discussions, PPT
55	Roll forging		
56	Forging hammers		
57	Rotary forging		
58	forging defects		
59	Rolling – fundamentals, types of rolling mills and products		
60	Forces in rolling and power requirements.		
61	Extrusion and its characteristics		
62	Types of extrusion- introduction, Impact extrusion		
63	Hydrostatic extrusion		
64	Wire drawing and Tube drawing		
<b>UNIT-V SHEET METAL FORMING PROCESSES</b>			
<b>CO5 : Understand and apply various sheet metal forming processes</b>			
<b>TB2:“ Production Technology- R.K. Jain- Khanna .</b>			
65	Sheet metal forming - Blanking and piercing	From: 03/11/23  To: 18/11/23	Lecture interspersed with discussions, PPT
66	Forces and power requirement in these operations		
67	Deep drawing		
68	Stretch forming		
69	Bending		
70	Spring back and its remedies		
71	Coining, Spinning		
72	Types of presses and press tools		
73	Principles of explosive forming		
74	electromagnetic forming, Electro hydraulic forming, rubber pad forming		

**TB1: “ Manufacturing Technology -Vol I- P.N. Rao- TMH**

**TB2:“ Production Technology- R.K. Jain- Khanna .**

  
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**TENTATIVE LESSON PLAN**

**Course/Code:** Thermal Engineering-II / R2031031

**Year / Semester :** III/I

**A.Y:** 2023-24

No. of Periods	TOPIC	Date	Mode of Delivery
<b>UNIT-I BASIC CONCEPTS, BOILERS</b>			
<b>CO1: Comprehend the concept of Rankine cycle. Interpret working of boilers including water tube, fire tube and high pressure boilers and determine efficiencies.</b>			
<b>TB 1 - "THERMAL ENGINEERING-II", PAKIRAPPA.</b>			
1	Rankine cycle - schematic layout	<b>From:</b>  <b>17-07-2023</b>  <b>To:</b>  <b>11-08-2023</b>	Lecture interspersed with discussions, PPT
2	Thermodynamic analysis		
3	Problems on Rankine cycle		
4	Concept of mean temperature of heat addition		
5	Methods to improve cycle performance		
6	Regeneration		
7	Problems on regeneration		
8	Reheating		
9	Problems on reheating		
10	Combustion: fuels and combustion		
11	Concepts of heat of reaction		
12	Adiabatic flame temperature		
13	Stoichiometry, flue gas analysis		
14	Problem		
15	Boilers : classification		
16	Working principles of L.P & H.P boilers with sketches		
17	Working principles of L.P & H.P boilers with sketches		
18	Mountings- working principles		
19	Accessories- working principles		
20	Boiler horse power, equivalent evaporation, efficiency		
21	Heat balance		
22	Draught, classification		
23	Height of chimney for given draught and discharge		
24	Condition for maximum discharge, efficiency of chimney		
25	Problems		
<b>UNIT-II STEAM NOZZLES &amp; STEAM TURBINES</b>			
<b>CO2: Analyze the flow of steam through nozzles. Evaluate the performance steam turbines.</b>			
<b>TB 1 - "THERMAL ENGINEERING-II", PAKIRAPPA.</b>			



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26	<b>STEAM NOZZLES</b> :Function of a nozzle – applications - types,	<p align="center"><b>From:</b> 14-08-2023 <b>To:</b> 28-08-2023</p>	<p align="center">Lecture interspersed with discussions</p>
27	Flow through nozzles, thermodynamic analysis – assumptions		
28	Velocity of fluid at nozzle exit-Ideal and actual expansion in a nozzle		
29	Velocity coefficient, condition for maximum discharge		
30	Critical pressure ratio, criteria to decide nozzle shape		
31	Super saturated flow, its effects, degree of super saturation		
32	Degree of under cooling - Wilson line		
33	<b>STEAM TURBINES:</b> Classification – impulse turbine; mechanical details		
34	Velocity diagram – effect of friction – power developed		
35	Axial thrust, blade or diagram efficiency – condition for maximum efficiency		
36	De-laval turbine - methods to reduce rotor speed		
37	Velocity compounding, pressure compounding and velocity & pressure compounding		
38	Velocity and pressure variation along the flow – combined velocity diagram for a velocity compounded impulse turbine, condition for maximum efficiency		
<p><b>UNIT-III REACTION TURBINE &amp; STEAM CONDENSERS</b> <b>CO3: Evaluate the performance of reaction turbines and steam condensers.</b> <b>TB 1 - "THERMAL ENGINEERING-II", PAKIRAPPA.</b></p>			
39	<b>REACTION TURBINE:</b> Mechanical details – principle of operation	<p align="center"><b>From:</b> 30-08-2023 <b>To:</b> 30-09-2023</p>	<p align="center">Lecture interspersed with discussions, Student Seminar</p>
40	Thermodynamic analysis of a stage, degree of reaction		
41	Velocity diagram – Parson's reaction turbine		
42	Condition for maximum efficiency		
43	Calculation of blade height		
44	<b>STEAM CONDENSERS:</b> Requirements of steam condensing plant		
45	Classification of condensers – working principle of different types		
46	Vacuum efficiency and condenser efficiency – air leakage, sources and its affects		
47	Air pump- cooling water requirement		
48	Problems		
<p><b>UNIT-IV COMPRESSORS, RECIPROCATING, ROTARY</b></p>			



