



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
UNIT-I SIMPLE STRESSES & STRAINS			
CO1: Model & Analyze the behavior of basic structural members subjected to various loading and support conditions based on principles of equilibrium.			
TB: Strength of materials /GH Ryder/ Mc Millan publishers IndiaLtd.			
UNIT-I			
1	SIMPLE STRESSES & STRAINS: Elasticity and plasticity	From: 05-09-2022 To: 22-09-2022	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		
UNIT-II SHEAR FORCE AND BENDING MOMENT			
CO2: 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.			
TBI: Strength of materials /GH Ryder/ Mc Millan publishers IndiaLtd..			
UNIT-II			
13	Definition of beam – Types of beams	From: 23-09-2022 To: 15-10-2022	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: 18-10-2022 To: 04-11-2022	Lecture interspersed with discussions, Revision Practice Tests
24	Assumptions – Derivation of bending equation: $M/I = \ell/y = E/R$		
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: 05-11-2022 To: 06-12-2022	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: 07-12-2022 To: 24-12-2022	Lecture interspersed with discussions, Student seminars
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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TENTATIVE LESSON PLAN

Course/Code: FLUID MECHANICS & HYDRAULIC MACHINES / R2021032

Year / Semester: II/I

Section: I

A.Y: 2022-23

S. No.	TOPIC	Date	Mode of Delivery
UNIT-I FLUID STATICS, BUOYANCY AND FLOATATION CO1: Determine the fluid pressure and use various devices for measuring fluid pressure. TB: 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	From: 05/09/2022 To: 20/09/2022	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		
UNIT-II FLUID KINEMATICS, FLUID DYNAMICS AND CLOSED CONDUIT FLOW CO2: Apply general governing equations for various fluid flows and analyse the losses in pipes. TB: 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	From: 21/09/2022 To: 18/10/2022	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		
UNIT-III BOUNDARY LAYER THEORY, DIMENSIONAL ANALYSIS CO3: Identify the boundary layer theory, flow separation, and examine dimensionless numbers. TB: Fluid Mechanics and Hydraulic Machines - RK Bansal- Laxmi Publications (P) Ltd.			
32	Introduction: Boundary layer, Boundary layer formation over flat plate	From: 19/10/2022 To: 02/11/2022	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		
UNIT-IV BASICS OF TURBOMACHINERY, HYDRAULIC TURBINES CO4: Apply momentum principles to the impact of jets and evaluate their performance, as well as hydraulic turbine performance. TB: Fluid Mechanics and Hydraulic Machines - RK Bansal- Laxmi Publications (P) Ltd.			
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	From: 03/11/2022 To: 18/11/2022	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.

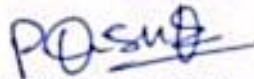
TB: Fluid Mechanics- Fundamentals and Applications by Y.A. Cengel, J.M.Cimbala, 6th Edn, McGraw-Hill

50	Geometric similarity	From: 19/11/2022 To: 17/12/2022	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		
67	Revision of Unit - I		
68	Revision of Unit - II		
69	Revision of Unit - III		

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70	Revision of Unit - IV		
71	Revision of Unit - V		


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TENTATIVE LESSON PLAN: R2021033 PRODUCTION TECHNOLOGY

Course Title: PRODUCTION TECHNOLOGY	Course Code: R2021033
Date: 03-09-2022	Page No: 01 of 03
Revision No: 00	Prepared By: P. Bhagya Lakshmi
	Approved By: HOD

Tools: Black board, PPT's


No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I CASTING			
CO1: Design the patterns and core boxes for metal casting processes			
TBI: " Manufacturing Technology -Vol I- P.N. Rao- TMH.			
1	Steps involved in making a casting	From: 05/09/22 To: 19/09/22	Lecture interspersed with discussions
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.		
UNIT-II GATING SYSTEMS, MELTING FURNACES & TYPES OF CASTINGS			
CO2: Design the gating system for different metallic components			
TBI: " Manufacturing Technology -Vol I- P.N. Rao- TMH.			
13	Principles of Gating	From: 21/09/22 To: 01/10/22	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		
UNIT-III WELDING			
CO3: Illustrate and classify different types of welding processes used for special fabrication			
TB2:“ Production Technology- R.K. Jain- Khanna			
26	Classification of welding processes,	From: 10/10/22 To: 16/11/22	Lecture interspersed with discussions
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		
UNIT-IV BULK FORMING PROCESSES			
CO4: Use forging, rolling and extrusion processes			
TB2:“ Production Technology- R.K. Jain- Khanna .			
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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54	Types Forging- Smith forging, Drop Forging	From: 17/11/22 To: 03/12/22	Lecture interspersed with discussions
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		

