

TENTATIVE LESSON PLAN: R1921031

Course Title: VECTOR CALCULUS & FOURIER TRANSFORMS			
Section : IIMECH	Date : 2/11/2020	Page No : 01 of 03	
Revision No : 00	Prepared By: K.BASAVARAJU	Approved By : HOD	
Tools: Black board			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT – I: VECTOR CALCULUS 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 TB: “ Engineering Mathematics”, Dr. T.K.V.Iyengar; S.Chand publications			
1	Vector Differentiation: Introduction	From: 2/11/2020 To 21/12/2020	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	Vector Integration: Introduction		
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		
UNIT – II: LAPLACE TRANSFORMS CO2: To apply the Laplace transform for solving differential equations TB: “ Engineering Mathematics”, Dr. T.K.V.Iyengar; S.Chand publications			
22	Laplace Transforms: Definitions, Existence	From 23/11/2020 To 19/12/2020	Lecture interspersed with discussions
23	Laplace Transform of standard functions		
24	Linearity property; Shifting properties Change of scale property		
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	Inverse Laplace Transforms: 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 forward 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 21/12/2020 To 9/01/2021	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 11/01/2021 To 6/02/2021	Lecture interspersed with discussions
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 $f(p, q) = 0$		
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	$f(pz^m, qz^m) = 0$		

UNIT – V: SECOND ORDER PARTIAL DIFFERENTIAL EQUATIONS AND APPLICATIONS

CO5:		To	
identifysolutionmethodsforpartialdifferentialequationsthatmodelphysicalprocesses			
TB: " Engineering Mathematics", Dr. T.K.V.Iyengar; S.Chand publications			
61	Introduction; Homogeneous Linear P.D.E with constant coefficients; finding CF Finding PI: RHS term of the type $e^{(ax+by)}$	From 8/02/2021 To 27//2021	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		

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TENTATIVE LESSON PLAN: R1921032 MECHANICS OF SOLIDS

Course Title: MECHANICS OF SOLIDS (R1921032)		
Section : A	Date : 02-11-2020	Page No : 01 of 03
Revision No : 00	Prepared By : R. KIRAN KUMAR	Approved By : HOD

Tools : Black board, PPTs

S.No	TOPIC	Date	Mode of Delivery
UNIT –I SIMPLE STRESS AND STRAINS			
CO1: Student will model & analyze the behavior of basic structural members subjected to various loading and support conditions based on principles of equilibrium.			
TB : "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.			
	SIMPLE STRESSES & STRAINS :		Lecture interspersed with discussions
1	Introduction, Elasticity and plasticity, Types of stresses and strains	02/11/2020	
2	Hooke's law – stress – strain diagram for mild steel, Problems	03/11/2020	
3	Working stress – Factor of safety, problems	04/11/2020	
4	problems	05/11/2020	
5	Lateral strain, Poisson's ratio & volumetric strain	05/11/2020	
6	problems	09/11/2020	
7	Bars of varying section problems, composite bars problems, Temperature stresses & Complex Stresses	10/11/2020	
8	problems	11/11/2020	
9	Stresses on an inclined plane problems	12/11/2020	
10	Principal planes and principal stresses	12/11/2020	
11	Mohr's circle & Relation between elastic constants	16/11/2020	
12	problems	17/11/2020	
13	problems	18/11/2020	
14	problems	19/11/2020	
15	Resilience , problems	19/11/2020	
16	Gradual loading & sudden loading problems	23/11/2020	
17	problems	24/11/2020	
18	Impact loading & Shock loading problems	25/11/2020	
UNIT –II SHEAR FORCE AND BENDING MOMENT			
CO2: Able to understand the apply the concept of stress and strain to analyze and design structural members and machine parts under axial, shear and bending loads, moment and torsional moment.			
TB : "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.			
19	SHEAR FORCE AND BENDING MOMENT		Lecture interspersed with discussions
20	Definition of beam, Types of beams & Types of loads	26/11/2020	

21	Introduction to S.F & B.M	26/11/2020	
22	S.F and B.M diagrams for cantilever beam problems	30/11/2020	
23	problems	1/12/2020	
24	problems	2/12/2020	
25	problems	3/12/2020	
26	S.F and B.M diagrams for simply supported beam	3/12/2020	
27	problems	7/12/2020	
28	problems	8/12/2020	
29	problems	9/12/2020	
30	Problems	10/12/2020	
31	S.F and B.M diagrams for overhanging beams	10/12/2020	
32	problems	14/12/2020	
33	problems	15/12/2020	
34	Point of contra flexure	16/12/2020	
35	Relation between S.F., B.M	17/12/2020	
36	Rate of loading at a section of a beam	17/12/2020	
37	problems	21/12/2020	

UNIT - III FLEXURAL STRESSES AND SHEAR STRESSES

CO3: Students will learn all the methods to analyze beams, columns, frames for normal, shear, and torsion stresses and to solve deflection problems in preparation for the design of such structural components. Students are able to analyse beams and draw correct and complete shear and bending moment diagrams for beams.

TB : "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

38	FLEXURAL STRESSES		Lecture interspersed with discussions
39	Theory of simple bending, Assumptions	22/12/2020	
40	Derivation of bending equation: $M/I = f/y = E/R$	23/12/2020	
41	problems	24/12/2020	
42	Neutral axis, Determination bending stresses	24/12/2020	
43	problems	28/12/2020	
44	problems	29/12/2020	
45	problems	30/12/2020	
46	Section modulus of rectangular and circular sections (Solid and Hollow)	31/12/2020	
47	problems	31/12/2020	
48	problems	4/01/2020	
49	Section modulus of I,T sections	5/01/2020	
50	problems	6/01/2020	
51	Section modulus of Angle and Channel sections	7/01/2020	
52	problems	7/01/2020	
53	Design of simple beam sections.	18/01/2020	
54	problems	19/01/2020	

55	Derivation of formula Shear stress	20/01/2020	
56	Shear stress distribution in rectangle, circle & triangle sections	21/01/2020	
57	Shear stress distribution in circular, triangular, I, T angle sections	21/01/2020	

UNIT – IV DEFLECTION OF BEAMS & TORSION

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

TB : "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

58	DEFLECTION OF BEAMS		Lecture interspersed with discussions
59	Bending into a circular arc & slope	1/02/2020	
60	Deflection & radius of curvature	2/02/2020	
61	Double integration and Macaulay's methods	3/02/2020	
62	Determination of slope and deflection for cantilever and simply supported beams subjected to point loads	4/02/2020	
63	U.D.L, U.V.L, Mohr's theorems, Applications	4/02/2020	
64	Statically indeterminate Beams and solution methods	8/02/2020	
65	TORSION		
66	Introduction, Derivation- Torsion of Circular shafts	9/02/2020	
67	Pure Shear, Transmission of power by circular shafts, Shafts in series & parallel	10/02/2020	

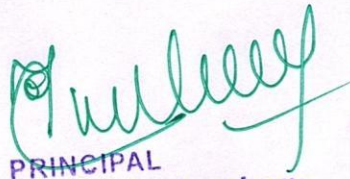
UNIT - V THIN CYLINDERS AND THICK CYLINDERS, COLUMNS

CO5: Student can design and analysis of Industrial components like pressure vessels.

TB : "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

68	CYLINDERS & COLUMNS		Lecture interspersed with discussions
69	Introduction, Thin seamless cylindrical shells	11/02/2020	
70	Derivation of formula for longitudinal and circumferential stresses, Columns with other support Conditions	11/02/2020	
71	hoop, longitudinal and Volumetric strains	15/02/2020	
72	changes in dia, and volume of thin cylinders	16/02/2020	
73	Riveted boiler shells, Thin spherical shells, wire wounded thin cylinder, Wire wound thin cylinder	17/02/2020	
74	lame's equation, Buckling and Stability, Columns with Pinned ends	18/02/2020	
75	cylinders subjected to inside & outside pressures, compound cylinders	18/02/2020	

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TENTATIVE LESSON PLAN: R1921033 METALLURGY & MATERIALS SCIENCE

Course Title: METALLURGY & MATERIALS SCIENCE		
Section : Sec A	Date : 02/11/2020	Page No : 01 of 04
Revision No : 00	Prepared By : P. Tarun Naga Venkatesh	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Structure of Metals and Constitution of alloys			
CO1: To know the basic concepts of bonds in metals and alloys. To understand the regions of stability of the phases that can occur in an alloy system in order to solve the problems in practical metallurgy.			
TB: Introduction to Physical Metallurgy – Sidney H. Avener			
1	Bonds in Solids	02/11/2020	Lecture interspersed with discussions
2	Metallic Bond	03/11/2020	
3	Crystallization of Metals	05/11/2020	
4	Packing Factor - SC, BCC, FCC & HCP-line density, plane density	07/11/2020	
5	Grain and Grain Boundaries	09/11/2020	
6	Effect of Grain Boundaries on the Properties of Metal / Alloys	10/11/2020	
7	Determination of Grain Size	12/11/2020	
8	Necessity of Alloying	16/11/2020	
9	Types of Solid Solutions	17/11/2020	
10	Hume Rotherys Rules	19/11/2020	
11	Intermediate Alloy Phases, And Electron Compounds	21/11/2020	
Equilibrium Diagrams			
12	Experimental Methods of Construction of Equilibrium Diagrams	23/11/2020	
13	Isomorphous Alloy Systems	24/11/2020	
14	Equilibrium Cooling and Heating of Alloys	26/11/2020	
15	Lever Rule, Coring Miscibility Gaps	28/11/2020	
16	Eutectic Systems	01/12/2020	

17	Congruent Melting Intermediate Phases	03/12/2020	Lecture interspersed with discussions
18	Peritectic Reaction	05/12/2020	
19	Transformations in the Solid State	07/12/2020	
20	Allotropy, Eutectoid, Peritectoid Reactions	08/12/2020	
21	Phase Rule	10/12/2020	
22	Relationship Between Equilibrium Diagrams and Properties of Alloys	14/12/2020	
23	Study of Important Binary Phase Diagrams of Cu-Ni	15/12/2020	
24	Study of Important Binary Phase Diagrams of Al-Cu, Bi-Cd, Cu-An	17/12/2020	
25	Study of Important Binary Phase Diagrams of Cu-Sn and Fe-Fe ₃ C	19/12/2020	
UNIT-II Ferrous Metals and Alloys			
CO2: To study the basic differences between cast irons and steels, their properties and practical applications. To study the properties and applications of widely used non-ferrous metals and alloys so as to use the suitable material for practical applications.			
TB: Introduction to Physical Metallurgy – Sidney H. Avener			
26	Structure and Properties of White Cast Iron	21/12/2020	Lecture interspersed with discussions
27	Malleable Cast Iron	22/12/2020	
28	Grey Cast Iron, Spheroidal Graphite Cast Iron	24/12/2020	
29	Alloy Cast Irons. Classification of Steels	28/12/2020	
30	Structure And Properties of Plain Carbon Steels	29/12/2020	
31	Low Alloy Steels, Hadfield Manganese Steels	31/12/2020	
32	Tool and Die Steels	02/01/2021	
Non-ferrous Metals and Alloys			
33	Structure and Properties of Copper and its Alloys	04/01/2021	
34	Aluminium and its Alloys	05/01/2021	
35	Titanium and its Alloys	07/01/2021	

UNIT-III Heat treatment of Alloys

CO3: To study the affect of various alloying elements on iron-iron carbide system. To understand the various heat treatment and strengthening processes used in practical applications.