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**CO4: Discuss the concepts of reciprocating and rotary type of compressors.**  
**TB 2 - "THERMAL ENGINEERING-I", PAKIRAPPA.**

49	Compressors: classification	<b>From:</b>  <b>03-10-2023</b>  <b>To:</b>  <b>19-10-2023</b>	Lecture interspersed with discussions, PPT
50	Fan, blower and compressor		
51	Positive displacement and non-positive displacement type		
52	Reciprocating and rotary types		
53	Reciprocating and rotary types		
54	RECIPROCATING: Principle of operation, work required		
55	Isothermal efficiency, volumetric efficiency		
56	Effect of clearance, multi stage compression		
57	Saving of work, minimum work condition for two stage compression		
58	Rotary:roots blower		
59	Vane sealed compressor, Lysholm compressor		
60	Mechanical details and principle of working		
61	Efficiency considerations		

**UNIT-V CENTRIFUGAL COMPRESSORS, AXIAL FLOW COMPRESSORS**

**CO5: Acquire knowledge about the centrifugal and axial flow compressors.**  
**TB 2 - "THERMAL ENGINEERING-I", PAKIRAPPA.**

62	CENTRIFUGAL COMPRESSORS: Mechanical details and principle of operation	<b>From:</b>  <b>26-10-2023</b>  <b>To:</b>  <b>25-11-2023</b>	Lecture interspersed with discussions
63	Velocity and pressure variation		
64	Energy transfer-impeller blade shape-losses		
65	Slip factor, power input factor		
66	Pressure coefficient and adiabatic coefficient		
67	Velocity diagrams – power		
68	AXIAL FLOW COMPRESSORS: Mechanical details and principle of operation		
69	Velocity triangles and energy transfer per stage degree of reaction		
70	Work done factor – isentropic efficiency		
71	Pressure rise calculations		
72	Poly tropic efficiency		

  
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### TENTATIVE LESSON PLAN

**Course/Code: DESIGN OF MACHINE MEMBERS-I / R2031032**

**Year / Semester: III/I**

**Section: —**

**A.Y: 2023-24**

S.No	TOPIC	Date	Mode of Delivery
<b>UNIT-I INTRODUCTION, STRESSES IN MACHINE MEMBERS</b> <b>CO1: Select the suitable materials and significance of tolerances and fits in critical design applications and also apply the design procedure to engineering problems including the consideration of technical and manufacturing constraints</b> <b>TB 1: "DESIGN OF MACHINE ELEMENTS", V.B. BHANDARI, 3<sup>rd</sup> Edition, Tata McGraw Hill Education Private Limited publications.</b>			
1	General considerations in the design of Engineering Materials	From: 17/07/23  To: 09/08/23	Lecture interspersed with discussions
2	Mechanical properties, Manufacturing consideration in design		
3	Tolerances and fits		
4	BIS codes of steels, ASHBY Charts		
5	<b>STRESSES IN MACHINE MEMBERS: Simple stresses</b>		
6	combined stresses —Torsional and bending stresses		
7	Impact stresses — stress strain relation		
8	various theories of failure		
9	Factor of safety , design for strength and rigidity		
10	preferred numbers		
11	The concept of stiffness in tension, bending and combined situations		
12	Static strength design based on fracture toughness		
13	Problems on theories of failures		
<b>UNIT-II STRENGTH OF MACHINE ELEMENTS</b> <b>CO2: Calculate dynamic stresses in the machine components subjected to variable loads.</b> <b>TB 1: "DESIGN OF MACHINE ELEMENTS", V.B. BHANDARI, 3<sup>rd</sup> Edition, Tata McGraw Hill Education Private Limited publications.</b>			
14	Stress concentration		
15	theoretical stress concentration factor		
16	fatigue stress concentration factor, notch sensitivity		
17	design for fluctuating stresses		
18	endurance limit, estimation of endurance strength		
19	Problems on Stress concentration factor		