UNIT-V SHEET METAL FORMING PROCESSES
CO5 : Understand and apply various sheet metal forming processes
TB2:“ Production Technology- R.K. Jain- Khanna .


65	Sheet metal forming - Blanking and piercing	From: 05/12/22 To: 17/12/22	Lecture interspersed with discussions
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: R2021034
KINEMATICS OF MACHINERY**


Course Title: KINEMATICS OF MACHINERY		R2021034
Section : Sec I	Date : 5-9-2022	Page No : 01 of 05
Revision No : 00	Prepared By : BALA CHINALINGAM VANAM	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I MECHANISMS			
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.			
TB1: Theory of Machines – S. S Rattan- TMH Publishers.			
TB2: Theory of machines / Khurmi / S.Chand.			
1	Elements or Links – Classification – Rigid Link, flexible and fluid link	05-09-2022 TO 14-09-2022	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	Khubralrs 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		

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	chains.		
<p align="center">UNIT-II LOWER PAIR MECHANISM</p> <p>CO2: The objective of this unit is to make student understand various mechanisms for straight line motion and their applications including steering mechanism.</p> <p>TB1: Theory of Machines – S. S Rattan- TMH Publishers.</p> <p>TB2: Theory of machines / Khurmi / S.Chand.</p>			
9	Exact and approximate copiers and generated types – Peaucellier	<p align="center">15-09-2022 TO 25-09-2022</p>	<p align="center">Lecture interspersed with discussions, PPT</p>
10	Hart and Scott Russel – Grasshopper – Watt T. Chebicheff		
11	Robert Mechanisms and straight line motion, Pantograph		
12	Conditions for correct steering – Davis Steering gear		
13	Ackermans steering gear		
14	velocity ratio; Hooke's Joint: Single and double		
15	Universal coupling-application-problems.		
<p align="center">UNIT-III KINEMATICS</p> <p>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.</p> <p>TB1: Theory of Machines – S. S Rattan- TMH Publishers.</p> <p>TB2: Theory of machines / Khurmi / S.Chand.</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		

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	chain.	27-09-2022 TO 14-10-2022	Lecture interspersed with discussions
19	Velocity and acceleration analysis of for a given mechanism		
20	Kleins construction, Coriolis acceleration, determination of Coriolis component of acceleration.		
21	Plane motion of body; Instantaneous center of rotation,centroids and axodes		
23	Graphical determination of instantaneous centre		
24	diagrams for simple mechanisms and determination of angular velocity of points and links		


UNIT-IV CAMS

CO4: The objective of this unit is to make student understand the theories involved in cams.

TB1: Theory of Machines – S. S Rattan- TMH Publishers.

TB2: Theory of machines / Khurmi / S.Chand.

25	Definitions of cam and followers – their uses	15-10-2022 TO 27-10-2022	Lecture interspersed with discussions, student seminar
26	Types of followers and cams		
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		

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34	concave and convex flanks		
UNIT-V GEARS, GEAR TRAINS 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. TB1: Theory of Machines – S. S Rattan- TMH Publishers. TB2: Theory of machines / Khurmi / S.Chand.			
35	Higher pairs, friction wheels	28-10-2022 TO 18-11-2022	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		



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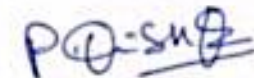
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48	Belt and rope drives		
49	Selection of belt drive		
50	Types of belt drives		
51	V-belts		
52	Materials used for belt and rope drives		
53	Velocity ratio of belt drives		
54	Slip of belt, creep of belt		
55	Tensions for flat belt drive		
56	Angle 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: Thermal Engineering-II / R2031031