TB: Introduction to Physical Metallurgy – Sidney H. Avener

36	Effect of Alloying Elements on Fe-Fe ₃ C System,	09/01/2021	Lecture interspersed with discussions
37	Annealing, Normalizing, Hardening	11/01/2021	
38	TTT Diagrams	12/01/2021	
39	Tempering , Hardenability	18/01/2021	
40	Surface - Hardening Methods	19/01/2021	
41	Age Hardening Treatment	21/01/2021	
42	Cryogenic Treatment of Alloys	21/01/2021	

UNIT-IV Powder Metallurgy

CO4: To understand the different techniques of powder metallurgy and their practical applications.

TB: Introduction to Physical Metallurgy – Sidney H. Avener

43	Basic processes- Methods of producing metal powders	23/01/2021	Lecture interspersed with discussions
44	Milling atomization, Granulation	25/01/2021	
45	Reduction, Electrolytic Deposition	28/01/2021	
46	Compacting methods – Sintering	28/01/2021	
47	Methods of manufacturing sintered parts.	30/01/2021	
48	Sintering Secondary operations-Sizing	01/02/2021	
49	coining, machining	02/02/2021	
50	Factors determining the use of powder metallurgy	04/02/2021	
51	Application of this process	04/02/2021	

UNIT-V Ceramic and composite materials

CO5: To study the properties and applications of ceramic, composite and other advanced materials so as to use the suitable material for practical applications.

TB: Introduction to Physical Metallurgy – Sidney H. Avener			
52	Crystalline Ceramics, Glasses	06/02/2021	Lecture interspersed with discussions
53	Cermaets, Abrasive Materials	08/02/2021	
54	Nanomaterials – Definition	09/02/2021	
55	Properties and Applications of the Above	11/02/2021	
56	Classification of Composites	11/02/2021	
57	Various Methods of Component Manufacture of Composites	13/02/2021	
58	Particle – Reinforced Materials	15/02/2021	
59	Fiber Reinforced Materials	16/02/2021	
60	Metal Ceramic Mixtures	18/02/2021	
61	Metal – Matrix Composites	18/02/2021	
62	C – C Composites	20/02/2021	

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TENTATIVE LESSON PLAN: R1921034

PRODUCTION TECHNOLOGY

Course Title: PRODUCTION TECHNOLOGY			
Section: A		Date: 2/11/2020	
Revision No: 00	Prepared By: Mr. M Hari Krishna	Approved By: HOD	
Tools: Black board, PPTs, online lectures			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Casting			
CO1: Able to design the patterns and core boxes for metal casting processes.			
TB:			
<ol style="list-style-type: none"> 1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn. 2. Manufacturing Technology -Vol I- P.N. Rao- TMH 			
1	Steps involved in making a casting, Advantage of casting and its applications.	03/11/2020	Lecture interspersed with discussions
2	Patterns and Pattern making	04/11/2020	
3	Pattern making, – Types of patterns	05/11/2020	
4	Materials used for patterns	06/11/2020	
5	pattern allowances and their construction,	10/11/2020	
6	Molding – molding methods	12/11/2020	
7	ingredients of molding sand	13/11/2020	
8	Molding materials, Properties of molding sand	17/11/2020	
9	Testing of molding sand.	18/11/2020	
10	Types of molding – Hand molding – Machine molding.	19/11/2020	
11	Core, different types of cores and materials	20/11/2020	
12	properties of core sand – core manufacturing.	24/11/2020	
UNIT-II Casting Techniques and Melting.			
CO2: Able to design the gating system for different metallic components.			
TB:			
<ol style="list-style-type: none"> 1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn. 2. Manufacturing Technology -Vol I- P.N. Rao- TMH 			
13	Principles of Gating, Gating ratio	25/11/2020	
14	Design of Gating systems.	26/11/2020	
15	Risers – Types, function, and design,	27/11/2020	

16	Casting design considerations.	01/12/2020	Lecture interspersed with discussions
17	Methods of melting	03/12/2020	
18	Types of furnaces - cupola, electric arc, resistance and induction furnace	05/12/2020	
19	Solidification of castings-Solidification of pure metals and alloys-Short & long freezing range alloys.	07/12/2020	
20	Fettling. Casting defects.	08/12/2020	
21	Basic principles and applications of special casting Processes	10/12/2020	
22	Centrifugal casting	14/12/2020	
23	True, semi and centrifuging,	15/12/2020	
24	Die casting, Investment casting	17/12/2020	
25	Shell molding.	21/12/2020	
UNIT-III Welding			
CO3: Learn about the different types of welding processes used for special fabrication.			
TB:			
1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.			
2. Manufacturing Technology -Vol I- P.N. Rao- TMH			
26	Classification of welding processes, types of welded joints and their characteristics.	22/12/2020	Lecture interspersed with discussions
27	Gas welding, Different types of flames and uses, Oxy – Acetylene Gas cutting.	24/12/2020	
28	Basic principles of Arc welding, power characteristics, Manual metal arc welding,	28/12/2020	
29	Submerged arc welding, TIG & MIG welding.	29/12/2020	
30	Electro – slag welding. Resistance welding, Friction welding,	31/12/2020	
31	Friction stirs welding, Forge welding, Explosive welding; Thermit welding	02/01/2021	
32	Plasma Arc welding, Laser welding, electron beam welding,	04/01/2021	
33	Soldering & Brazing. Heat affected zones in welding; pre & post heating,	05/01/2021	
34	destructive and non-destructive testing of welds.	07/01/2021	
35	Weldability of metals, welding defects and causes and remedies	09/01/2021	

UNIT-IV Other Manufacturing Processes**CO4:** Know the different types of manufacturing processes.**TB:**

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH.

36	Plastic deformation in metals and alloys-recovery	11/01/2021	Lecture interspersed with discussions
37	Recrystallization and grain growth.	12/01/2021	
38	Hot working and Cold Working-Strain hardening and Annealing.	18/01/2021	
39	Bulk forming processes: Forging - Types of Forging, Smith forging, Drop Forging, Roll forging,	19/01/2021	
40	Forging hammers, Rotary forging, forging defects.	21/01/2021	
41	Rolling – fundamentals, types of rolling mills and products.	23/01/2021	
42	Forces in rolling and power requirements.	25/01/2021	
43	Extrusion and its characteristics. Types of extrusion	28/01/2021	
44	Impact extrusion, Hydrostatic extrusion;	30/01/2021	
45	Wire drawing and Tube drawing.	01/02/2021	

UNIT-V Sheet Metal Forming**CO5:** To impart knowledge on sheet metal forming and their relevance in current manufacturing.**TB:**

1. Manufacturing Processes for Engineering Materials - Kalpakjain S and Steven R Schmid- Pearson Publ , 5th Edn.
2. Manufacturing Technology -Vol I- P.N. Rao- TMH

46	Drawing, stretch forming,	02/02/2021	
47	Bending, Spring back and its remedies,	04/02/2021	
48	Coining, Spinning	06/02/2021	
49	Types of presses and press tools.	08/02/2021	
50	High energy rate forming processes:	09/02/2021	

51	Principles of explosive forming,	11/02/2021	Lecture interspersed with discussions
52	electromagnetic forming,	13/02/2021	
53	Electrohydraulic forming,	15/02/2021	
54	rubber pad forming, advantages and limitations.,	16/02/2021	
55	Revision	18/02/2021	
56	Revision	20/02/2021	

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TENTATIVE LESSON PLAN: R1931035

Course Title: THERMODYNAMICS		Course code: R1931035	
Section : Sec A	Date :02/11/2020	Page No : 01 to 03	
Revision No : 00	Prepared By: D.SREERAMPRASAD	Approved By : HOD	
Tools: BLACK BOARD,PPT			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I BASIC CONCEPTS OF THERMODYNAMICS			
CO1: The student will be able to study the concept of various thermodynamic cycles and working of systems			
TB: "THERMODYNAMICS, by P.K.NAG 3 rd Edition, Tata McGraw Hill Education Private Limited publications.			
1	What is Thermodynamics	02/11/2020	Lecture interspersed with discussions
2	Macroscopic and Microscopic approach	03/11/2020	
3	Types of systems	05/11/2020	
4	Property and types of properties	06/11/2020	
5	Process quasistatic process	08/11/2020	
6	Reversible and irreversible process	09/11/2020	
7	Pressure and temperature measurement	10/11/2020	
8	Problems on pressure and temperature measurement	11/11/2020	
9	Work and heat	12/11/2020	
10	Work and heat in different process	13/11/2020	
11	Zeroth law of thermodynamics	14/11/2020	
12	Principle of thermometry	17/11/2020	
13	Scale of temperature ,ideal gas scale-PMM1	18/11/2020	
14	Pressure measurement	19/11/2020	
15	Problems on temperature measurement	20/11/2020	
16	Problems on pressure measurement	22/11/2020	
UNIT-II FIRST LAW OF THERMODYNAMICS			
CO2: To study the concepts of first law of thermodynamics.			
TB: "THERMODYNAMICS, by P.K.NAG 3 rd Edition, Tata McGraw Hill Education Private Limited publications			
17	Law of conservation of energy concept of first law of thermodynamics	24/11/2020	Lecture interspersed with discussions
18	First law applied to different thermodynamic process	25/11/2020	
19	Concept of equality of temperature	26/11/2020	
20	Joule's experiment	27/11/2020	
21	Steady flow energy equation applied to boiler,heat exchanger, reciprocating pump	28/11/2020	
22	Steady flow energy equation	02/12/2020	
23	Steady flow energy equation applied to	03/12/2020	

	turbine, gas turbine, compressor		
24	Steady flow energy equation applied to boiler, heat exchanger, reciprocating pump	04/12/2020	
25	Throttling and free expansion	05/12/2020	
26	Vander waal's equation of state	07/12/2020	
27	Variable specific heat and problems	08/12/2020	
28	problems	09/12/2020	
29	Problems	10/12/2020	
UNIT-III : SECOND LAW OF THERMODYNAMICS			
CO3 ; principles to heat engines To understand the second law of thermodynamics and the associated terms and should be able to apply the			
TB1: "THERMODYNAMICS, by P.K.NAG 3 rd Edition, Tata McGraw Hill Education Private Limited publications.			
30	Limitations of first law-Thermal reservoir, heat engine, heat pump	11/12/2020	
31	Second law of thermodynamics-Kelvin-Planck and Clausius statements and their equivalence	14/12/2020	
32	PMM of second kind, Carnot's principle and its specialties	15/12/2020	
33	Thermodynamics scale of temperature, Clausius inequality	16/12/2020	
34	Entropy and principle of entropy	17/12/2020	
35	Availability and irreversibility	18/12/2020	
36	Thermodynamic potential, Gibbs and Helmholtz functions	19/12/2020	
37	Maxwell relations	20/12/2020	
38	Elementary treatment of the third of thermodynamics	21/12/2020	
39	problems	22/12/2020	
40	problems	28/12/2020	
UNIT-4 PROPERTIES OF STEAM			
Co4. To study and understand the process steam formation and its representation on property diagram			
B: "THERMODYNAMICS, by P.K.NAG 3 rd Edition, Tata McGraw Hill Education Private Limited publications			
41	Pure substances, P-V-T surfaces	28/12/2020	
42	T-S, h-s diagrams, Mollier chart	29/12/2020	
43	Phase transformation-triple point at critical	02/1/2021	
			Lecture interspersed with discussions