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20	Problems on endurance limit	From: 10/08/23  To: 23/08/23	Lecture interspersed with discussions
21	S-N curve, problems on S-N curve		
22	Goodman ' s line, problems		
23	Soderberg's line, problems		
24	Problems on Goodman ' s line		
25	modified goodman's line, Gerber's parabola		

**UNIT-III RIVETED AND WELDED JOINTS, KEYS, COTTERS AND KNUCKLE JOINTS**

**CO3: Design the riveted, welded, bolted joints , keys, cotters and knuckle joints subjected to static loads considering failure modes.**

**TB 1:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private Limited publications.**

26	design of joints with initial stresses	From: 24/08/23  To: 27/09/23	Lecture interspersed with discussions
27	eccentric loaded riveted joints		
28	design of bolts with pre-stresses		
29	design of joints under eccentric loading		
30	locking devices – bolts of uniform strength		
31	Problems on riveted joints		
32	Problems on welded joints		
33	Problems on bolted joints		
34	eccentric loaded welded joints		
35	<b>KEYS, COTTERS AND KNUCKLE JOINTS:</b> Introduction		
36	Design of keys		
37	stresses in keys		
38	cotter joints		
39	spigot and socket, sleeve and cotter		
40	jib and cotter joints- knuckle joints		
41	Problems on cotter joints		
42	Problems on knuckle joints		

**UNIT-IV SHAFTS & SHAFT COUPLINGS**

**CO4: Create the machine shafts and suggest suitable coupling for a given application.**

**TB 1:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private Limited publications.**

43	Design of solid and hollow shafts for strength and rigidity		
44	design of shafts for combined bending and axial loads		
45	shaft sizes— BIS code, Use of internal and external circlips		



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46	gaskets and seals, problems	From: 29/09/23  To: 26/10/23	Lecture interspersed with discussions
47	Problems on shafts		
48	Couplings : Introduction		
49	muff, split muff couplings		
50	rigid flanged coupling		
51	protected rigid flanged coupling,		
52	Marine type flanged coupling		
53	Bushed pin type flexible coupling		
54	Problems on flange couplings, Rigid couplings		
55	Problems on flexible couplings		

**UNIT-V MECHANICAL SPRINGS**

**CO5: Evaluating the stresses in different types of springs subjected to static loads and dynamic loads.**

**TB 1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3<sup>rd</sup> Edition, Tata McGraw Hill Education Private Limited publications.**

56	Stresses and deflections of helical springs	From: 27/10/23  To: 11/11/23	Lecture interspersed with discussions
57	Extension springs		
58	compression springs		
59	springs for fatigue loading		
60	energy storage capacity		
61	helical torsion springs		
62	co-axial springs		
63	leaf springs		
64	Problems on springs		
65	Problems on helical torsion springs		
66	Problems on leaf springs		
67	Problems on compression springs		
68	Problems on springs		

**TB 1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3<sup>rd</sup> Edition, Tata McGraw Hill Education Private Limited publications.**

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**TENTATIVE LESSON PLAN**

**Course/Code: ENVIRONMENTAL MANAGEMENT/ R203101J**

**Year / Semester : III/I**

**A.Y: 2023-24**

No. of Periods	TOPIC	Date	Mode of Delivery
<b>UNIT I ENERGY AND ENVIRONMENT</b>			
<b>CO1: Plan and design the water and wastewater systems, oil pollution, energy demand and sources of energy.</b>			
<b>TB 1 - "KVSG Murali Krishna, "Environmental studies", VGS Publications</b>			
1	Energy and Environment	<b>From:</b> <b>17-07-2023</b>  <b>To:</b> <b>11-08-2023</b>	Lecture interspersed with discussions, PPT
2	Definition- Energy demand		
3	Energy resources and generation of electricity		
4	conservation and management of energy resources		
5	Oil pollution		
6	Impact of oil pollution on marine and costal ecosystems		
7	Management of oil pollution		
8	Case study of oil pollution.		
9	Energy resources and generation of electricity		
10	conservation and management of energy resources		
11	Management of oil pollution		
<b>UNIT-II AGRICULTURE AND ENVIRONMENT</b>			
<b>CO2: Identify the source of emissions and select proper control systems.</b>			
<b>TB 1 - "Jacobson, M.Z. "Atmospheric Pollution: History, Science and Regulation", Cambridge University Press.</b>			
12	Agriculture and Environment	<b>From:</b> <b>14-08-2023</b>  <b>To:</b> <b>28-08-2023</b>	Lecture interspersed with discussions
13	Definition -Composition of soils		
14	soils for plant growth		
15	difference between sandy and clayey soils		
16	macro and micro nutrients for plant growth		
17	different types of agriculture		
18	Impact of agriculture on environment and people		