Year / Semester : III/I

A.Y: 2022-23

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I BASIC CONCEPTS, BOILERS			
CO1: Comprehend the concept of Rankine cycle. Interpret working of boilers including water tube, fire tube and high pressure boilers and determine efficiencies.			
TB I - "THERMAL ENGINEERING-II", PAKIRAPPA.			
1	Rankine cycle - schematic layout	From: 01-08-2022 To: 07-09-2022	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	Problem		
UNIT-II STEAM NOZZLES & STEAM TURBINES			
CO2: Analyze the flow of steam through nozzles. Evaluate the performance steam turbines.			
TB I - "THERMAL ENGINEERING-II", PAKIRAPPA.			
26	STEAM NOZZLES :Function of a nozzle -		



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	applications - types,		
27	Flow through nozzles, thermodynamic analysis – assumptions	From: 08-09-2022 To: 24-09-2022	Lecture interspersed with discussions
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	STEAM TURBINES: 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		

UNIT-III REACTION TURBINE & STEAM CONDENSERS
CO3: Evaluate the performance of reaction turbines and steam condensers.
TB 1 - "THERMAL ENGINEERING-II", PAKIRAPPA.

39	REACTION TURBINE: Mechanical details – principle of operation	From: 10-10-2022 To: 20-10-2022	Lecture interspersed with discussions, Student Seminar
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	STEAM CONDENSERS: 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		


UNIT-IV COMPRESSORS, RECIPROCATING, ROTARY
CO4: Discuss the concepts of reciprocating and rotary type of compressors.
TB 2 - "THERMAL ENGINEERING-I", PAKIRAPPA.




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49	Compressors: classification	From: 21-10-2022 To: 10-11-2022	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	From: 14-11-2022 To: 26-11-2022	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: R2031032 DESIGN OF MACHINE MEMBERS-I

Course Title: DESIGN OF MACHINE MEMBERS-I		Course code: R2031032	
Date: 30/07/22		Page No: 01 to 03	
Revision No : 00	Prepared By: P. Bhagya Lakshmi	Approved By: HOD	
Tools: Black Board, PPT's			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION, STRESSES IN MACHINE MEMBERS 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 TB 1: "DESIGN OF MACHINE ELEMENTS", V.B. BHANDARI, 3 rd Edition, Tata McGraw Hill Education Private Limited publications.			
1	General considerations in the design of Engineering Materials	From: 01/08/22 To: 24/08/22	Lecture interspersed with discussions
2	Mechanical properties, Manufacturing consideration in design		
3	Tolerances and fits		
4	BIS codes of steels, ASHBY Charts		
5	STRESSES IN MACHINE MEMBERS: Simple stresses		
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		
UNIT-II STRENGTH OF MACHINE ELEMENTS CO2: Calculate dynamic stresses in the machine components subjected to variable loads. TB 1: "DESIGN OF MACHINE ELEMENTS", V.B. BHANDARI, 3 rd Edition, Tata McGraw Hill Education Private Limited publications.			
14	Stress concentration		
15	theoretical stress concentration factor		
16	fatigue stress concentration factor, notch sensitivity		



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17	design for fluctuating stresses	From: 25/08/22 To: 09/09/22	Lecture interspersed with discussions
18	endurance limit, estimation of endurance strength		
19	Problems on Stress concentration factor		
20	Problems on endurance limit		
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, 3rdEdition, Tata McGraw Hill Education Private Limited publications.

26	design of joints with initial stresses	From: 12/09/22 To: 22/10/22	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	KEYS, COTTERS AND KNUCKLE JOINTS: 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, 3rdEdition, 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		



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45	shaft sizes— BIS code, Use of internal and external circlips	From: 25/10/22 To: 14/11/22	Lecture interspersed with discussions
46	gaskets and seals, problems		
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, 3rd Edition, Tata McGraw Hill Education Private Limited publications.

56	Stresses and deflections of helical springs	From: 15/11/22 To: 26/11/22	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, 3rd Edition, Tata McGraw Hill Education Private Limited publications.