	state properties		
44	Dryness fraction		
45	Clausius-clapeyron equation property tables-mollier chart-various Thermodynamics process	04/1/2021	
46	Steam calorimetry	05/1/2021	
UNIT-V GAS MIXTURES AND PSYCHROMETRY			
CO5: To understand and able to use psychometric chart and calculate psychometric properties of air			
TB: THERMODYNAMICS, by P.K.NAG 3 rd Edition, Tata McGraw Hill Education Private Limited publications			
47	Mixture of perfect gases -mole fraction, mass fraction, gravimetric and volumetric analysis	06/1/2021	Lecture interspersed with discussions
48	Dalton's law of partial pressures-Avogadro's law of additive volumes-mole fraction, volume fraction and partial pressure	07/1/2021	
49	Internal energy, enthalpy, sp. Heats and entropy of perfect gases and vapor	08/1/2021	
50	Psychrometry properties -driven temperature, wet bulb temperature, dew point temperature	19/1/2021	
51	Specific humidity, relative humidity, saturated air and vapor pressure	20/1/2021	
52	Degree of saturation-adiabatic saturation	22/1/2021	
53	Carrier's equation- psychrometry charts	04/02/2021	
54			
UNIT-VI POWER CYCLES			
CO6: To understand the concepts of air standard cycles and should be able to calculate the efficiency and the performance parameters of system that use this cycles			
TB: "THERMODYNAMICS, by P.K.NAG 3 rd Edition, Tata McGraw Hill Education Private Limited publications			
55	Otto and Diesel cycles	05/02/2021	Lecture interspersed with discussions
56	Dual combustion cycle, Sterling cycle	08/02/2021	
57	Ericsson cycle and Lenoir cycle	10/02/2021	
58	Comparison of cycles	11/02/2021	
59	Refrigeration cycles -brayton cycle and rankine cycle and performance evaluation	14/02/2021	
60	Bell-coleman cycle	16/02/2021	
61	Vapour compression cycle, performance evaluation	18/02/2021	
62	Problems	19/02/2021	
63	Problems	20/2/2021	

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Date: 20/2/2021

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20/2/2021

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LESSON PLAN: R1921036
MACHINE DRAWING

Course Title: MACHINE DRAWING		Course code: R1921036	
Section: Sec A	Date:02-11-2020	Page No: 01	
Revision No: 00	Prepared By:G.DURGA PRASAD	Approved By: HOD	
Tools: BLACK BOARD AND PPTS.			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I Drawing of Machine Elements and simpleparts.			
CO1:To provide basic understanding and drawing practice of various joint, simple mechanical parts.			
TB: "Machine Drawing" –K.L.Narayana, P.Kannaiah& K. Venkata Reddy.--			
	UNIT-I- DRAWING OF MACHINE COMPONENTS		
1	Popular forms of Screw threads	04-11-2020	Lecture interspersed with discussions
2	Bolts, nuts	06-11-2020	
3	Stud bolts	11-11-2020	
4	Tap bolts	13-11-2020	
5	Setscrews	18-11-2020	
6	Keys	20-11-2020	
7	Cotter joints	25-11-2020	
8	Knucklejoint.	27-11-2020	
9	Shaft coupling	02-12-2020	
10	Riveted joints forplates	04-12-2020	
11	Spigot and socket pipe joint.	09-12-2020	
12	Journal	11-12-2020	
13	Pivot and collar	16-12-2020	
14	Footstepbearings	18-12-2020	
UNIT-II ASSEMBLY DRAWINGS			
CO2: The student will be able to draw the assembly from the individual part drawing.			
TB: "Machine Drawing" –K.L.Narayana, P.Kannaiah& K. Venkata Reddy.			
	UNIT-II -ASSEMBLY DRAWINGS		
15	Engine parts –Gear pump	23-12-2020	Lecture interspersed with discussions
16	Fuel pump	30-12-2020	
17	Petrol Engine connecting rod	06-01-2021	
18	Pistonassembly	08-01-2021	
19	Other machine parts - Screws jacks	20-01-2021	
20	Machine Vices	22-01-2021	
21	Plummer block	27-01-2021	
22	Tailstock	29-01-2021	
23	Valves: spring loaded safety valve	03-02-2021	
24	Feed check valve	05-02-2021	
25	Air cock	10-02-2021	
26	Controlvalves	12-02-2021	
27	Revision	17-02-2021	


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TENTATIVE LESSON PLAN: R1631031 DYNAMICS OF MACHINERY

Course Title: DYNAMICS OF MACHINERY		
Section : A A B	Date : 17.08.2020	Page No : 01 of 03
Revision No : 00	Prepared By : BALA CHINA LINGAM VANAM	Approved By : HOD

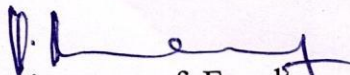
Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I PRECESSION			
CO1: Able to identify stabilization of sea vehicles, aircrafts and automobile vehicles.			
TB : "Theory of machines" / Khurmi / S.Chand.			
1	Introduction	17/08/2020	Lecture interspersed with discussions
2	Gyroscope effect on areoplanes with problems	18/08/2020	
3	Gyroscope effect on naval ships with problems	19/08/2020	
4	Gyroscope effect on 2-wheeler vehicle	20/08/2020	
5	Illustrative problems on 2-wheeler vehicle	21/08/2020	
6	Gyroscope effect on 4-wheeler vehicle with problems	24/08/2020	
7	Gyroscope effect on disc with problems	25/08/2020	
8	Gyroscope effect on bearings with problems	26/08/2020	
9	Static force & Dynamic force analysis on planar mechanism	27/08/2020	
10	Illustrative problems on static force & dynamic force analysis	28/08/2020	
UNIT-II FRICTION, CLUTCHES, BRAKES & DYNAMOMETERS			
CO2: Able to identify frictional losses, torque transmission of mechanical systems.			
TB : "Theory of Machines" / S.S Ratan/ Mc. Graw Hill Publ.			
11	FRICTION: Introduction, Inclined plane	29/08/2020	Lecture interspersed with discussions
12	Friction of screw and nuts with problems	31/08/2020	
13	Pivot and collar, Uniform pressure, Uniform wear	01/09/2020	
14	Friction circle & Friction axis	02/09/2020	
15	Lubricating surfaces & Boundary friction	03/09/2020	
16	Illustrative problems on film lubrication	04/09/2020	

17	CLUTCHES: Introduction-Friction clutches	05/09/2020	
18	Single disc (or) Plate clutch	07/09/2020	
19	Multidisc clutch with problems	08/09/2020	
20	Cone clutch with problems	09/09/2020	
21	Centrifugal clutch with problems	10/09/2020	
22	Brakes and Dynamometers: Introduction	11/09/2020	
23	Simple block brakes	14/09/2020	
24	Illustrative problems on simple block brakes	15/09/2020	
25	Internal expanding brake with problems	16/09/2020	
26	Band brake on vehicles with problems	17/09/2020	
27	General description & operation of dynamometers	18/09/2020	
28	Prony dynamometer	19/09/2020	
29	Rope brake dynamometer with problems	21/09/2020	
30	Epicyclic & Bevis-Gibson dynamometers with problems	22/09/2020	
31	Bevis-Gibson dynamometers with problems		
UNIT-III TURNING MOMENT DIAGRAMS			
CO3: Able to design dynamic force analysis of slider crank mechanism and design of flywheel.			
TB : "Theory of Machines" / S.S Ratan/ Mc. Graw Hill Publ.			
32	Introduction	24/09/2020	Lecture interspersed with discussions
33	Dynamic force analysis of slider crank mechanism	25/09/2020	
34	Inertia torque, angular velocity of connecting rod	26/09/2020	
35	Acceleration of connecting rod, crank effort	28/09/2020	
36	Turning moment diagram of fluctuation of energy	29/09/2020	
37	Coefficient of fluctuation of speed	30/09/2020	
38	Fly wheel and their design with problems	09/10/2020	

39	Fly wheel and their design & Turning moment diagrams with problems	12/10/2020	
40	Illustrative problems on Turning moment diagram	13/10/2020	
UNIT-IV GOVERNORS			
CO4: Able to design of governor its working in different condition.			
T TB : "Theory of Machines" / S.S Ratan/ Mc. Graw Hill Publ.			
41	Introduction & Different types of governors	14/10/2020	Lecture interspersed with discussions
42	Watt governor with problems	15/10/2020	
43	Porter governor with problems	16/10/2020	
44	Proell governor with problems	17/10/2020	
45	Spring loaded governors	19/10/2020	
46	Hartnell governor with auxiliary springs with problems	20/10/2020	
47	Hartung governor with auxiliary springs with problems	21/10/2020	
48	Sensitiveness, Isochronisms & Hunting	22/10/2020	
UNIT-V BALANCING			
CO5: Able to design balancing of reciprocating and rotary masses.			
TB: "Theory of machines" / Khurmi / S.Chand.			
49	Introduction	23/10/2020	Lecture interspersed with discussions
50	Balancing of rotating mass single & multiple planes	24/10/2020	
51	Use of analytical & graphical methods	26/10/2020	
52	Illustrative problems on single planes on rotating masses	27/10/2020	
53	Illustrative problems on different planes on rotating masses	28/10/2020	
54	Primary, secondary & higher balancing of reciprocating mass	29/10/2020	
55	Analytical & Graphical methods with forces & couples diagrams	30/10/2020	
56	Locomotive balancing	31/10/2020	
57	Hammer blow, swaying couple & variation of tractive efforts	2/11/2020	
UNIT-VI VIBRATIONS			
CO6: Able to the identify frequencies of continuous systems starting from the general equation of displacement.			
TB : "Theory of Machines" / S.S Ratan/ Mc. Graw Hill Publ.			
58	Introduction, Types of vibrations, Free	3/11/2020	

	vibration of simple mass system		Lecture interspersed with discussions
59	Oscillation of pendulum, centers of oscillations & suspensions, transverse loads, variation of beams with UDL	4/11/2020	
60	Dunkerley's & Rayleigh's method	4/11/2020	
61	Illustrative problems on Transverse loads with UDL	5/11/2020	
62	Illustrative problems on Dunkerley's method	6/11/2020	
63	Illustrative problems on Rayleigh's method	7/11/2020	
64	Illustrative problems on Forced damped vibration	7/11/2020	
65	Illustrative problems on Forced damped vibration	9/11/2020	
66	Whirling of shafts, critical speeds	10/11/2020	
67	Torsional vibrations-Two and Three rotor systems	11/11/2020	
68	Illustrative problems on Two rotor system	12/11/2020	
69	Illustrative problems on Forced damped vibration & vibration isolation	13/11/2020	
70	Illustrative problems on vibration isolation & Transmissibility	16/11/2020	