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19	causes for soil erosion		
20	management of soil erosion		
21	difference between sandy and clayey soils		
22	macro and micro nutrients for plant growth		
23	different types of agriculture		
<b>UNIT-III WATER MANAGEMENT</b> <b>CO3: Design &amp; estimation of water supply system for a city</b> <b>TB 1 - Jacobson, M.Z. "Fundamental of Atmospheric Modeling", Cambridge University Press.</b>			
24	Water Management	<b>From:</b> <b>30-08-2023</b>  <b>To:</b> <b>30-09-2023</b>	Lecture interspersed with discussions, Student Seminar
25	Water cycle		
26	global water distribution		
27	fresh water supply system		
28	water usage in different ways		
29	water quality and availability		
30	water pollution and its sources		
31	impact of water pollution		
32	managing pollution of fresh water		
33	water quality and availability		
34	fresh water supply system		
35	water pollution and its sources		
36	Managing water related diseases.		
<b>UNIT-IV ATMOSPHERIC POLLUTION</b> <b>CO4: Discuss the concepts to get knowledge about various environmental aspects.</b> <b>TB 2 - "KVSG Murali Krishna, "Environmental studies", VGS Publications.</b>			
37	Atmospheric Pollution	<b>From:</b> <b>03-10-2023</b>  <b>To:</b>	Lecture interspersed with discussions, PPT
38	Definition – atmosphere		
39	structure and composition of atmosphere		
40	natural greenhouse effect		
41	atmospheric pollution and its causes		
42	like smog, acid rain		
43	ozone layer depletion		
44	enhanced greenhouse effect		



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45	urban heat islands	19-10-2023	
46	impact of atmospheric pollution on humans, plants		
47	structure and composition of atmosphere		
48	natural greenhouse effect		
49	atmospheric pollution and its causes		
50	Managing of atmospheric pollution.		
<b>UNIT-V MANAGEMENT OF NATURAL HAZARDS</b> <b>CO5: Acquire knowledge about the natural hazards Earth quake and volcanoes, Flooding Drought and impact of natural hazards.</b> <b>TB 1 - "Jacobson, M.Z. "Atmospheric Pollution: History, Science and Regulation", Cambridge University Press.</b>			
51	Management of natural hazards:	From: 26-10-2023 To: 25-11-2023	Lecture interspersed with discussions
52	definition hazard and disaster		
53	Earth quake and volcanoes		
54	Flooding drought		
55	impact of natural hazards		
56	managing the impacts of natural hazards		
57	Opportunities presented by natural hazards.		
58	Earth quake and volcanoes		
59	hazard and disaster		
60	Opportunities presented by Natural hazards.		
61	managing the impacts of natural hazards		

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### TENTATIVE LESSON PLAN

**Course/Code:** Power Plant Engineering / R204103H

**Year / Semester:** IV/I

**Section:** I

**A.Y:** 2023-24

S.No	TOPIC	Date	Mode of Delivery
<b>UNIT-I STEAM POWER PLANT</b>			
<b>CO1: Analyze the working and layout of steam power plants and the different systems comprising the plant and discuss about its economic and safety impacts.</b>			
<b>TB: "POWER PLANT ENGINEERING", Er P.K.NAG.</b>			
1	Steam Power Plant Layout	<b>From:</b> 17/07/23  <b>To:</b> 09/08/23	Lecture interspersed with discussions, PPT.
2	Working of different circuits		
3	Fuel and handling equipment's		
4	Types of coals, Coal handling		
5	Choice of handling equipment		
6	Coal storage, ash handling systems		
7	Combustion properties of coal		
8	Overfeed and underfeed fuel beds		
9	Types of Stokers		
10	Pulverized fuel burning systems and its components		
11	Combustion needs and draught systems		
12	Cyclone furnace, design and construction		
13	Dust collectors, cooling towers and heat rejection		
14	Corrosion and feed water treatment		
<b>UNIT-II INTERNAL COMBUSTION &amp; GAS TURBINE POWER PLANTS</b>			
<b>CO2: Correlate the concepts of diesel engine &amp; evaluate the working principle of diesel &amp; gas power plant with its layout &amp; safety principles</b>			
<b>TB: "POWER PLANT ENGINEERING", Er P.K.NAG.</b>			
15	Internal combustion & Gas turbine power plants introduction	<b>From:</b> 10/08/23  <b>To:</b> 23/08/23	Lecture interspersed with discussions, Student Seminar
16	Introduction about diesel engines		
17	Plant layout with auxiliaries		
18	Fuel supply systems		
19	Air starting equipment,		
20	Supercharging		
	<b>Gas Turbine Power Plants</b>		
21	Gas turbine power plant, introduction		
22	Classification,		
23	construction layout with auxiliaries		
24	Combined cycle power plants and comparison		
25	Problems on Gas turbine plants		
<b>UNIT-III HYDRO ELECTRIC POWER PLANT &amp; HYDRO ELECTRIC PROJECTS, NUCLEAR POWER STATION &amp; TYPES OF REACTORS</b>			

