

TENTATIVE LESSON PLAN R192203 MECHANICAL ENGINEERING

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|--|---------------------------------|---------------------------|
| Course Title: COMPLEX VARIABLES AND STATISTICAL METHODS | | |
| Section : ME | Date : 01/04/2021 | 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 |
|---|--|--|---------------------------------------|
| UNIT- I: FUNCTIONS OF A COMPLEX VARIABLE AND COMPLEX INTEGRATION | | | |
| CO1: To apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic and find the differentiation and integration of complex functions used in engineering problems | | | |
| TB1 :: COMPLEX VARIABLES AND STATISTICAL METHODS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014. | | | |
| 1. | Introduction | From: 01/04/2021 To: 17/04/2021 | Lecture interspersed with discussions |
| 2. | Definition of Continuity, Problems | | |
| 3. | Problems | | |
| 4. | Differentiability, Problems | | |
| 5. | Problems | | |
| 6. | Analyticity, Problems | | |
| 7. | Problems, Properties | | |
| 8. | Cauchy-Riemann equations in Cartesian, Problems | | |
| 9. | Problems | | |
| 10. | Cauchy-Riemann equations polar Coordinates, Problems | | |
| 11. | Tutorial Class | | |
| 12. | Harmonic and conjugate harmonic functions | | |
| 13. | Problems | | |
| 14. | Milne –Thompson method Problems | | |
| 15. | Complex integration: Line integral Problems | | |
| 16. | Cauchy's integral theorem Problems | | |
| 17. | Cauchy's integral formula Problems | | |
| 18. | Generalized integral formula (all without proofs).Problems | | |
| 19. | Revision | | |
| UNIT- II : SERIES EXPANSIONS AND RESIDUE THEOREM | | | |
| CO2: To make use of the Cauchy residue theorem to evaluate certain integrals | | | |
| TB1 :: COMPLEX VARIABLES AND STATISTICAL METHODS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014. | | | |
| 20. | Radius of convergence | | |
| 21. | Expansion in Taylor's series, Problems | | |

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| 22. | Maclaurin's series, Problems | From: 19/04/2021 To: 04/05/2021 | Lecture interspersed with discussions |
| 23. | Laurent series, Problems | | |
| 24. | Types of Singularities: Isolated, Problems | | |
| 25. | pole of order m Problems | | |
| 26. | Tutorial Class | | |
| 27. | Essential Problems | | |
| 28. | Residues Problems | | |
| 29. | Residue theorem (without proof) Problems | | |
| 30. | Evaluation of real integral of the type $\int f(x)dx$ Problems | | |
| 31. | Revision | | |

UNIT III- PROBABILITY AND DISTRIBUTION

CO3 : To provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of discrete and Continuous Probability theory. To introduce students to the basic methodology of "probabilistic thinking" and to apply it to problems.

TB1 :: PROBABILITY AND STATISTICS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

TB2 :: COMPLEX VARIABLES AND STATISTICAL METHODS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

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| 32. | Review of probability and Baye's theorem | From: 05/05/2021 To: 31/05/2021 | Lecture interspersed with discussions |
| 33. | Baye's theorem- Problems | | |
| 34. | Random variables – Discrete and Continuous random variables | | |
| 35. | Distribution function and properties | | |
| 36. | Mathematical Expectation & Properties | | |
| 37. | Variance & Properties | | |
| 38. | Tutorial Class | | |
| 39. | Binomial Distribution-p.m.f, Properties, | | |
| 40. | Problems | | |
| 41. | Poisson Distribution-p.m.f, Properties | | |
| 42. | Problems | | |
| 43. | Uniform Distribution- p.d.f., properties | | |
| 44. | Problems | | |
| 45. | Normal Distribution- p.d.f., properties | | |
| 46. | normal Approximation to Binomial distribution | | |
| 47. | Problems | | |
| 48. | Revision | | |

UNIT – IV SAMPLING THEORY

CO4 : To the aim of this course is to cover sampling design and analysis methods that would be useful for research and management in many field. A well designed sampling procedure ensures that we can summarize and analyze data with a minimum of assumptions and complications.