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TENTATIVE LESSON PLAN: R1631032

Course Title: METAL CUTTING AND MACHINE TOOLS		Course code: R1631032	
Section : Sec A & B	Date : 17/08/2020	Page No : 01 to 03	
Revision No : 00	Prepared By: D.HARITHA BRAHMA	Approved By : HOD	
Tools: MS teams, Google meet,PPT'S.			
No. of Periods	TOPIC	Date	Mode of Delivery
<p>UNIT-I FUNDAMENTAL OF MACHINING CO1: Students will be able to understand apply cutting mechanics to metal machining based on cutting force and power consumption. TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition</p>			
1	Elementary treatment of metal cutting	17/08/20	Lecture interspersed with discussions
2	Elements of cutting processes	17/08/20	
3	Geometry of single point cutting tool	18/08/20	
4	Tool angles, chip formation, types of chips	19/08/20	
5	Built-up edge and its effects	20/08/20	
6	Chip breakers , mechanics of orthogonal cutting	26/08/20	
7	Merchants force diagram, cutting forces	27/08/20	
8	Cutting speed, feed and depth of cut	28/08/20	
9	Tool life , tool wear, machinability	29/08/20	
10	Problems on merchant circle diagram and tool life equation.	03/09/20 to 04/09/20	
11	Economics of machining, coolants, tool material and properties.	05/09/20 to 09/09/20	
<p>UNIT-II LATHE MACHINES CO2: Students will be able to operate lathe, milling machines, drill press, grinding machines, etc. TB: " MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.</p>			
12	Principle of working, specifications of lathes	10/09/20	Lecture interspersed with discussions
13	Types of lathes, work holders and tool holders	11/09/20 16/09/20	
14	Box tools, taper turning	17/09/20	
15	Thread cutting for lathes	18/09/20	
16	Constructional features of speed and feed gear box	19/09/20	
17	Turret and capstan lathes, collet chucks	23/09/20	
18	Other work and tool holding devices	24/09/20	
19	Principle features of automatic lathes	25/09/20	
20	Classification of automatic lathes, single and multi spindle lathes	26/09/20	

21	Tool layout and cam design for automates	30/09/20	
<p>UNIT-III SHAPING, SLOTTING, PLANNER, DRILLING AND BORING MACHINES CO3: Students will be able to select cutting tool materials and tool geometries for different metals. TB:“ MANUFACTURING PROCESSES” / JP KAUSHISH/ PHI Publishers-2nd Edition.</p>			
22	Working principle and principle parts of shaper	01/10/20	Lecture interspersed with discussions
23	Specifications & principle of operation of shaper	03/10/20	
24	Machining time calculations of shaper	07/10/20	
25	Principle parts, operations performed on slotter	07/10/20	
26	Machining time calculations of slotter & principle of working of planner	08/10/20	
27	Principle parts , operations performed on planner	09/10/20	
28	Working specifications, types of drilling machines	10/10/20	
29	Operations performed and tool holding devices of drilling machines	10/10/20	
30	Twist drills and types	14/10/20	
31	Machining time calculations of planner	14/10/20	
32	Boring machines, fine boring machines	15-10-20	
33	Jig boring machine, deep hole drilling machines	16-10-20	
<p>UNIT-IV MILLING MACHINES CO4: Students will be able to select appropriate machining processes and conditions for different metals. TB: “MANUFACTURING PROCESSES” / JP KAUSHISH/ PHI Publishers-2nd Edition.</p>			
34	Principles of working of milling machines	17/10/20	Lecture interspersed with discussions
35	Specifications, classification of milling machines	28/10/20	
36	Principle features of horizontal and vertical milling machines	29/10/20	
37	Universal milling machines	29/10/20	
38	Machining operations, types of cutter	30/10/20	
39	Geometry of milling cutter	30/10/20	
40	Methods of indexing	31/10/20	
41	Accessories to milling machines	31/10/20	
<p>UNIT-V FINISHING PROCESSES CO5: Students will be able to learn machining economics TB: “MANUFACTURING PROCESSES” / JP KAUSHISH/ PHI Publishers-2nd Edition.</p>			
42	Theory of grinding	02/11/20	Lecture

43	Classification of grinding machines	02/11/20	interspersed with discussions
44	Cylindrical & surface grinding machines	02/11/20	
45	Tools and cutter grinding machines	04/11/20	
46	Different types of abrasives	04/11/20	
47	Bonds and specifications	04/11/20	
48	Selection of grinding wheel	05/11/20	
49	Lapping , honing operations	05/11/20	
50	Broaching operations	05/11/20	
51	Lapping , honing, broaching operation compared to grinding	06/11/20	

UNIT-VI JIGS & FIXTURES AND CNC MACHINE TOOLS

CO6: Students will be able to design jigs and Fixtures for simple parts and principles of CNC Machines

TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

52	Principles of design of jigs and fixtures	07/11/20	Lecture interspersed with discussions
53	Uses of jigs and fixtures	07/11/20	
54	Classification of jigs and fixtures	07/11/20	
55	Principle of location and clamping	11/11/20	
56	Types of clamping	11/11/20	
57	Work holding devices	11/11/20	
58	Typical examples of jigs and fixtures	12/11/20	
59	CNC machine tools	12/11/20	
60	Working principle of CNC	12/11/20	
61	Classification of CNC	12/11/20	
62	Constructional features of CNC	13/11/20	
63	CNC controllers and types of motion controls	13/11/20	
64	Types of motion controls in CNC	13/11/20	
65	Applications of CNC machines	13/11/20	

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**TENTATIVE LESSON PLAN: R1631033
DESIGN OF MACHINE MEMBERS-II**

Course Title: DESIGN OF MACHINE MEMBERS-II		Course code: R1631033	
Section: Sec A & B	Date :17/08/2020	Page No : 01 to 04	
Revision No : 00	Prepared By: R. KARUN KUMAR	Approved By : HOD	
Tools: MS Teams, Google Meet, PPTs			
S.NO.	TOPIC	Date	Mode of Delivery
UNIT-I BEARINGS			
CO1: The student will able to select the suitable bearing based on the application of the loads and predict the life of the bearing.			
TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.			
1	Classification of bearings	17-08-2020	Online class with MS Teams, Google Meet
2	applications. types of journal bearings	18-08-2020	
3	lubrication — bearing modulus	19-08-2020	
4	full and partial — clearance ratio	20-08-2020	
5	clearance ratio , heat dissipation of bearings	21-08-2020	
6	bearing materials	24-08-2020	
7	Journal bearing	25-08-2020	
8	design of ball bearings	26-08-2020	
9	design of roller bearings	27-08-2020	
10	static loading of ball bearings	28-08-2020	
11	static loading of roller bearings	29-08-2020	
12	bearing life	01-09-2020	
13	problems	02-09-2020	
14	Problems on bearings	03-09-2020	
UNIT-II ENGINE PARTS			
CO2: Able to design the IC Engines parts.			
TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.			
15	Connecting Rod	04-09-2020	Online class with MS Teams, Google Meet
16	Thrust in connecting rod	05-09-2020	
17	stress due to whipping action on connecting rod	07-09-2020	
18	Problems on stress due to whipping action on connecting rod	08-09-2020	
19	cranks and crank shafts	09-09-2020	

20	strength and proportions of over hung cranks	10-09-2020	
21	strength and proportions of over center cranks	11-09-2020	
22	crank pins,Crankshafts,Pistons, forces acting on piston	12-09-2020	
23	construction design and proportions of piston,cylinder,Bore and length of cylinder	14-09-2020	
24	Thickness of cylinder wall,Stresses in cylinder wall,Cylinder head,	15-09-2020	
25	Design of studs for cylinder head,problems,problems	16-09-2020	
26	Pistons, piston materials,Thickness of piston head , piston ribs and cup,Piston rings , piston barrel, skirt	17-09-2020	
27	Piston pin , problems	18-09-2020	
UNIT-III Design of curved beams			
CO3: Able to design the curved beams, calculation of stresses in curved beams and expression for radius of neutral axis for curved beams with different cross-sections.			
TB1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.			
TB2: "STRENGTH OF MATERIALS", Dr. R.K. BANSAL, 4thEdition,Laxmi Publications(P) Ltd.			
28	Design of curved beams	19-09-2020	Online class with MS Teams, Google Meet
29	Introduction , stresses in beams	21-09-2020	
30	Expression for radius of neutral axis rectangular section	22-09-2020	
31	Expression for radius of neutral axis circular section	23-09-2020	
32	Expression for radius of neutral axis trapezoidal section	24-09-2020	
33	Expression for radius of neutral axis t-section	25-09-2020	
34	Design of crane hook	26-09-2020	
35	Design of c- clamp	28-09-2020	
36	Problems on radius of neutral axis rectangular section, circular section, trapezoidal section, t-section	05-10-2020	
37	Problems on crane hook	06-10-2020	
38	Problems on c- clamp	07-10-2020	
39	Problems	08-10-2020	

UNIT-IV POWER TRANSMISSIONS SYSTEMS, PULLEYS			
CO4: Able to design power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws.			
TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw Hill Education Private Limited publications.			
40	Transmission of power by belt and drives transmission efficiencies	09-10-2020	Online class with MS Teams, Google Meet
41	belts — flat and v types	10-10-2020	
42	ropes - pulleys for belt and rope drives	12-10-2020	
43	materials, chain drives	13-10-2020	
44	chain drives	14-10-2020	
45	problems	15-10-2020	
46	DESIGN OF POWER SCREWS : Design of screw	16-10-2020	
47	square ACME, buttress screws, problems	17-10-2020	
48	design of nut, compound screw	26-10-2020	
49	Differential screw, ball screw	27-10-2020	
50	possible failures,	28-10-2020	
51	Problems	29-10-2020	
UNIT-V SPUR & HELICAL GEAR DRIVES			
CO5: Able to design the spur & helical gear for different engineering applications.			
TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw Hill Education Private Limited publications.			
52	Spur gears- helical gears, load concentration factor, flange couplings	02-11-2020	Online class with MS Teams, Google Meet
53	Dynamic load factor, surface compressive strength — bending strength,	03-11-2020	
54	design analysis of spur gears — estimation of centre distance,	05-11-2020	
55	Module and face width, check for plastic creek for dynamic wear considerations, Problems	06-11-2020	
56	Problems	07-11-2020	
57	Problems	09-11-2020	
UNIT-VI MACHINE TOOL ELEMENTS			
CO6: Able to design the Levers , brackets and Wire Ropes.			
TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw Hill Education Private Limited publications.			
58	Levers and brackets: design of levers	10-11-2020	

59	hand lever, cranked lever, problems	11-11-2020	Online class with MS Teams, Google Meet
60	loaded safety valve, rocker arm straight	12-11-2020	
61	Angular design of a crank pin, Wire Ropes	13-11-2020	
62	Stresses in wire ropes, sheaves and & drums	14-11-2020	

TB1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw Hill Education Private Limited publications.