**CO3: Demonstrate the conventional methods of hydroelectric power generation & discuss the projects involved with it & interpret the and basic principles of the nuclear power plant and the economic safety principles involved in it.**

**TB: "POWER PLANT ENGINEERING", Er Arora & Domkundwar.**

26	Hydro Electric Power Plant introduction	<b>From:</b> 24/08/23  <b>To:</b> 27/09/23	Lecture interspersed with discussions, Blended Learning
27	Water power		
28	Hydrological cycle/flow measurement		
29	Drainage area characteristics,		
30	hydrographs, storage and pondage		
31	Classification of dams and spill ways		
32	Hydroelectric projects and plant-classification, typical layouts		
33	Typical layouts		
34	Plant auxiliaries,		
35	Plant operation,		
36	Pumped storage plants		
37	Nuclear power station introduction		
38	Nuclear fuel, breeding and fertile materials		
39	Nuclear reactor, reactor operation		
40	Types of reactors-pressurized water reactors		
41	Boiling water reactor		
42	Sodium graphite reactor		
43	fast breeder reactor		
44	homogeneous reactor		

**UNIT-IV COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL**

**CO4: : Combine the working of various power plants & analyze the working of various instruments used for quality check & purification.**

**TB: "POWER PLANT ENGINEERING", Er P.C. SHARMA.**

45	Combined operations of different power plants-introduction	<b>From:</b> 29/09/23  <b>To:</b> 26/10/23	Lecture interspersed with discussions, PPT.
46	Advantages of combined working,		
47	Load distortion between power stations		
48	Storage type hydroelectric power plant		
49	Pumped storage plant		
50	Coordination of hydro electric and gas turbine plants		
51	Coordination of hydroelectric and nuclear stations		
52	Coordination of different types of power plants		
53	Power plant instrumentation and control		
54	Importance of power plant		
55	Instrumentation in power plant		
56	Measurement of gas purity		
57	Gas analysis, oxygen and carbon dioxide		
58	Measurements, nuclear measurements		

**UNIT-V POWER PLANT ECONOMICS & ENVIRONMENTAL CONSIDERATIONS**

**CO5: Estimate unit power cost under specified conditions & comprehend the impact of power plant on environment.**

**TB: "POWER PLANT ENGINEERING", Er P.C. SHARMA.**

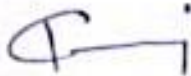
59	Power plant economics and environmental considerations		
60	Capital cost		
61	General arrangement of power distribution		
62	Load curves		
63	Load duration curve		

64	Definition of connected load	<b>From:</b> <b>27/10/23</b>	Lecture interspersed with discussions, Group discussion
65	Maximum demand		
66	Demand factor,		
67	Average load, Load factor		
68	Diversity factor		
69	Effluents from power plants		
70	Related exercises		
71	Impact on environment		
72	Load duration curve		
73	Definition of connected load		
74	Instrumentation in power plant	<b>To:</b> <b>16/11/23</b>	
75	Measurement of gas purity		

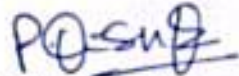
**TB 1: POWER PLANT ENGINEERING", Er P.C. SHARMA.**