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TENTATIVE LESSON PLAN

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

Year / Semester : III/I

Section: I

A.Y: 2022-23

S.No	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION CO1: Discuss the concepts of machining processes. TB 1 : "Workshop technology", B.S Raghuwanshi, Vol. II , Dhanpat Rai & Co. (p) Ltd.,			
1	Elementary treatment of metal cutting	From: 01/08/2022 To: 22/08/2022	Lecture interspersed with discussions, Student Seminar
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		
UNIT-II LATHE MACHINES, SHAPING, SLOTTING & PLANNING MACHINES CO2: Apply the principles of lathe, shaping, slotting and planning machines. TB 1 : "Workshop technology", B.S Raghuwanshi, Vol. II , Dhanpat Rai & Co. (p) Ltd.,			
15	Principle Of working, specification of lathe		
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		
22	Principal features of automatic lathes		
23	Classification of automatic lathes, single		



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24	spindle and multi-spindle automatic lathes Tool layout and cam design for automats and problems	From: 22/08/2022 To: 13/09/2022	Lecture interspersed with discussions
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 Raghuwanshi, Vol. II , Dhanpat Rai & Co. (p) Ltd.,

32	Principles of working, specifications, types of drilling machines	From: 16/09/2022 To: 17/10/2022	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 Raghuwanshi, Vol. II , Dhanpat Rai & Co. (p) Ltd.,

45	Theory of grinding, Classification of grinding machines	From: 18/10/2022 To: 07/11/2022	Lecture interspersed with discussions, PPT
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	SYSTEMS OF LIMITS AND FITS: 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		

UNIT-V SURFACE ROUGHNESS MEASUREMENT & OPTICAL MEASURING INSTRUMENTS

CO5: Apply the knowledge about the concepts of surface roughness and optical measuring instruments.

TB 2: " A textbook of metrology", M. Mahajan, 4th Edition, Elsevier.

59	Differences between surface roughness and surface waviness	From: 08/11/2022 To: 26/11/2022	Lecture interspersed with discussions, Group discussion
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,		



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66	Construction , merits		
67	Demerits and their uses of Optical flats		
68	Optical comparators		

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

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DATA STRUCTURES

Course Title: Data Structures		Course code: R203105F	
Date :01/08/2022		Page No : 01 to 04	
Revision No : 00	Prepared By: Dr.A.STANLY KUMAR	Approved By : HOD	
Tools: BLACK BOARD, PPTs			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO DATA STRUCTURES CO1: Summarize the proerties ,interfaces,and behaviors of basic abstrat data types TB 1 : Data Structures and Algorithm Analysis 4th edition, Mark Allen Weiss,Pearson.,			
1	Abstact Data Types(ADTs)	From: 01/08/2022 To: 20/08/2022	Lecture interspersed with discussions, Student Seminar
2	The Linked Lists		
3	The List ADT		
4	Simple Array Implementation of Lists		
5	Circularly Linked Lists		
6	The Stack ADT		
7	The Stack Model		
8	Implementation of Stacks		
9	Application of Stack.		
10	The Queue ADT		
11	Queue Model		
12	Array implementation of Queues		
13	Application of Queues		
14	Stack and Queue implementation using linked list.		
UNIT-II SEARCHING CO2: Discuss the computational efficiency of the principal algorithms for sorting & Searching TB 1 : Data Structures and Algorithm Analysis 4th edition, Mark Allen Weiss,Pearson.,			
15	List Searches,Linear	From: 22/08/2022	Lecture interspersed
16	Binary Search Methods		
17	Sorting		
18	Selection Sort		
19	Insertion Sort		
20	Quick Sort		
21	Merge Sort		
22	Heap Sort		
23	Hashing		
24	Hash Function		
25	Separate Chaining		
26	Collision Resolution		
27	Separate Chaining		



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		To: 12/09/2022	with discussions, Blended learning
UNIT-III TREES CO3: Use Trees, Binary Trees and its implementations. TB 1 Data Structures and Algorithm Analysis 4th edition, Mark Allen Weiss, Pearson.,			
28	Introduction to Trees	From: 13/09/2022 To: 17/10/2022	Lecture interspersed with discussions
29	Binary Trees		
30	Implementation		
31	Expression Trees		
32	Binary Search Trees		
33	Find Min		
34	Find Max		
35	Insert operations		
36	Delete operations		
UNIT-IV TREES CO4: Discuss Trees and AVL Trees, B-Trees. TB 1 : Data Structures and Algorithm Analysis 4th edition, Mark Allen Weiss, Pearson.,			
37	Trees	From: 18/10/2022 To: 07/11/2022	Lecture interspersed with discussions, PPT
38	AVL Trees		
39	Single Rotation		
40	Double Rotation		
41	Operations		
42	B-Tree		
43	Searching		
44	Insertion		
45	Deletion		
UNIT-V TREES, PRIORITY QUEUES			