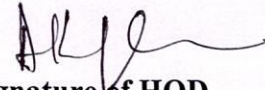
TB2: "STRENGTH OF MATERIALS", Dr. R.K. BANSAL, 4th Edition, Laxmi Publications(P) Ltd.



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TENTATIVE LESSON PLAN

R1631034 OPERATIONS RESEARCH

Course Title: OPERATIONS RESEARCH		
Section : A & B	Date : 02/11/2020	Page No : 01 of 03
Revision No : 00	Prepared By : T.Prasanna	Approved By : HOD

Tools : Black board

No. of Periods	TOPIC	Date	Mode of Delivery
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UNIT- I : DEVELOPMENT OF OR & ALLOCATION

CO1: To understand the need of using OR – a quantitative approach for effective decision making, know various definitions of OR, its characteristics and various phases of scientific study. To gain knowledge of situations in which LPP can be applied and understand fundamental concepts and able to solve LPP by using different methods.

TB1 : OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

1.	Development of OR – definition	From: 02-11-2020 To: 17-11-2020	Lecture interspersed with discussions
2.	characteristics and phases of OR		
3.	OR models and applications.		
4.	Linear programming problem formulation		
5.	Sol.of LPP by graphical solution		
6.	Sol.of LPP by simplex method		
7.	Sol.of LPP by Big-M method		
8.	Sol.of LPP by two-phase method		
9.	Duality principle		
10.	Problems-Revision		

UNIT- II : TRANSPORTATION PROBLEM & SEQUENCING

CO2: To recognize and formulate a transportation problem involving a large no. of shipping routes and Assignment problems. To derive initial basic feasible solution & optimal solution using several methods and able to solve travelling salesman problem.

TB1 : OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

11.	Introduction and Formulation of TP	From: 18-11-2020 To: 11-12-2020	Lecture interspersed with discussions
12.	Sol.of TP by NWC rule		
13.	Sol.of TP by LCC method		
14.	Sol.of TP by VAM		
15.	Sol.of TP by UV method		
16.	Unbalanced transportation problem – degeneracy		
17.	Assignment problem – formulation		
18.	Optimal solution by Hungarian method		
19.	Traveling salesman problem		
20.	Introduction to flow –shop sequencing		

21.	n jobs through two machines, problems	04/12/2020	
22.	n jobs through three machines, problems	05/12/2020	
23.	Two jobs through 'm' machines, problems	07/12/2020	
24.	Revision	09/12/2020	

UNIT III- REPLACEMENT THEORY

CO3 : Be able to realize the need to study replacement policies & make distinctions among various types of failure.

TB1 : OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

25.	Introduction – replacement of items that deteriorate with time when money value is not counted	11/12/2020 15/12/2020	Lecture interspersed with discussions
26.	Problems	16/12/2020	
27.	Replacement of items that deteriorate with time when money value is counted	18/12/2020	
28.	Problems	19/12/2020	
29.	replacement of items that fail completely, group replacement.	22/12/2020 23/12/2020	
30.	Problems	24/12/2020	

UNIT – IV THEORY OF GAMES & WAITING LINES

CO4 : To understand how optimal strategies are formulated in conflict and competitive environment & apply various methods to select and execute various optimal strategies to win the game.

To understand distinction among several queuing models and derive performance measures for each of them.

TB1 : OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

TB2 : OPERATIONS RESEARCH Theory & Applications by J K Sharma.

31.	Introduction to game theory, Definitions, Kendall's Notation	28/12/2020	Lecture interspersed with discussions
32.	mini. max (max. mini) – criterion	29/12/2020	
33.	Rectangular games without saddle points – 2 x 2 games	30/12/2020	
34.	Dominance principle	04/01/2021	
35.	m x 2 games -graphical method.	05/01/2021	
36.	2 x n games -graphical method.	06/01/2021	
37.	Problems	07/01/2021	
38.	Introduction to queueing theory	07/01/2021	
39.	M/M/1:∞/FIFO model	08/01/2021	
40.	M/M/1:N/FIFO model	18/01/2021	
41.	M/M/C:∞/FIFO model	19/01/2021	

UNIT –V INVENTORY

CO 5: To understand the meaning of inventory control, to use EOQ to minimize total inventory cost. Be able to use various selective control techniques to classify inventory items into broad categorie

TB1 : OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

TB2 : OPERATIONS RESEARCH Theory & Applications by J K Sharma.

42.	Introduction to Inventory control, Costs involved in Inventory theory	20/01/2021	Lecture interspersed with discussions
43.	EOQ Model without shortage, Problems	22/01/2021	
44.	EOQ Model without shortage, Problems	23/01/2021	
45.	EOQ Model without shortage, Problems	03/02/2021	
46.	EOQ Model with shortages, Problems	04/02/2021	
47.	EOQ Model with shortages, Problems	05/02/2021	
48.	Purchase inventory model with one price break	06/02/2021	
49.	Purchase inventory model with multiple price breaks	08/02/2021	
50.	Instantaneous demand, no set-up cost, Problems	10/02/2021	
51.	Uniform demand, no set-up cost, Problems	11/02/2021	

UNIT - VI : DYNAMIC PROGRAMMING & SIMULATION

CO 6 : To understand various dynamic programming models and their applications in solving a decision-problem. To apply Monte-Carlo simulation technique for solving various types of problems.

TB1 : OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

TB2 : OPERATIONS RESEARCH Theory & Applications by J K Sharma.

54.	Introduction – Bellman’s principle of optimality	12/02/2021	Lecture interspersed with discussions
55.	Applications of dynamic programming		
56.	Capital budgeting problem	13/02/2021	
57.	Shortest path problem	15/02/2021	
58.	Linear programming problem.	16/02/2021	
59.	Problems	19/02/2021	
60.	Definition – types of simulation models	20/02/2021	
61.	Phases of simulation, applications of simulation	23/02/2021	
62.	Advantages and disadvantages of simulation, Simulation languages	24/02/2021 25/02/2021	
63.	Inventory problems	26/02/2021	
64.	Queuing problems	27/02/2021	

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TENTATIVE PLAN: R1631035 THERMAL ENGINEERING-II

Course Title: THERMAL ENGINEERING-II		Course code: R1631035	
Section : Sec A&B	Date : 17-08-2020	Page No : 1 to 3	
Revision No : 00	Prepared By : Y. Durga Bhavani	Approved By : HOD	
Tools: MS Teams, Google meet, PPTs			
S.NO	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO BASIC CONCEPTS CO1: Become familiar with a basic concepts of Rankine cycle. TB: "THERMAL ENGINEERING-II", PAKIRAPPA.			
UNIT-I-BASIC CONCEPTS			
1	Rankine cycle - schematic layout	17-08-2020	Online Class with MS Teams, Google meet
2	thermodynamic analysis, Problems on Rankine cycle	18-08-2020	
3	concept of mean temperature of heat addition	19-08-2020	
4	methods to improve cycle performance	20-08-2020	
5	Regeneration, Problems on regeneration	21-08-2020	
6	Problems on regeneration	24-08-2020	
7	Reheating, Problems on reheating	25-08-2020	
8	Problems on reheating	26-08-2020	
9	combustion: fuels and combustion	27-08-2020	
10	concepts of heat of reaction, adiabatic flame temperature	28-08-2020	
11	Stoichiometry, flue gas analysis	29-08-2020	
UNIT-II BOILERS CO2: Understand working of boilers including water tube, fire tube and high pressure boilers and determine efficiencies. TB: "THERMAL ENGINEERING-II", PAKIRAPPA.			
UNIT-II -BOILERS			
12	Classification	01-09-2020	Online Class with MS Teams, Google meet
13	working principles of L.P & H.P boilers with sketches	02-09-2020	
14	working principles of L.P & H.P boilers with sketches	03-09-2020	
15	mountings- working principles	04-09-2020	
16	accessories- working principles	05-09-2020	
17	boiler horse power, equivalent evaporation, efficiency	07-09-2020	
18	heat balance, draught, classification	08-09-2020	
19	height of chimney for given draught and discharge	09-09-2020	
20	condition for maximum discharge, efficiency of chimney	10-09-2020	
21	Problem	11-09-2020	
22	Problem	12-09-2020	

UNIT-III STEAM NOZZLES & STEAM TURBINES**CO3: Analyze the flow of steam through nozzles****TB: "THERMAL ENGINEERING-II", PAKIRAPPA.**

UNIT-III - STEAM NOZZLES & STEAM TURBINES			Online Class with MS Teams, Google meet
23	STEAM NOZZLES :Function of a nozzle – applications - types	14-09-2020	
24	flow through nozzles, thermodynamic analysis – assumptions	15-09-2020	
25	velocity of fluid at nozzle exit-Ideal and actual expansion in a nozzle	16-09-2020	
26	velocity coefficient, condition for maximum discharge	17-09-2020	
27	critical pressure ratio, criteria to decide nozzle shape	18-09-2020	
28	Super saturated flow, its effects, degree of super saturation	19-09-2020	
29	degree of under cooling - Wilson line	21-09-2020	
30	STEAM TURBINES : Classification – impulse turbine; mechanical details	22-09-2020	
31	velocity diagram – effect of friction – power developed	23-09-2020	
32	axial thrust, blade or diagram efficiency – condition for maximum efficiency	24-09-2020	
33	De-laval turbine - methods to reduce rotor speed-	25-09-2020	
34	velocity compounding, pressure compounding and velocity & pressure compounding	26-09-2020	
35	condition for maximum efficiency	28-09-2020	

UNIT-IV REACTIONTURBINE & STEAM CONDENSERS**CO4: Evaluate the performance of condensers and steam turbines.****TB: "THERMAL ENGINEERING-II", PAKIRAPPA.**

UNIT-IV-REACTIONTURBINE & STEAM CONDENSERS:			Online Class with MS Teams, Google meet
36	REACTIONTURBINE :Mechanical details – principle of operation	05-10-2020	
37	thermodynamic analysis of a stage, degree of reaction	06-10-2020	
38	velocity diagram – Parson’s reaction turbine	07-10-2020	
39	condition for maximum efficiency	08-10-2020	
40	calculation of blade height	09-10-2020	
41	STEAM CONDENSERS : Requirements of steam condensing plant	10-10-2020	
42	classification of condensers – working principle of different types	12-10-2020	
43	vacuum efficiency and condenser efficiency – air leakage, sources and its affects	13-10-2020	
44	air pump- cooling water requirement	14-10-2020	
45	problems	15-10-2020	