**TB 2: POWER PLANT ENGINEERING", Er P.K.NAG.**

**TB 3: POWER PLANT ENGINEERING", Er Arora & Domkundwar.**



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## TENTATIVE LESSON PLAN

**Course/Code:** FUNDAMENTALS OF ELECTRIC VEHICLES / R204102M

**Year / Semester:** IV/I

**Section:** I

**A.Y:** 2023-24


S. No.	TOPIC	Date	Mode of Delivery
<b>UNIT-I INTRODUCTION</b>			
CO1: Illustrate different types of electric vehicles.			
TB: Electric and Hybrid Vehicles: Design Fundamentals by Iqbal Hussein, CRC Press, 2021.			
1	Fundamentals of vehicles	From: 17/07/2023  To: 05/08/2023	Lecture interspersed with discussions, PPT
2	Components of conventional vehicles		
3	Drawbacks of conventional vehicles		
4	Need for electric vehicles		
5	History of Electric Vehicles		
6	Types of Electric Vehicles		
7	Advantages and disadvantages of Electric Vehicles		
8	Applications of Electric Vehicles		
<b>UNIT-II COMPONENTS OF ELECTRIC VEHICLES</b>			
CO2: Select suitable power converters for EV applications.			
TB: Power Converters for Electric Vehicles by Kumar - L. Ashok - and S. Albert Alexander, CRC Press, 2020.			
9	Main components of Electric Vehicles	From: 07/08/2023  To: 31/08/2023	Lecture interspersed with discussions
10	Power Converters		
11	Controllers used in electric vehicles		
12	Electric Traction Motor used in EVs		
13	Rectifiers used in EVs		
14	Bidirectional DC-DC Converters		
15	Voltage Source Inverters		
16	PWM inverters used in EVs		
<b>UNIT-III HYBRID ELECTRIC VEHICLES</b>			
CO3: Design HEV configuration for a specific application.			
TB: Electric and hybrid vehicles by Denton – Tom, Routledge, 2020.			
17	Evolution of Hybrid Electric Vehicles		
18	Advantages of Hybrid Electric Vehicles		
19	Applications of Hybrid Electric Vehicles		



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20	Architecture of HEVs	<b>From:</b> 01/09/2023  <b>To:</b> 07/10/2023	Lecture interspersed with discussions, Student seminar
21	Series HEVs		
22	Parallel HEVs		
23	Complex HEVs		
24	Range extended HEVs		
25	Examples of HEVs – Case study 1		
26	Examples of HEVs – Case study 2		
<b>UNIT-IV MOTORS FOR ELECTRIC VEHICLES</b>			
<b>CO4:</b> Choose an effective method for EV and HEV applications.			
<b>TB:</b> Electric vehicle machines and drives: design - analysis and application by Chau - Kwok Tong, John Wiley & Sons, 2015.			
27	Characteristics of traction drive	<b>From:</b> 09/10/2023  <b>To:</b> 04/11/2023	Lecture interspersed with discussions
28	Requirements of electric machines for EVs		
29	Different motors suitable for Electric and Hybrid Vehicles		
30	Construction details and working of DC motors		
31	Construction details and working of brushless DC motors		
32	Construction details and working of Induction Motors		
33	Construction details and working of Synchronous Motors		
34	Construction details and working of Permanent Magnetic Synchronous Motors		
35	Construction details and working of Switched Reluctance Motors		
<b>UNIT-V ENERGY SOURCES FOR ELECTRIC VEHICLES</b>			
<b>CO5:</b> Analyse a battery management system for EV and HEV.			
<b>TB:</b> Batteries for electric vehicles: materials and electrochemistry by Berg – Helena, Cambridge university press, 2015.			
36	Batteries	<b>From:</b> 06/11/2023  <b>To:</b> 25/11/2023	Lecture interspersed with discussions
37	Types of Batteries		
38	Lithium-ion batteries		
39	Nickel-metal hydride batteries		
40	Lead-acid batteries		
41	Comparison of Batteries		
42	Battery Management System		

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43	Working of Ultra capacitors		
44	Working of Flywheels		
45	Working of Fuel Cell		
46	Applications of batteries		