TB1 :: PROBABILITY AND STATISTICS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

TB2 :: COMPLEX VARIABLES AND STATISTICAL METHODS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

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| 49. | Introduction- Population, Sample, Types of | | |
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| | Sampling, Parameter & Statistic | | |
| 50. | Sampling Distribution of Mean with Known Variance, Problems | From: 01/06/2021 To: 16/06/2021 | Lecture interspersed with discussions |
| 51. | Central Limit theorem | | |
| 52. | Sampling Distribution of Mean with Unknown Variance, Problems | | |
| 53. | Tutorial Class | | |
| 54. | t - distribution - Problems | | |
| 55. | F- distribution - Problems | | |
| 56. | Chi- Square Distribution - Problems | | |
| 57. | Point Estimation, Maximum Error Estimate - Problems | | |
| 58. | Interval Estimation - Problems | | |
| 59. | Maximum error of estimate - Problems. | | |
| 60. | Revision | | |

UNIT –V TESTS OF HYPOTHESIS

CO 5: One of the most important uses of statistics is to be able to make conclusions and test Hypothesis. Your conclusions can never be absolutely sure but you can quantify of your measure of confidence in the results.

TB1 :: PROBABILITY AND STATISTICS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

TB2 :: COMPLEX VARIABLES AND STATISTICAL METHODS By Dr. T.V.K. Iyengar, S. Chand & Company Pvt. Ltd., 2014.

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| 61 | Introduction – Hypothesis – Null and Alternative Hypothesis | | | | |
| 62 | Type I and Type II errors – Level of significance | From: 17/06/2021 To: 10/07/2021 | Lecture interspersed with discussions | | |
| 63 | One tail and two-tail tests | | | | |
| 64 | Large Sample tests - Test for Single Mean, Problems | | | | |
| 65 | Test for Two Means, Problems | | | | |
| 66 | Test for Single Proportion, Problems | | | | |
| 67 | Test for Two Proportion, Problems | | | | |
| 68 | Tutorial Class | | | | |
| 69 | Small Sample tests: Test for Single Mean, Problems | | | | |
| 70 | Test for Two Means, Problems | | | | |
| 71 | Test for Single Proportion, Problems | | | | |
| 72 | Test for Two Proportion, Problems | | | | |
| 73 | Problems | | | | |
| 74 | Revision | | | | |

Pragathi
11/4/2021
Signature of the Faculty

M. Lakshmi
PRINCIPAL

P. Ashok
Signature of the HOD

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TENTATIVE LESSON PLAN: R1922031
KINEMATICS OF MACHINERY

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|--|---|---------------------------|
| Course Title: KINEMATICS OF MACHINERY | | |
| Section : Sec A | Date : 1-4-2021 | 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. | | | |
| TB: | | | |
| 1 | Elements or Links – Classification – Rigid Link, flexible and fluid link | 1-4-2021 | Lecture interspersed with discussions |
| 2 | Types of kinematic pairs – sliding, turning, rolling, screw and spherical pairs | 3-4-2021 | |
| 3 | lower and higher pairs – closed and open pairs – constrained motion | 5-4-2021 | |
| 4 | completely, partially or successfully constrained and incompletely constrained | 6-4-2021 | |
| 5 | Khuzbrals criteria , Grashoff's law , Degrees of freedom | 7-4-2021 | |
| 6 | Kutzbach criterion for planar mechanisms, Mechanism and machines | 8-4-2021 | |
| 7 | classification of machines – kinematic chain – inversion of mechanism | 9-4-2021 | |
| 8 | Inversion of mechanism – inversions of quadric cycle, chain – single and double slider cranks chains. | 10-4-2021 | |
| UNIT-II LOWER PAIR MECHANISM | | | |
| CO2: The objective of this unit is to make student understand various mechanisms for straight line motion and their applications including steering mechanism. | | | |
| TB: | | | |
| 9 | Exact and approximate copiers and generated types – Peaucellier | 12-4-2021 | |
| 10 | Hart and Scott Russel – Grasshopper – Watt T. | 15-4-2021 | |

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| | Chebicheff | | Lecture interspersed with discussions |
| 11 | Robert Mechanisms and straight line motion, Pantograph | 16-4-2021 | |
| 12 | Conditions for correct steering – Davis Steering gear | 17-4-2021 | |
| 13 | Ackermans steering gear | 19-4-2021 | |
| 14 | velocity ratio; Hooke's Joint: Single and double | 20-4-2021 | |
| 15 | Universal coupling–application–problems. | 22-4-2021 | |

UNIT-III KINEMATICS

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.