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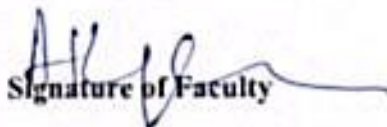
CO5: Demonstrate different methods of Trees and Priority Queues.

TB 2: Data Structures and Algorithm Analysis 4th edition, Mark Allen Weiss, Pearson.,

46	Introduction to Red-Black	From: 09/11/2022 To: 26/11/2022	Lecture interspersed with discussions, Group discussion
47	Splay Trees		
48	Comparison of Search Trees		
49	Priority Queues		
50	Priority Queue Model		
51	Simple Implementations		

TB 1 : Data Structures and Algorithm Analysis 4th edition, Mark Allen Weiss, Pearson.,

TB 2: Data Structures : A PseudoCode Approach with C, 2nd Edition ,Richard F. Gilberg & Behrouz A. Forouzan, Cengage.


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TENTATIVE LESSON PLAN

Course/Code: FINITE ELEMENT METHODS / R1941032

Year / Semester : IV/I

Section: I

A.Y: 2022-23

S.No	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION CO1: Analyze the concepts behind variational methods and weighted residual methods in FEM. TB: "The Finite Element Methods in Engineering", SS Rao, 4th Edition, Elsevier.			
1	Introduction to finite element method	From: 04/07/2022 To: 04/08/2022	Lecture interspersed with discussions
2	stress and equilibrium		
3	strain – displacement relations		
4	stress – strain relations		
5	plane stress and plane strain conditions		
6	variational and weighted residual methods		
7	concept of potential energy		
8	Rayleigh-Ritz method		
9	problems		
10	problems		
11	Element stiffness matrix for 1-D Problems		
12	Strain displacement matrix derivation		
13	Problems on 1-D Bar element		
14	Elimination approach & penalty approach		
15	Discretization of domain element shapes		
16	Derivation of element shapes		
17	Discretization procedures, assembly of stiffness matrix		
18	Band width, node numbering, mesh generation		
19	Interpolation functions, problems		
20	Local and global coordinates		
21	convergence requirements, problems		
22	Treatment of boundary conditions, problems		
23	Problems		
UNIT-II ANALYSIS OF TRUSSES & BEAMS CO2: Identify the application and characteristics of FEA elements such as trusses, beams, plane and isoparametric elements, and 3-D element. TB: "The Finite Element Methods in Engineering", SS Rao, 4th Edition, Elsevier.			
24	Analysis of trusses, Derivation of element stiffness matrix		
25	Finite element modelling, coordinates and shape functions		



26	Derivation of strain displacement matrix and shape functions	From: 06/08/2022 To: 20/08/2022	Lecture interspersed with discussions, PPT
27	Assembly of global stiffness matrix and derivation of load vector		
28	Treatment of boundary conditions, stress & strain		
29	Support reactions calculations		
30	Problem on Trusses		
31	Problem on Trusses		
32	Analysis of Beams: Derivation of elements, stiffness matrix for Hermite		
33	Derivation of load vector for point UDL load		
34	Derivation of load vector & Assembly stiffness matrix		
35	Problems on beams		
36	Problems on beams with UDL		
37	Concept of frames		
38	Problems on beams		
39	Problems on frames		
40	Problems on frames		

UNIT-III ANALYSIS OF TWO DIMENSIONAL ELEMENTS

CO3: Develop element characteristic equation procedure and generation of global stiffness equation will be applied.

TB: "The Finite Element Methods in Engineering", SS Rao, 4th Edition, Elsevier.