  
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### TENTATIVE LESSON PLAN

Course/Code: Elements Of Civil Engineering /R204101T

Year/Semester: IV/I

Section: 1

A.Y: 2023-24

S.No	TOPIC	Date	Mode of Delivery
<b>UNIT-I scope of civil engineering and surveying</b> <b>CO1: student will be able to know the scope and importance of civil in engineering field and basic streams in that subject related field</b> <b>TB: " Surveying Vol. I&amp;II, Dr. B. C Punamia Laxmi Publications, Delhi.</b>			
1	Introduction	<b>From:</b> 17/07/23  <b>To:</b> 09/08/23	Lecture interspersed with discussions, PPT.
2	Impact of Infrastructural Development on the Economy of a Country		
3	Role of Civil Engineers, Importance of Planning		
4	Scheduling and Construction Management.		
5	Surveying: Introduction: Surveying and leveling		
6	object and uses		
7	Primary divisions,		
8	Fundamental principles		
9	Classification of surveying		
10	Plans and maps		
11	Scales		
12	Units of measure		
<b>UNIT- Compass surveying</b> <b>CO2: students are able to find the angles and measurements by using compass</b> <b>TB. Surveying Vol. I&amp;II, Dr. B. C Punamia Laxmi Publications, Delhi</b>			
13	Compass surveying: Types and uses of compass.	<b>From:</b> 10/08/23  <b>To:</b> 23/08/23	Lecture interspersed with discussions, Student Seminar
14	Bearings, Whole Circle Bearings, and Reduced Bearings		
15	Computation of angles, Meridians		
16	declinations and dip of needle		
17	Elevation measurements		
18	Leveling, object and uses, terms used in leveling		
19	leveling instruments		
20	methods of leveling		
<b>UNIT- III Construction Materials</b> <b>CO3: Demonstrate the conventional methods of hydroelectric power generation &amp; discuss the projects involved with it &amp; interpret the and basic principles of the nuclear power plant and the economic safety principles involved in it.</b> <b>TB: " Building Construction, Dr. B. C Punamia Laxmi Publications, Delhi</b>			
21	Construction Materials: Requirement		
22	types, uses.		
23	properties and importance of Civil Engineering materials		
24	Stone, Bricks, Lime		

25	Cement	From: 24/08/23	Lecture interspersed with discussions, Blended Learning
26	Ferrous and Non Ferrous Metals		
27	Ceramic Materials		
28	Timber		
29	Sand		
30	, , Aggregate		
31	. Mortar and Concrete		
32	Paints and Varnishes		
<b>UNIT- Planning&amp; Construction</b> <b>CO4::students are able to know the planning and construction and the basic requirements and know about the building bye laws</b> <b>TB:Building Construction, Dr. B. C Punamia Laxmi Publications, Delhi</b>			
33	Elementary principles	From: 29/09/23	Lecture interspersed with discussions, PPT.
34	basic requirements of a building planning.		
35	basic requirements of a building planning.		
36	layout of residential & industrial buildings		
37	layout of residential & industrial buildings		
38	layout of residential & industrial buildings		
39	Classification of buildings based upon occupancy and structure,		
40	Design Loads, Common building		
41	components, their functions, and nominal dimensions.		
42	Elements of building drawing		
43	Introduction to building byclaws		
<b>UNIT- V Water Resources Development</b> <b>CO5:student will be able know about the basic elements of hyrology and watere resources development.</b> <b>TB :Irrigation Engineering and Hydraulics Structures, Santosh Kumar Garg: Khanna Publishers Delhi.</b>			
44	Water Resources Development.	From: 27/10/23	Lecture interspersed with discussions, Group discussion
45	Elementary Hydrology		
46	Sources of water,		
47	Watershed Development		
48	water requirements and its conservation		
49	water requirements and its conservation		
50	water requirements and its conservation		

TB:“ . Surveying Vol. I&II, Dr. B. C Punamia Laxmi Publications, Delhi.

TB:“ Building Construction, Dr. B. C Punamia Laxmi Publications, Delhi.

TB :Irrigation Engineering and Hydraulics Structures, Santosh Kumar Garg: Khanna Publishers Delhi.

  
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**TENTATIVE LESSON PLAN**

**Course/Code: UNIVERSAL HUMAN VALUES-2: UNDERSTANDING HARMONY**

**Year / Semester: IV/I Section: I A.Y: 2023-24 Mode of Delivery: Onboard/PPT**

No. of Periods	TOPIC	Date	Remarks
<b>UNIT I – COURSE INTRODUCTION - NEED, BASIC GUIDELINES, CONTENT AND PROCESS FOR VALUE EDUCATION</b>			
<b>CO1: To train the student for Development of a holistic perspective based on self-exploration about themselves human being), family, society and nature/existence.</b>			
<b>TB :: "A foundational course in Human Values and Professional Ethics by RR Gaur, R Sangal, GP Bagaria , " Excel Books".</b>			
1	Introduction	From: 17-07-2023  To: 10-08-2023	Lecture Interspersed with discussions
2	Need ,Basic Guide lines for Value Education		
3	Content and Process for Value Education		
4	Introduction to Self-Exploration		
5	Self-Exploration content and process		
6	Personality Traits		
7	Self Excellence, Natural Acceptance" and Experiential Validation"		
8	The process for self-exploration		
9	Adaptability, Belief and Understanding- Self discipline		
10	Continuous Happiness and Prosperity		
11	A look at basic Human Aspirations		
12	Right understanding, Relationship and Physical Facility		
13	the basic requirements for fulfillment of aspirations of every human being with their correct priority		
14	Method to fulfill the above human aspirations		
15	Understanding and living in harmony at various levels.		
16	Myers-Briggs Type Indicator (MBTI) Personality test		
<b>UNIT –II UNDERSTANDING HARMONY IN THE HUMAN BEING - HARMONY IN MYSELF!</b>			
<b>CO2: To understand Harmony in the Human Being - characteristics and activities and harmony in I and correct appraisal of Physical needs, meaning of Prosperity in detail.</b>			
<b>TB :: "A foundational course in Human Values and Professional Ethics by RR Gaur, R Sangal, GP Bagaria , " Excel Books".</b>			
17	Introduction Understanding Harmony in the Human Being	From: 14-08-2023  To: 31-08-2023	Lecture Interspersed with discussions
18	Understanding human being as a co-existence of the sentient "I" and the material „Body"		
19	Understanding the needs of Self (I) and Body " - happiness and physical facility"		
20	Understanding the Body as an instrument of I		
21	I being the doer, seer and enjoyer		
22	Habits and Hobbies		
23	SWOT Analysis (Activity)		
24	Understanding the characteristics and activities of I		
25	Harmony in I		