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| 16 | Velocity and acceleration – Motion of a link in machine | 23-4-2021 | Lecture interspersed with discussions |
| 17 | Determination of Velocity and acceleration diagrams – Graphical method | 24-4-2021 | |
| 18 | Application of relative velocity method four bar chain. | 26-4-2021 | |
| 19 | Velocity and acceleration analysis of for a given mechanism | 27-4-2021 | |
| 20 | Kleins construction, Coriolis acceleration, determination of Coriolis component of acceleration. | 28-4-2021 | |
| 21 | Plane motion of body: Instantaneous center of rotation, centroids and axodes | 1-5-2021 | |
| 22 | relative motion between two bodies – Three centres in line theorem | 3-5-2021 | |
| 23 | Graphical determination of instantaneous centre | 4-5-2021 | |
| 24 | diagrams for simple mechanisms and determination of angular velocity of points and links | 5-5-2021 | |

UNIT-IV CAMS

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

TB:

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|----|---|-----------|---------------------------------------|
| 25 | Definitions of cam and followers – their uses | 6-5-2021 | Lecture interspersed with discussions |
| 26 | Types of followers and cams | 7-5-2021 | |
| 27 | Terminology –Types of follower motion | 8-5-2021 | |
| 28 | Uniform velocity, Simple harmonic motion and uniform acceleration and retardation | 10-5-2021 | |
| 29 | Maximum velocity | 11-5-2021 | |
| 30 | maximum acceleration during outward and return strokes in the above 3 cases. | 12-5-2021 | |
| 31 | Analysis of motion of followers | 13-5-2021 | |
| 32 | Roller follower | 15-5-2021 | |
| 33 | Circular cam with straight | 17-5-2021 | |
| 34 | concave and convex flanks | 18-5-2021 | |

UNIT-V GEARS

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.

TB:

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| 35 | Higher pairs, friction wheels | 19-5-2021 | Lecture interspersed with discussions |
| 36 | toothed gears–types | 20-5-2021 | |
| 37 | law of gearing | 21-5-2021 | |
| 38 | condition for constant velocity ratio for transmission of motion | 22-5-2021 | |
| 39 | Form of teeth: cycloidal and involute profiles | 24-5-2021 | |
| 40 | Velocity of sliding –phenomena of interferences | 25-5-2021 | |
| 41 | Methods of interference | 26-5-2021 | |
| 42 | Condition for minimum number of teeth to avoid interference, | 27-5-2021 | |

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| 43 | expressions for arc of contact and path of contact | 1-6-2021 | |
| 44 | Introduction to Helical | 2-6-2021 | |
| 45 | Bevel | 3-6-2021 | |
| 46 | Worm gearing | 4-6-2021 | |


UNIT-V GEAR TRAINS

CO5: The objective of this unit is to make student understand various power transmission mechanisms and methodologies and working principles. Students are exposed to merits and demerits of each drive

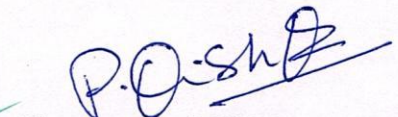
TB:

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| 47 | introduction | 5-6-2021 | Lecture interspersed with discussions |
| 48 | Belt and rope drives | 7-6-2021 | |
| 49 | Selection of belt drive | 8-6-2021 | |
| 50 | Types of belt drives | 9-6-2021 | |
| 51 | V-belts | 10-6-2021 | |
| 52 | Materials used for belt and rope drives | 11-6-2021 | |
| 53 | Velocity ratio of belt drives | 12-6-2021 | |
| 54 | Slip of belt, creep of belt | 14-6-2021 | |
| 55 | Tensions for flat belt drive | 15-6-2021 | |
| 56 | Angle of contact | 16-6-2021 | |
| 57 | Centrifugal tension | 17-6-2021 | |
| 58 | Maximum tension of belt | 18-6-2021 | |
| 59 | Chains- length, angular speed ratio | 19-6-2021 | |
| 60 | Classification of chains | 21-6-2021 | |
| 61 | Introduction to gear Trains, Train value | 1-7-2021 | |

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| 62 | Types – Simple and reverted wheel train | 2-7-2021 | |
| 63 | Epicyclic gear Train | 3-7-2021 | |
| 64 | Methods of finding train value or velocity ratio | 5-7-2021 | |
| 65 | Epicyclic gear trains | 6-7-2021 | |
| 66 | Selection of gear box | 8-7-2021 | |
| 67 | Differential gear for an automobile. | 10-7-2021 | |