41	Finite element modeling with CST	From: 22/08/2022 To: 17/09/2022	Lecture interspersed with discussions, PPT
42	Element stiffness matrix for CST element		
43	Strain displacement matrix for CST		
44	treatment of boundary conditions		
45	problem		
46	problem		
47	formulation of axisymmetric problems		
48	problem		
49	Problems		

UNIT-IV HIGHER ORDER AND ISOPARAMETRIC ELEMENTS

CO4: Apply Suitable boundary conditions to a global structural equation, and reduce it to a solvable form.

TB: "The Finite Element Methods in Engineering", SS Rao, 4th Edition, Elsevier.

50	One dimensional quadratic element in natural coordinates	From: 19/09/2022 To: 22/09/2022	Lecture interspersed with discussions
51	One dimensional cubic element in natural coordinates		
52	Two dimensional four noded isoparametric elements		
53	Numerical integration		
54	Problems quadratic element		



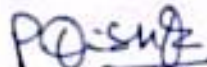
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55	Problems cubic element		
UNIT-V STEADY STATE HEAT TRANSFER & DYNAMIC ANALYSIS			
CO5: Identify how the finite element method expands beyond the structural domain, for problems involving dynamics, heat transfer, and fluid flow.			
TB: "The Finite Element Methods in Engineering", SS Rao, 4th Edition, Elsevier.			
56	One dimensional analysis of a fin	From: 24/09/2022 To: 29/10/2022	Lecture interspersed with discussions, Student Seminar
57	Two dimensional analysis of thin plate		
58	Analysis of a uniform shaft subjected to torsion		
59	Dynamic Analysis: Formulation of finite element model		
60	Element consistent and lumped mass matrices		
61	Evaluation of Eigen values		
62	Evaluation of Eigen vectors		
63	Free vibration analysis		
64	Problems on fins		
65	Problems on thin plate		
66	Problems on shaft subjected to torsion		
67	Problems on lumped mass matrices		
68	Problems on Eigen values & Eigen vectors		
69	Problems		
70	problems		
71	problems		

TB: "The Finite Element Methods in Engineering", SS Rao, 4th Edition, Elsevier.



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**TENTATIVE LESSON PLAN: R1941033C
 PRODUCTION PLANNING AND CONTROL**

Course Title: PRODUCTION PLANNING AND CONTROL		Course code: R1941033C	
Section : Sec I	Date :04/07/2022	Page No : 01 to 04	
Revision No : 00	Prepared By: V. BALA CHINALINGAM	Approved By : HOD	
Tools: BLACK BOARD, PPTs			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I-INTRODUCTION CO1: Understanding of the concepts of production and service systems. TB 1: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp. TB 2: "Production Planning Control & Industrial Management", K.C Jain, L.N. Aggarwal, Khanna Publishers .			
1	Definition	04-07-2022 TO 16-07-2022	Lecture interspersed with discussions
2	Objectives of production planning and control		
3	Functions of production planning and control		
4	Scope of production planning and control		
5	Differentiate between production planning & production control		
6	Phases of PPC		
7	Elements of production control		
8	Advantages & Disadvantages of PPC		
9	Types of production		
10	Characteristics of different types of production systems		
11	Organization of production planning and control department		
12	Internal organization of department		
UNIT-II FORECASTING CO2: Applying of principles and techniques in the design, planning and control of these systems to optimise/make best use of resources in achieving. TB 1: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp. TB 2: "Production Planning Control & Industrial Management", K.C Jain, L.N. Aggarwal, Khanna Publishers .			
13	Objectives of Forecasting		Lecture interspersed
14	Process of Forecasting		

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15	Importance of forecasting	18-07-2022 TO 10-08-2022	with discussions, student seminar
16	types of forecasting		
17	Uses of forecasting		
18	Demand or sales forecasting		
19	Factors influencing sales forecasting		
20	general principles of forecasting		
21	forecasting techniques		
22	Qualitative methods and quantitative methods.		
23	Correlation Analysis, Problems		
24	Differences between Qualitative and Quantitative methods		
25	Previous questions.		

UNIT-III INVENTORY MANAGEMENT

CO3: Finding different strategies employed in manufacturing and service industries.

TB 1: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp.

TB 2: "Production Planning Control & Industrial Management", K.C Jain, L.N. Aggarwal, Khanna Publishers .