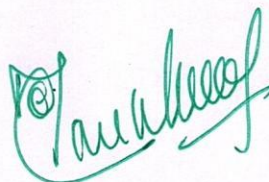
UNIT-V GAS TURBINES**CO5: Evaluate the performance of gas turbines.****TB: "THERMAL ENGINEERING-II", PAKIRAPPA.**

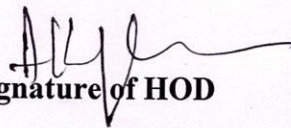
UNIT-V- GAS TURBINES			Online
46	Simple gas turbine plant – ideal cycle	16-10-2020	
47	essential components	17-10-2020	
48	parameters of performance – actual cycle	26-10-2020	
49	regeneration, inter cooling	27-10-2020	

50	reheating –closed and semi-closed cycles	28-10-2020	Class with MS Teams, Google meet
51	merits and demerits	29-10-2020	
52	types of combustion chambers	02-11-2020	
53	problems	03-11-2020	
UNIT-VI JET PROPULSIONS & ROCKETS			
CO6: Understand working of jet propulsions and rockets and related problems.			
TB: "THERMAL ENGINEERING-II", PAKIRAPPA.			
	UNIT-VI- JET PROPULSIONS & ROCKETS		Online Class with MS Teams, Google meet
54	JET PROPULSIONS -Principle of operation.	05-11-2020	
55	classification of jet propulsive engines	06-11-2020	
56	working principles with schematic diagrams and representation on t-s diagram	07-11-2020	
57	thrust, thrust power and propulsion efficiency	09-11-2020	
58	problems	10-11-2020	
59	turbo jet engines – needs and demands met by turbo jet	11-11-2020	
60	performance evaluation, thrust augmentation – methods	12-11-2020	
61	Rockets : Application	13-11-2020	

TB: "THERMAL ENGINEERING-II", PAKIRAPPA.


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TENTATIVE LESSON PLAN

Course Title: MECHATRONICS		Course Code: R1641031
Section : Sec A <i>KB</i>	Date : 11/6/2019	Page No : 01 of 03
Revision No : 00	Prepared By: A.STANLY KUMAR	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO MECHATRONICS SYSTEMS			
CO1: Able to UNNDERSTAND BASICS OF MECHATRONICS.			
T TB: Mechatronics Integrated Mechacal Electronics Systems,K.P.Ramachandran			
G.K.Vijayaraghavan,M.S.Balasundaram/Wiley India			
1	INTRODUCTION Mechatronics	02/11/2020	Lecture interspersed with discussions
2	Mechatronics.	02/11/2020	
3	Elements & levels of mechatronics system,	03/11/2020	
4	Mechatronics design process, system	04/11/2020	
5	Measurement systems, control systems	05/11/2020	
6	Microprocessor-based controllers	05/11/2020	
7	Systems advantages, and disadvantages of mechatronics systems	06/11/2020	
8	Sensors and transducers, types,	07/11/2020	
9	Displacement, position, proximity, velocity	09/11/2020	
10	Motion, force, acceleration, torque, fluid pressure,	11/11/2020	
11	Liquid flow, liquid level, temperature, and light sensors.	12/11/2020	
12	Revision	13/11/2020	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-II SOLID STATE ELECTERONIC DEVICES			
CO2: Able to SOLID STATE ELECTERONIC DEVICES			
TB: Mechatronics Integrated Mechacal Electronics Systems,K.P.Ramachandran			
G.K.Vijayaraghavan,M.S.Balasundaram/Wiley India			

1	UNIT-II Solid state electronic devices ..., noise reduction, filtering.	24/11/2020	Lecture interspersed with discussions
2	PN junction diode	25/11/2020	
3	BJT	26/11/2020	
4	FET	28/11/2020	
5	DIAC	01/12/2020	
6	TRIAC and LEDs	02/12/2020	
7	Analog signal conditioning	03/12/2020	
8	Operational amplifiers	04/12/2020	
9	Operational amplifiers,	05/12/2020	
10	Noise reduction,	07/12/2020	
11	Solid state electronic devices ..., noise reduction, filtering.	09/12/2020	
12	PN junction diode	11/12/2020	
13	BJT	15/12/2020	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-III HYDRAULIC AND PNEUMATIC ACTUATING SYSTEMS			
CO3: Able to HYDRAULIC AND PNEUMATIC ACTUATING SYSTEMS			
T TB: Mechatronics Integrated Mechacal Electronics Systems,K.P.Ramachandran			
G.K.Vijayaraghavan,M.S.Balasundaram/Wiley India			
1	UNIT-III Hydraulic and pneumatic actuating systems – Fluid systems,	16/12/2020	Lecture interspersed with discussions
2	Hydraulic systems,	18/12/2020	
3	Pneumatic systems	19/12/2020	
4	Components	22/12/2020	
5	Electro-pneumatic	23/12/2020	
6	Hydro-pneumatic,	24/12/2020	
7	Electro-hydraulic servo systems.	28/12/2020	

8	Mechanical actuating systems and electrical actuating systems	29/12/2020	
9	Basic principles and elements.	30/12/2020	
10	Hydraulic and pneumatic actuating systems – Fluid systems,	04/01/2021	
11	Hydraulic systems,	05/01/2021	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-IV Digital electronics and systems. CO4: Able to Digital electronics and systems. T TB: Mechatronics Integrated Mechacal Electronics Systems,K.P.Ramachandran G.K.Vijayaraghavan,M.S.Balasundaram/Wiley India			
1	UNIT-IV Digital electronics and systems.	06/01/2021	Lecture interspersed with discussions
2	Digital logic control	07/01/2021	
3	Micro controllers	07/01/2021	
4	Microprocessors and, programming	08/01/2021	
5	Process controllers	18/01/2021	
6	Programmable logic controllers,	19/01/2021	
7	PLCs versus computers	20/01/2021	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-V System and interfacing and data acquisition CO5: Able to UNNDERSTAND System and interfacing and data acquisition T TB: Mechatronics Integrated Mechacal Electronics Systems,K.P.Ramachandran G.K.Vijayaraghavan,M.S.Balasundaram/Wiley India			
1	System and interfacing and data acquisition.	03/02/2021	Lecture interspersed
2	Data Acquisition Systems	04/02/2021	
3	Analog to Digital and Digital to Analog	05/02/2021	

	conversions.		with discussions
4	Digital Signal Processing	06/02/2021	
5	Data flow in DSPs, block diagrams	08/02/2021	
6	Typical layouts	10/02/2021	
7	Interfacing motor drives	11/02/2021	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-VI Dynamic models and analogies. CO6: Able to Dynamic models and analogies. T TB: Mechatronics Integrated Mechacal Electronics Systems,K.P.Ramachandran G.K.Vijayaraghavan,M.S.Balasundaram/Wiley India			
1	Dynamic models and analogies.	15/02/2021	Lecture interspersed with discussions
2	System response	16/02/2021	
3	Process Controllers	19/02/2021	
4	Digital Controllers	20/02/2021	
5	Programmable Logic Controllers,	23/02/2021	
6	Design of mechatronics systems	24/02/2021	
7	Future trends.	25/02/2021	
8	Revision	26/02/2021	

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TENTATIVE LESSON PLAN

Course Title: CAD / CAM		Course Code: R1641032
Section : Sec A	Date : 17/08/2020	Page No : 01 of 03
Revision No : 00	Prepared By : D ROGNATHA RAO	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION CAD CAM			
CO1: Able to UNNDERSTAND CAD CAM BASIC			
T TB: IBRAHIM ZAHEED CAD CAM THEORY			
1	CAD CAM BASIC	17/8/2020	Online Class with MS Teams
2	Computers in industrial manufacturing, product cycle	18/8/2020	
3	CAD / CAM Hardware	19/8/2020	
4	basic structure, CPU	21/8/2020	
5	memory types, input devices	24/8/2020	
12	display devices, hard copy devices	26/8/2020	
11	Raster scan graphics coordinate system	28/8/2020	
12	database structure for graphics modeling	31/8/2020	
11	transformation of geometry	01/9/2020	
12	3D transformations, mathematics of projections	02/9/2020	
11	clipping	04/9/2020	
12	hidden surface removal	05/9/2020	
13	Revision of the above topics	07/9/2020	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-II GEOMETRIC MODELLING/DRAFTING AND MODELLING			
CO1: Able to UNNDERSTAND GEOMETRIC MODLLING AND DRAFTING			
T TB: PRINCIPLES CAD CAM BY PEARSON			
1	geometric modeling: Requirements	08/9/2020	Online Class with MS
2	geometric models	08/9/2020	
3	geometric construction models	09/9/2020	

4	curve representation methods	11/9/2020	Teams
5	surface representation methods	14/9/2020	
12	Modeling facilities desired.	14/9/2020	
11	Basic geometric commands	15/9/2020	
12	layers	17/9/2020	
11	display control commands	18/9/2020	
12	editing	19/9/2020	
11	dimensioning	21/9/2020	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-III PART PROGRAMMING			
CO1: Able to UNNDERSTAND PROGRAMMING			
T TB: IBRAHIM ZAHEED CAD CAM THEORY			
1	NC, NC modes	23/9/2020	Online Class with MS Teams
2	NC elements	24/9/2020	
3	structure of CNC machine tools	25/9/2020	
4	features of Machining center	26/9/2020	
5	CNC Part Programming	05/10/2020	
12	manual part programming methods	06/10/2020	
11	Computer Aided Part Programming	07/10/2020	
12	Direct Numerical Control	08/10/2020	
11	Adaptive Control	09/10/2020	
12	CNC machine tools	10/10/2020	
11	turning center	12/10/2020	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-IV GROUP TECHNOLOGY			
CO1: Able to Unnderstand group technology			
T TB: cnc and programming by Thomson			
1	group technology: Part family	13/10/2020	Online Class with MS
2	coding and classification	14/10/2020	
3	production flow analysis	16/10/2020	

4	types and advantages	19/10/2020	Teams
5	Computer aided processes planning	20/10/2020	
12	Computer aided processes planning importance	21/10/2020	
11	Computer aided processes planning types	26/10/2020	
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-V computer aided quality control CO1: Able to UNNDERSTAND computer aided quality control T TB: product manufacturing by chang			
1	computer aided quality control	27/10/2020	Online Class with MS Teams
2	Terminology used in quality control	28/10/2020	
3	use of computers in Quality control	01/11/2020	
4	Inspection methods	02/11/2020	
5	contact and noncontact types	05/11/20	
12	computer aided testing	07/11/20	
11	integration of CAQC with CAD/CAM	09/11/20	
No. of Periods	TOPIC	Date	
UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM T TB: cnc and programming by Thomson			
1	Types of manufacturing systems	05/11/20	Online Class with MS Teams
2	machine tools and related equipment	07/11/20	
3	material handling systems	09/11/20	
4	material requirement planning	10/11/20	
5	computer control systems	11/11/20	
12	human labor in manufacturing systems	13/11/20	
11	CIMS benefits	13/11/20	
12	Revision	14/11/20	

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Date: 17-8-2020

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Date:

17-8-2020

TENTATIVE LESSON PLAN: R1641033
FINITE ELEMENT METHODS

Course Title: FINITE ELEMENT METHODS		
Section : Sec A&B	Date : 17/08/20	Page No : 01 of 04
Revision No : 00	Prepared By : V.Pavan Kumar	Approved By : HOD

Tools: MS Teams, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO FEM			
CO1: To make the student learn and understand the basic principles of finite element analysis procedure			
TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.			
1	Introduction to finite element method	17/8/20	Online Class with MS Teams
2	stress and equilibrium	18/8/20	
3	strain – displacement relations	19/8/20	
4	stress – strain relations	21/8/20	
5	plane stress and plane strain conditions	24/8/20	
6	variational and weighted residual methods	26/8/20	
7	concept of potential energy	28/8/20	
8	one dimensional problems.	31/8/20	
9	one dimensional problems.	01/9/20	
10	one dimensional problems.	02/8/20	
11	one dimensional problems.	04/8/20	
12	one dimensional problems.	05/8/20	
13	one dimensional problems.	07/8/20	

UNIT-II 1-D Problems			
CO2: To learn the theory and characteristics of finite elements that represent engineering structures.			
TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall..C.S/World Scientific publications			
14	Discretization of domain	08/9/20	Online Class with MS Teams
15	element shapes	08/9/20	
16	discretization procedures	09/9/20	
17	assembly of stiffness matrix	11/9/20	
18	band width, node numbering, mesh generation	14/9/20	
19	interpolation functions, local and global coordinates	14/9/20	
20	interpolation functions, local and global coordinates	15/9/20	
21	convergence requirements	15/9/20	
UNIT-III Analysis of Trusses and beams:			
CO3: To make the student learn about analysis of Trusses and beams:, and their applications.			
TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.			
22	Finite element modeling	16/9/20	Online Class with MS Teams
23	coordinates and shape functions	18/9/20	
24	assembly of global stiffness matrix and load vector	19/9/20	
25	assembly of global stiffness matrix and load vector	23/9/20	
26	finite element equations	21/9/20	
27	simple problems on trusses	22/9/20	
28	finite element equations	23/9/20	
29	simple problems on beams	25/9/20	
30	simple problems on beams	26/9/20	

UNIT-IV Finite element modeling of two dimensional stress analysis; CST CO4:
To make students learn about Finite element modeling of two dimensional stress analysis; CST and formulation of axisymmetric problems.

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.

31	Finite element modeling of two dimensional stress analysis with constant strain triangles	05/10/20	Online Class with MS Teams
32	Finite element modeling of two dimensional stress analysis with constant strain triangles	06/10/20	
33	treatment of boundary conditions	07/10/20	
34	treatment of boundary conditions	08/10/20	
35	formulation of axisymmetric problems	09/10/20	
36	Problems on CST	10/10/20	
37	Problems on CST	12/10/20	
38	Problems on CST	13/10/20	
39	Problems on CST	14/10/20	

UNIT-V Higher order and isoparametric elements

CO5: To make students learn about Higher order and isoparametric elements

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.

40	Higher order and isoparametric elements	16/10/20	Online Class with MS Teams
41	Higher order and isoparametric elements	19/10/20	
42	One dimensional quadratic and cubic elements in natural coordinates	20/10/20	
43	One dimensional quadratic and cubic elements in natural coordinates	21/10/20	
44	two dimensional four noded isoparametric elements	26/10/20	
45	two dimensional four noded isoparametric elements	27/10/20	
46	numerical integration	28/10/20	

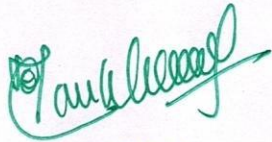
UNIT-VI Steady state heat transfer analysis and dynamic analysis
CO6: To make students to learn about Steady state heat transfer analysis and dynamic analysis

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall

47	Steady state heat transfer analysis : one dimensional analysis of a fin	02/11/20	Online Class with MS Teams
48	two dimensional analysis of thin plate	05/11/20	
49	analysis of a uniform shaft subjected to torsion	07/11/20	
50	Problems on heat transfer problems	09/11/20	
51	Problems on heat transfer problems	10/11/20	
52	Problems on heat transfer problems	11/11/20	
53	Dynamic Analysis: Formulation of finite	13/11/20	
54	Element consistent and lumped mass	13/11/20	
55	Evaluation of eigen values and eigen vectors	14/11/20	

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TENTATIVE PLAN: R1632034

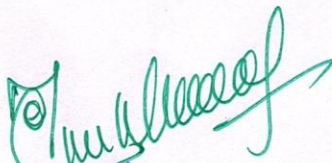
Course Title: POWER PLANT ENGINEERING		Course code: R1641034	
Section: Sec A&B	Date: 17-08-2020	Page No: 01 to 03	
Revision No: 00	Prepared By: U. TANOJ	Approved By: HOD	
Tools: PPTs & Videos			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I STEAM POWER PLANT CO1: Able to understand fundamentals of power plant layout & its equipment's & their uses TB: "POWER PLANT ENGINEERING", Er P.K.NAG.			
	UNIT-1: Steam Power Plant		Online class with MS Teams
1	Steam Power Plant Layout	18/08/20	
2	Working of different circuits	19/08/20	
3	Fuel and handling equipment's	20/08/20	
4	Types of coals, Coal handling	21/08/20	
5	Choice of handling equipment	25/08/20	
6	Coal storage, ash handling systems	26/08/20	
7	Combustion properties of coal	27/08/20	
8	Overfeed and underfeed fuel beds	28/08/20	
9	Travelling gate stokers, spreader stokers, retort stokers	29/08/20	
10	Pulverized fuel burning systems and its components	01/09/20	
11	Combustion needs and draught systems	02/09/20	
12	Cyclone furnace, design and construction	03/09/20	
13	Dust collectors, cooling towers and heat rejection	04/09/20	
14	Corrosion and feed water treatment	05/09/20	
UNIT-II INTERNAL COMBUSTION & GAS TURBINE POWER PLANTS CO2: Gain knowledge & become familiar with combustion of engines & Gas turbine plants TB: "POWER PLANT ENGINEERING", Er P.K.NAG.			
	UNIT – 2:Internal combustion		Online class with MS Teams
15	Internal combustion & Gas turbine power plants introduction	08/09/20	
16	Introduction about diesel engines	09/09/20	
17	Plant layout with auxiliaries	10/09/20	
18	Fuel supply systems	11/09/20	
19	Air starting equipment,	12/09/20	
20	Supercharging	15/09/20	
	Gas Turbine Power Plants	16/09/20	
21	Gas turbine power plant, introduction	16/09/20	
22	Classification,	17/09/20	
23	construction layout with auxiliaries	17/09/20	
24	Combined cycle power plants and comparison	18/09/20	
25	Problems on Gas turbine plants	19/09/20	
UNIT-III HYDRO ELECTRIC POWER PLANT & PROJECTS CO3: Able to understand fundamentals of Hydro Electric Power Plant layout & its projects TB:" POWER PLANT ENGINEERING", Er Arora & Domkundwar.			

	UNIT – 3: Hydro Electric Power Plant		Online class with MS Teams
25	Hydro Electric Power Plant introduction	22/09/20	
26	Water power	23/09/20	
27	Hydrological cycle/flow measurement	23/09/20	
28	Drainage area characteristics,	24/09/20	
29	hydrographs, storage and pondage		
30	Classification of dams and spill ways	24/09/20	
	Hydro Projects Plant		
31	Hydroelectric projects and plant-classification, typical layouts	24/09/20	
32	Typical layouts	25/09/20	
33	Plant auxiliaries,	25/09/20	
34	Plant operation,	26/09/20	
35	Pumped storage plants	26/09/20	
UNIT-IV NUCLEAR POWER STATION & TYPES OF REACTORS			
CO4: Able to understand fundamentals of Nuclear power station & its reactors principle			
TB: “POWER PLANT ENGINEERING”, Er Arora & Domkundwar.			
	UNIT – 4 NUCLEAR POWER STATION & REACTORS		Online class with MS Teams
37	Nuclear power station introduction	06/10/20	
38	Nuclear fuel, breeding and fertile materials	07/10/20	
39	Nuclear reactor, reactor operation	08/10/20	
40	Types of reactors-pressurized water reactors	09/10/20	
41	Boiling water reactor	10/10/20	
42	Sodium graphite reactor	13/10/20	
43	fast breeder reactor	14/10/20	
44	homogeneous reactor	15/10/20	
UNIT-V COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL			
CO5: Gain knowledge & become familiar with combined operations of power plants & its instrumentation control			
TB: “POWER PLANT ENGINEERING”, Er P.C. SHARMA.			
	UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL		Online class with MS Teams
45	Combined operations of different power plants- introduction	16/10/20	
46	Advantages of combined working,	17/10/20	
47	Load distortion between power stations	20/10/20	
48	Storage type hydroelectric power plant	21/10/20	
49	Pumped storage plant	22/10/20	
50	Coordination of hydro electric and gas turbine stations	23/10/20	
51	Coordination of hydroelectric and nuclear power station stations	23/10/20	
52	Coordination of different types of power plants	24/10/20	
53	Power plant instrumentation and control	27/10/20	
54	Importance of power plant	28/10/20	
55	Instrumentation in power plant	28/10/20	
56	Measurement of gas purity	29/10/20	
57	Gas analysis, oxygen and carbon dioxide	31/10/20	

58	Measurements, nuclear measurements	31/10/20	
UNIT-VI POWER PLANT ECONOMICS & ENVIRONMENTAL CONSIDERATIONS			
CO6: Able to understand fundamentals of Power Plant Economics & Environmental considerations			
TB: "POWER PLANT ENGINEERING", Er P.C. SHARMA.			
	UNIT – 6 POWER PLANT ECONOMICS & ENVIRONMENTAL CONSIDERATIONS		
59	Power plant economics and environmental considerations,	03/11/20	Online class with MS Teams
60	Capital cost	03/11/20	
61	General arrangement of power distribution	04/11/20	
62	Load curves	04/11/20	
63	Load duration curve	05/11/20	
64	Definition of connected load	05/11/20	
65	Maximum demand	06/11/20	
66	Demand factor,	06/11/20	
67	Average load, Load factor	06/11/20	
68	Diversity factor	07/11/20	
69	Effluents from power plants	07/11/20	
70	Related exercises	10/11/20	
71	Impact on environment	11/11/20	
72	Load duration curve	12/11/20	
73	Definition of connected load	12/11/20	
74	Instrumentation in power plant	13/11/20	
75	Measurement of gas purity	13/11/20	

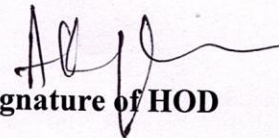


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TENTATIVE LESSON PLAN: R164103C ADDITIVE MANUFACTURING

Course Title: Additive Manufacturing		
Section: A&B	Date: 17/08/2020	Page No: 01 of 04
Revision No: 00	Prepared By :P. Bhagya Lakshmi	Approved By: HOD