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TENTATIVE LESSON PLAN: R1922033

| | | | |
|---|--|------------------------------|---------------------------------------|
| Course Title: APPLIED THERMODYNAMICS | | Course code: R1922033 | |
| Section : Sec A | Date :1/04/2021 | 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 VAPOUR POWER CYCLES | | | |
| CO1:Expected to learn he working of steam power cycles and also should be able to analyze and evaluate he performance of individual components | | | |
| TB: "THERMAL ENGINEERING BY R.K RAJPUT LAXMI PUBLICATIONS, | | | |
| 1 | Rankine cycle - schematic layout | 01/04/2021 | Lecture interspersed with discussions |
| 2 | thermodynamic analysis | 02/04/2021 | |
| 3 | Problems on Rankine cycle | 03 /04/2021 | |
| 4 | concept of mean temperature of heat addition | 04/04/2021 | |
| 5 | methods to improve cycle performance | 06/04/2021 | |
| 6 | regeneration | 07/04/2021 | |
| 7 | Problems on regeneration | 08/04/2021 | |
| 8 | reheating | 09/03/2021 | |
| 9 | Problems on reheating | 10/04/2021 | |
| 10 | combustion: fuels and combustion | 13/04/2021 | |
| 11 | concepts of heat of reaction | 14/04/2021 | |
| 12 | adiabatic flame temperature | 15/04/2021 | |
| 13 | Stoichiometry, flue gas analysis | 16/04/2021 | |
| 14 | Problem | 17/04/2021 | |
| 15 | Problem | 18/04/2021 | |
| 16 | Problem | 19/04/2021 | |
| UNIT-II BOILERS | | | |
| CO2: Student is able to learn.principles of combustion, stoichiometry and gas analysys | | | |
| TB: "THERMAL ENGINEERING BY R.K RAJPUT LAXMI PUBLICATIONS | | | |
| 17 | Classification | 19/04/2021 | Lecture interspersed with discussions |
| 18 | working principles of L.P & H.P boilers with sketches | 20/04/2021 | |
| 19 | working principles of L.P & H.P boilers with sketches | 21/04/2021 | |
| 20 | mountings– working principles | 22/04/2021 | |
| 21 | accessories– working principles | 23/04/2021 | |
| 22 | boiler horse power, equivalent evaporation, efficiency | 24/04/2021 | |
| 23 | heat balance | 25/04/2021 | |
| 24 | draught, classification | 26/04/2021 | |
| 25 | height of chimney for given draught and | 27/04/2021 | |

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| | discharge | | |
| 26 | condition for maximum discharge, efficiency of chimney | 28/04/2021 | |
| 27 | Problem | 29/04/2021 | |
| 28 | problems | 29/04/2021 | |
| 29 | Problems | 30/04/2021 | |

UNIT-III STEAM NOZZLE, STEAM TURBINES IMPULSE TURBINES
CO3 ; student will able design the components and calculate the losses and efficiency of boilers, nozzles and impulse turbine

TB: "THERMAL ENGINEERING BY R.K RAJPUT LAXMI PUBLICATIONS

| | | | |
|----|--|------------|---------------------------------------|
| 30 | STEAM NOZZLES :Function of a nozzle – applications - types, | 02/05/2021 | Lecture interspersed with discussions |
| 31 | flow through nozzles, thermodynamic analysis – assumptions | 03/05/2021 | |
| 32 | velocity of fluid at nozzle exit-Ideal and actual expansion in a nozzle | 04/05/2021 | |
| 33 | velocity coefficient, condition for maximum discharge | 05/05/2021 | |
| 34 | critical pressure ratio, criteria to decide nozzle shape | 06/05/2021 | |
| 35 | Super saturated flow, its effects, degree of super saturation | 07/05/2021 | |
| 36 | degree of under cooling - Wilson line | 10/05/2021 | |
| 37 | STEAM TURBINES: Classification – impulse turbine; mechanical details | 11/05/2021 | |
| 38 | velocity diagram – effect of friction – power developed | 12/05/2021 | |
| 39 | axial thrust, blade or diagram efficiency – condition for maximum efficiency | 13/05/2021 | |
| 40 | De-laval turbine - methods to reduce rotor speed- | 14/05/2021 | |

UNIT-4 ROTARY TURBINES AND CONDENSERS

Co4. student will able design THE components and calculate the losses and efficiency of reaction turbines

TB: "THERMAL ENGINEERING BY R.K RAJPUT LAXMI PUBLICATIONS.

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| 41 | velocity and pressure variation along the flow – combined velocity diagram for a velocity compounded impulse turbine, condition for maximum efficiency | 15/05/2021 | Lecture interspersed with discussions |
| 42 | Introduction to reaction turbine | 17/05/2021 | |
| 43 | Mechanical details – principle of operation | 18/05/2021 | |
| 44 | thermodynamic analysis of a stage, degree of reaction | 19/05/2021 | |