26	Definition of Inventory management	11-08-2022 TO 25-08-2022	Lecture interspersed with discussions, PPT
27	Procedure of Inventory management and control		
28	functions of inventories, relevant inventory costs		
29	Different methods of inventory control techniques		
30	ABC analysis, Problems on ABC analysis		
31	VED analysis, Expression for EOQ model, Problems on EOQ model		
32	Various systems available for inventory control		
33	Differentiate between P-system and Q-system		
34	Introduction to MRP-I & MRP-II		
35	Concept of ERP system, Line of balance		
36	Scope of ERP and difficulties in implementation		
37	Just-In-Time inventory, Kanban System		

UNIT-IV CAPACITY PLANNING

CO4: Applying and improved capacity planning and control methods for different production systems.

TB 1: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp.

TB 2: "Production Planning Control & Industrial Management", K.C Jain, L.N. Aggarwal, Khanna Publishers .

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38	Definition.		Lecture interspersed with discussions
39	Routing procedure		
40	Factors affecting routing procedure	05-09-2022 TO 20-09-2022	
41	Route sheets		
42	Bill of material		
43	Term schedule & scheduling		
44	Forward and backward scheduling		
45	Difference between loading & scheduling		

UNIT-V MATERIAL REQUIREMENT PLANNING

CO5: Applying and improved planning and control methods for different production systems.

TB 1: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp.

TB 2: "Production Planning Control & Industrial Management", K.C Jain, L.N. Aggarwal, Khanna Publishers .

46	Introduction		Lecture interspersed with discussions
47	Material Requirement Planning		
48	Material Requirement Planning Problems	22-09-2022 TO 15-10-2022	
49	standard scheduling methods		
50	Master Production Schedule		
51	Line Balancing		
52	Aggregate planning		
53	chase planning		
54	Expediting		
55	Master Production Schedule		
56	Controlling aspects		
57	Dispatching		


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 DEPARTMENT OF MECHANICAL ENGINEERING

SRKIT / ME / 97

TENTATIVE LESSON PLAN

Course/Code: Power Plant Engineering / R191034C

Year / Semester: IV/I

Section: I

A.Y: 2022-23

S.No	TOPIC	Date	Mode of Delivery
UNIT-I STEAM POWER PLANT			
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.			
TB: "POWER PLANT ENGINEERING", Er P.K.NAG.			
1	Steam Power Plant Layout	From: 04/07/22 To: 13/07/22	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		
UNIT-II INTERNAL COMBUSTION & GAS TURBINE POWER PLANTS			
CO2: Correlate the concepts of diesel engine & evaluate the working principle of diesel & gas power plant with its layout & safety principles			
TB: "POWER PLANT ENGINEERING", Er P.K.NAG.			
15	Internal combustion & Gas turbine power plants introduction	From: 14/07/22 To: 04/08/22	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		
Gas Turbine Power Plants			
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		
UNIT-III HYDRO ELECTRIC POWER PLANT & HYDRO ELECTRIC PROJECTS, NUCLEAR POWER STATION & TYPES OF REACTORS			
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	From: 06/08/22 To: 20/08/22	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	From: 05/09/22 To: 14/09/22	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		
65	Maximum demand		

66	Demand factor,	From: 15/09/22 To: 27/09/22 Lecture interspersed with discussions, Group discussion
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	
75	Measurement of gas purity	

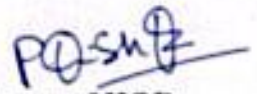
TB 1: POWER PLANT ENGINEERING", Er P.C. SHARMA.