Tools: PPTs & Videos

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION, LIQUID-BASED RAPID PROTOTYPING SYSTEMS			
CO1: Able to understand prototyping fundamentals, advantages and limitations of rapid prototyping, classifications of RP. And also able to identify the use of SLA, SGC for manufacturing of complex components.			
TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications			
1	INTRODUCTION: Prototyping fundamentals	17/08/20	Online class with MS Teams
2	historical development	18/08/20	
3	fundamentals of rapid prototyping	20/08/20	
4	advantages and limitations of rapid prototyping	21/08/20	
5	commonly used terms, classification of RP process	24/08/20	
6	LIQUID-BASED RAPID PROTOTYPING SYSTEMS: Stereo lithography Apparatus (SLA): models and specifications	25/08/20	
7	process, working principle	27/08/20	
8	photopolymers, photo polymerization	28/08/20	
9	layering technology, laser and laser scanning	29/08/20	
10	applications, advantages and disadvantages	31/08/20	
11	case studies	01/09/20	
12	Solid Ground Curing (SGC): models and specifications	03/09/20	
13	process, working principle	04/09/20	
14	applications, advantages and disadvantages	05/09/20	

15	case studies	05/09/20	
UNIT-II SOLID-BASED RAPID PROTOTYPING SYSTEMS			
CO2: Able to identify the use of LOM, FDM for manufacturing of complex components			
TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications			
16	Laminated object manufacturing (LOM) - models and specifications	07/09/20	Online class with MS Teams
17	process, working principle	08/09/20	
18	applications, advantages and disadvantages	10/09/20	
19	case studies	11/09/20	
20	Fused deposition modelling (FDM) - models and specifications	12/09/20	
21	process, working principle	14/09/20	
22	applications, advantages and disadvantages	15/09/20	
23	case studies	17/09/20	
UNIT-III POWDER BASED RAPID PROTOTYPING SYSTEMS			
CO3: Able to identify the use of SLS, 3DP for manufacturing of complex components			
TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications			
24	Selective laser sintering (SLS): models and specifications	18/09/20	Online class with MS Teams
25	process, working principle	19/09/20	
26	applications, advantages and disadvantages	21/09/20	
27	case studies	22/09/20	
28	three-dimensional printing (3DP): models and specifications	24/09/20	
29	process, working principle	25/09/20	
30	applications, advantages and disadvantages	26/09/20	

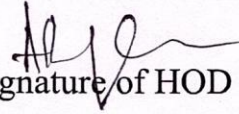
31	case studies	26/09/20	
UNIT-IV RAPID TOOLING CO4: Able to understand various indirect & direct tooling techniques TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications R1- Wohlers Report 2000 /Terry T Wohlers/Wohlers Associates			
32	RAPID TOOLING: Introduction to rapid tooling (RT), conventional tooling Vs RT	05/10/20	Online class with MS Teams
33	Need for RT, rapid tooling classification	05/10/20	
34	indirect rapid tooling methods: RTV epoxy tools, spray metal deposition	06/10/20	
35	Ceramic tools, investment casting	08/10/20	
36	spin casting, die casting	09/10/20	
37	sand casting	10/10/20	
38	3D Keltool process	12/10/20	
39	Direct rapid tooling: direct AIM	13/10/20	
40	LOM Tools, DTM Rapid Tool Process	15/10/20	
41	EOS Direct Tool Process	16/10/20	
42	Direct Metal Tooling using 3DP	16/10/20	
UNIT-V RAPID PROTOTYPING DATA FORMATS, RAPID PROTOTYPING SOFTWARE'S CO5: Able to understand RP data formats, features of RP softwares and also able to identify the STL file problems and their repair. TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications R1- Wohlers Report 2000 /Terry T Wohlers/Wohlers Associates			
43	RAPID PROTOTYPING DATA FORMATS: STL Format	17/10/20	
44	STL File Problems	17/10/20	Online

		19/10/20	class with MS Teams
45	consequence of building valid and invalid tessellated models	19/10/20	
46	STL file Repairs: Generic Solution	20/10/20	
47	other Translators	22/10/20	
48	Newly Proposed Formats	23/10/20	
49	RAPID PROTOTYPING SOFTWARE'S: Features of various RP software's : Magics	24/10/20	
50	Mimics, Solid View	26/10/20	
51	View Expert, 3 D View	27/10/20	
52	Velocity 2, Rhino	29/10/20	
53	STL View 3 Data Expert and 3 D doctor	31/10/20	
UNIT-VI RP APPLICATIONS			
CO6: Able to understand applications of RP in various industries & fields.			
TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications			
R1- Wohlers Report 2000 /Terry T Wohlers/Wohlers Associates			
54	RP APPLICATIONS: Application in engineering, analysis and planning	02/11/20	Online class with MS Teams
55	aerospace industry	03/11/20	
56	automotive industry	05/11/20	
57	jewelry industry	06/11/20	
58	coin industry	06/11/20	
59	GIS application, arts and architecture	07/11/20	
60	RP medical and bioengineering applications: planning and simulation of complex surgery	09/11/20	
61	customized implants & prosthesis	10/11/20	
62	design and production of medical devices	12/11/20	
63	forensic science and anthropology	13/11/20	

64	visualization of bimolecular	13/11/20	
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TENTATIVE LESSON PLAN: R164103D ADVANCED MATERIALS

Course Title: ADVANCED MATERIALS			
Section : Sec A&B	Date : 17/08/20	Page No : 01 of 04	
Revision No : 00	Prepared By :B.NAGENDRA	Approved By : HOD	
Tools: Black board, PPTs, GOOGLE MEET			
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION			
CO1: Become familiar with a basic concept of composite materials			
TB: "ADVANCED MATERIALS", M DANIEL ISSAC.			
1	Introduction	17/8/20	Online Class with GOOGLE MEET
2	Introduction, definition, classification of polymers	18/8/20	
3	classification of polymers, Polymer matrix composites	19/8/20	
4	Metal matrix composites, Ceramic matrix composites	21/8/20	
5	Metal matrix composites, Ceramic matrix composites	22/8/20	
6	Metal matrix composites, Ceramic matrix composites	24/8/20	
7	Metal matrix composites, Ceramic matrix composites	24/8/20	
8	Fiber-reinforced composites, nature made composites and application	26/8/20	
9	Fiber-reinforced composites, nature made composites and application	28/8/20	
10	Fiber-reinforced composites, nature made composites and application	31/8/20	
UNIT-II POLYMER COMPOSITES			
CO2: Gain knowledge about polymer composites			
TB: "ADVANCED MATERIALS", M DANIEL ISSAC.			
11	Fiber reinforcements, fiber, glass, silica	08/9/20	
12	Fiber reinforcements, fiber, glass, silica	08/9/20	
13	Fiber reinforcements of silica, Kevlar, carbon	09/9/20	
14	Fiber reinforcements of silica, Kevlar, carbon	11/9/20	
15	Fiber reinforcements of carbon, boron, silicon carbide	12/9/20	

16	Fiber reinforcements of carbon, boron, silicon carbide	12/9/20	Online Class with GOOGLE MEET
17	Fiber reinforcements of carbon, boron, silicon carbide	12/9/20	
18	Fiber reinforcement of silicon carbide, boron carbide	14/9/20	
19	Fiber reinforcement of silicon carbide, boron carbide	15/9/20	
20	Polymer composites, thermoplastic and thermosetting plastics	17/9/20	
21	Polymer composites, thermoplastic and thermosetting plastics	17/9/20	
22	Thermosetting plastic, and manufacturing of PMC	17/9/20	
23	Manufacturing of MMC, CCC and their application	18/9/20	
UNIT-III MANUFACTURING METHODS			
CO3: Become familiar with the concepts of MANUFACTURING METHODS			
TB: "ADVANCED MATERIALS", M DANIEL ISSAC.			
24	Autoclave manufacturing methods	18/9/20	Online Class with GOOGLE MEET
25	Autoclave manufacturing methods	19/9/20	
26	Autoclave manufacturing methods	19/9/20	
27	Molding methods, filament winding	19/9/20	
28	Molding methods, filament winding	21/9/20	
29	Filament winding, hand layup, pultrusion and RTM	23/9/20	
30	Filament winding, hand layup, pultrusion and RTM	25/9/20	
31	Filament winding, hand layup, pultrusion and RTM	26/9/20	
UNIT-IV MACROMECHANICAL ANALYSIS OF A LAMINA			
CO4: Gain knowledge about concept of Macromechanical analysis of lamina			
TB: "ADVANCED MATERIALS", M DANIEL ISSAC.			
32	Introduction, generalized hooks law	05/10/20	
33	Introduction, generalized hooks law	06/10/20	
34	Reduction of hooks law from 3D to 2D	07/10/20	

35	Reduction of hooks law from 3D to 2D	08/10/20	Online Class with GOOGLE MEET
36	Relation ship of compliance	09/10/20	
37	Relation ship of compliance	09/10/20	
38	Relation ship of compliance	10/10/20	
39	Stiffness matrix to engineering elastic constant	10/10/20	
40	Stiffness matrix to engineering elastic constant	12/10/20	
41	Orthotrofic lamina, laminate-laminate codes	13/10/20	
42	Orthotrofic lamina, laminate-laminate codes	14/10/20	
43	Orthotrofic lamina, laminate-laminate codes	14/10/20	
UNIT-V FUNCTIONALLY GRADED MATERIALS CO5: Become familiar with functional graded materials TB:“ADVANCED MATERIALS”, M DANIEL ISSAC.			
45	Types of functionally graded materials	16/10/20	Online Class with GOOGLE MEET
46	Types of functionally graded materials	19/10/20	
47	System preparations p properties of graded materials and applications of functionally graded, materials	19/10/20	
48	System preparations p properties of graded materials and applications of functionally graded, materials	20/10/20	
49	System preparations p properties of graded materials and applications of functionally graded, materials	20/10/20	
50	properties of graded materials and applications of functionally graded, materials	21/10/20	
51	Introduction to shape memory alloy, shape memory effect	26/10/20	
52	Classification of shape memory alloy composition	27/10/20	
53	Application of shape memory alloys	28/10/20	

UNIT-VI NANO MATERIALS			
CO6: Become familiar with concepts of NANO MATERIALS			
TB: "ADVANCED MATERIALS", M DANIEL ISSAC.			
54	Introduction and properties of nano materials	02/11/20	Online Class with GOOGLE MEET
55	Introduction and properties of nano materials	05/11/20	
56	Nano scales advantages and dis advantages	07/11/20	
57	Nano scales advantages and dis advantages	08/11/20	
58	Application in comparison with bulk materials	09/11/20	
59	Application in comparison with bulk materials	10/11/20	
60	State of art nano advanced and topic delivered by student	11/11/20	
61	State of art nano advanced and topic delivered by student	13/11/20	

B. Nagendra
Signature of Faculty

M. Sreejith
PRINCIPAL
SRK Institute of Technology
ENIKEPADU, VIJAYAWADA-521 108

A. J. J.
Signature of HOD