26	Dalai Lamas" Tibetan Personality Test"		
27	.Understanding the harmony of I with the Body		
28	Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail		
29	Programs to ensure Sanyam and Health		
30	Epidemiology- Definition of health, Social and Preventive Medicine, Personal hygiene and handling stress		
31	WHO Guidelines		
<b>UNIT – III UNDERSTANDING HARMONY IN THE FAMILY AND SOCIETY- HARMONY IN HUMAN RELATIONSHIP</b> <b>CO3: To understand (or develop clarity) the harmony in the human being, family, society and Human Relationship</b> <b>TB :: "A foundational course in Human Values and Professional Ethics by RR Gaur, R Sangal, GP Bagaria " Excel Books".</b>			
32	Introduction Understanding Harmony in the Family and Society	From: 01-09-2023  To: 26-09-2023	Lecture Interspersed with discussions
33	Harmony in Human-Human Relationship		
34	Understanding values in human-human relationship		
35	meaning of Justice, Trust and Respect as the foundational values of relationship		
36	Understanding the meaning of Trust; Difference between intention and competence		
37	Understanding the meaning of Respect, Difference between respect and differentiation		
38	The other salient values in relationship, Friends and Foes, Empathy, False Prestige.		
39	Concept of an Ideal family- Marriage as an Institution		
40	Understanding the harmony in the society		
41	Visualizing a universal harmonious order in society		
42	Undivided Society, Universal Human Order- from family to world family.		
<b>UNIT – IV : UNDERSTANDING HARMONY IN THE NATURE AND EXISTENCE - WHOLE EXISTENCE AS COEXISTENCE</b> <b>CO4: To strengthen the students in Understanding Existence as Co-existence of mutually interacting units in all- pervasive space, Holistic perception of harmony at all levels of existence.</b> <b>TB :: "A foundational course in Human Values and Professional Ethics by RR Gaur, R Sangal, GP Bagaria , " Excel Books".</b>			
43	Introduction to Understanding Harmony in the Nature and Existence	From: 27-09-2023  To: 18-10-2023	Lecture Interspersed with discussions
44	Whole existence as Coexistence		
45	Understanding the harmony in the Nature and its Equanimity		
46	Respect for all, Nature as Teacher		
47	Interconnectedness and mutual fulfillment among the four orders of nature		
48	Recyclability and self-regulation in nature		
49	Understanding Existence as Co-existence of mutually interacting units in all		
50	pervasive space		
51	Holistic perception of harmony at all levels of existence.		
52	practice sessions		

**UNIT – V IMPLICATIONS OF THE ABOVE HOLISTIC UNDERSTANDING OF HARMONY ON PROFESSIONAL ETHICS**

**COS: To Infuse the student with Humanistic Education, Humanistic Constitution and Humanistic Universal Order**

**TB :: "A foundational course in Human Values and Professional Ethics by RR Gaur, R Sangal, GP Bagaria " Excel Books".**

53	Implications of the above Holistic Understanding of Harmony on Professional Ethics	From: 19-10-2023  To: 11-11-2023	Lecture Interspersed with discussions
54	Natural acceptance of human values		
55	Definitiveness of Ethical Human Conduct		
56	Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order		
57	Competence in professional ethics		
58	Case studies of typical holistic technologies, management models and production systems		
59	Vision for the Holistic alternatives, UHVs for entrepreneurship		
60	Strategy for transition from the present state to Universal Human Order		
61	(a) At the level of individual(b) At the level of society		
62	practice sessions and Case Studies		

M. Sonjanya 17/07/23  
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