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

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



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SRKIT / ME / 97

TENTATIVE LESSON PLAN

Course/Code: Fundamentals Of Utilization Of Electrical Energy / R194102N

Year / Semester : IV/I

A.Y: 2022-23

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I SOURCES OF ELECTRICAL ENERGY			
CO1 : Interpret the concepts of various sources of electrical energy and its generation technologies for conventional and non-conventional energy sources.			
TB: Electrical Power Systems(Generation, Transmission, Distribution, Protection and Utilization of Electrical Energy) – Dr. S.L.Uppal and Prof. Sunil S.Rao – Khanna Publisher, 15th edition, 1987.			
1	Conventional Sources: Schematic & description of components of thermal power plant	From: 04-07-2022 To: 16-07-2022	Lecture interspersed with discussions, PPT
2	Conventional Sources: Schematic & description of components of thermal power plant		
3	Hydro electric power station		
4	Nuclear power plants		
5	Non-conventional sources: schematic and description of components - Solar power generation -		
6	Non-conventional sources: schematic and description of components - Solar power generation -		
7	Wind power generation		
8	Tidal energy		
9	Geo-Thermal energy		
10	Bio energy		
11	Fuel cells technology		
UNIT-II ILLUMINATION			
CO2 : Explain the concepts of various types of illumination equipment, illumination measurement and illumination techniques.			
TB: Electrical Power Systems(Generation, Transmission, Distribution, Protection and Utilization of Electrical Energy) – Dr. S.L.Uppal and Prof. Sunil S.Rao – Khanna Publisher, 15th edition, 1987.			
12	Introduction	From: 18-07-2022 To: 30-07-2022	Lecture interspersed with discussions
13	Source of light		
14	Term used in illumination		
15	Term used in illumination		
16	Lux meter - Discharge lamp		
17	MV and SV lamps		
18	Types and design of light as flood light		
19	Types and design of light as flood light		



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20	LED light		
21	Shed lighting		
22	Domestic light		
23	Conservation of energy		
UNIT-III HEATING AND WELDING CO3 : Comprehend the phenomena about various methods used for electrical energy based heating and welding applications. TB: Electrical Power Systems(Generation, Transmission, Distribution, Protection and Utilization of Electrical Energy) – Dr. S.L.Uppal and Prof. Sunil S.Rao – Khanna Publisher, 15th edition, 1987.			
24	Advantages of Electric heating	From: 01-08-2022 To: 12-09-2022	Lecture interspersed with discussions, Student Seminar
25	Types of electric heating		
26	Resistance Heating - properties of heating element		
27	Direct heating - indirect heating		
28	Induction heating - Factors effecting heat – Characteristics – application		
29	Description of direct core - vertical core		
30	Indirect core and core less type of Induction heating		
31	Dielectric heating – applications of dielectric heating		
32	Advantages of heating – arc furnace		
33	Direct arc furnace – indirect arc furnace		
34	Welding: introduction		
35	Resistance welding		
36	Spot welding		
37	Projection welding		
38	Seam welding		
39	Butt welding		
40	Arc welding		
41	Metal arc welding		
42	Helium arc welding		
43	Carbon arc welding		
44	Hydrogen arc welding		
UNIT-IV TRACTION CO4 : Discuss about the mechanisms, equipment and technology used in the electric traction. TB: Electrical Power Systems(Generation, Transmission, Distribution, Protection and Utilization of Electrical Energy) – Dr. S.L.Uppal and Prof. Sunil S.Rao – Khanna Publisher, 15th edition, 1987.			
45	Introduction	From: 13-09-2022	Lecture interspersed with discussions
46	Advantages and disadvantages- systems of traction		
47	Classification of traction		
48	Classification of traction		



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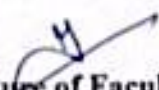
49	Speed-time curve for different service	To: 10-10-2022	
50	Speed-time curve for different service		
51	Various factors affecting the energy consumption		
52	Components of electric locomotive		
53	Description of each component		

UNIT-V GROUNDING

CO5 : Identify the importance of electrical earthing, earthing equipment and electrical earthing measurement methods.

TB: Electrical Power Systems(Generation, Transmission, Distribution, Protection and Utilization of Electrical Energy) – Dr. S.L.Uppal and Prof. Sunil S.Rao – Khanna Publisher, 15th edition, 1987.

54	Introduction	From: 12-10-2022 To: 29-10-2022	Lecture interspersed with discussions
55	Earth and safety		
56	Nature of an electrode system		
57	Earth conductor sizes		
58	Design of earthing electrodes		
59	Earthing system		
60	Earthing system		
61	Substation earthing mats		
62	Substation earthing mats		
63	Earthing practices		
64	Earth testing		
65	Methodology		
66	Earth tester and use		


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