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| 45 | velocity diagram – Parson's reaction turbine | 21/05/2021 | |
| 47 | classification air compressors | 24/05/2021 | |
| 48 | Reciprocating compressors construction details | 26/05/2021 | Lecture interspersed with discussions |
| 49 | Single stage reciprocating compressor | 28/05/2021 | |
| 50 | Isothermal work calculations with clearance without clearance | 01/06/2021 | |
| 51 | Multistage compression, expression for isothermal work | 03/06/2021 | |
| 52 | Problems on reciprocating compressor | 05/06/2021 | |
| 53 | Rotary compressor –centrifugal compressor | 07/06/2021 | |
| 54 | Velocity triangles calculations of work done and efficiency | 08/06/2021 | |
| 55 | Axial compressor function | 10/06/2021 | Lecture interspersed with discussions |
| 56 | Choking and surging phenomenon in compressors | 14/06/2021 | |
| 57 | Vanes blower | 15/06/2021 | |
| 58 | Roots blower | 17/06/2021 | |
| 59 | Comparison of reciprocating and centrifugal | 20/06/2021 | |
| 60 | Comparison of centrifugal and axial compressors | 24/06/2021 | |
| 61 | problems | 26/06/2021 | |
| 62 | problems | 28//06/2021 | |
| 63 | problems | 30/06/2021 | |


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TENTATIVE LESSON PLAN: R1922033 FLUID MECHANICS & HYDRAULIC MACHINES

| | | |
|---|---|---------------------------|
| Course Title: FLUID MECHANICS & HYDRAULIC MACHINES | | |
| Section : Sec A | Date : 23/03/2021 | 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 | | | |
| CO1: After studying this unit student will know the concept of fluid and its properties, manometry, hydrostatic forces acting on different surfaces and also problem solving techniques. | | | |
| TB: Fluid Mechanics- Fundamentals and Applications by Y.A. Cengel, J.M.Cimbala, 6th Edn, McGrawHill | | | |
| 1 | Dimensions and units: physical properties of fluids | 22/03/2021 | Lecture interspersed with discussions |
| 2 | specific gravity, viscosity and its significance | 24/03/2021 | |
| 3 | surface tension, capillarity, vapor pressure | 24/03/2021 | |
| 4 | Atmospheric, gauge and vacuum pressure | 25/03/2021 | |
| 5 | Measurement of pressure – Manometers | 26/03/2021 | |
| 6 | Piezometer, U-tube, inverted and differential manometers | 27/03/2021 | |
| 7 | Pascal's & hydrostatic laws | 31/03/2021 | |
| 8 | Buoyancy and floatation, Meta center | 31/03/2021 | |
| 9 | stability of floating body, Submerged bodies | 01/04/2021 | |
| 10 | Calculation of metacenter height | 02/04/2021 | |
| 11 | Stability analysis of buoyancy and floatation | 03/04/2021 | |
| 12 | applications of buoyancy | 05/04/2021 | |
| UNIT-II | | | |
| CO2: In this unit student will be exposed to the basic laws of fluids, flow patterns,viscous flow through ducts and their corresponding problems. | | | |
| TB: Fluid Mechanics- Fundamentals and Applications by Y.A. Cengel, J.M.Cimbala, 6th Edn, McGrawHill | | | |
| 13 | Fluid kinematics: Introduction, flow types | 07/04/2021 | |

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| 14 | Equation of continuity for one dimensional flow | 08/04/2021 | Lecture interspersed with discussions |
| 15 | circulation and vorticity | 09/04/2021 | |
| 16 | Stream line, path line and streak lines, stream tube | 10/04/2021 | |
| 17 | Stream function and velocity potential function | 12/04/2021 | |
| 18 | differences and relation between them | 15/04/2021 | |
| 19 | Condition for irrotational flow | 16/04/2021 | |
| 20 | flow net, source and sink | 17/04/2021 | |
| 21 | doublet and vortex flow | 19/04/2021 | |
| 22 | Fluid dynamics: surface and body forces | 22/04/2021 | |
| 23 | Euler's for flow along a stream line | 23/04/2021 | |
| 24 | Bernoulli's equations for flow along a stream line | 24/04/2021 | |
| 25 | momentum equation, Applications of momentum equation | 26/04/2021 | |
| 26 | force on pipe bend | 28/04/2021 | |
| 27 | Closed conduit flow: Reynold's experiment | 29/04/2021 | |
| 28 | Darcy Weisbach equation | 30/04/2021 | |
| 29 | Minor losses in pipes | 01/05/2021 | |
| 30 | pipes in series and pipes in parallel | 03/05/2021 | |
| 31 | total energy line-hydraulic gradient line | 05/05/2021 | |

UNIT-III

CO3:At the end of this unit student will be aware of the concepts related to boundary layer theory, flow separation, basic concepts of velocity profiles, dimensionless numbers and dimensional analysis.

TB:Fluid Mechanics and Hydraulic Machines - RK Bansal- Laxmi Publications (P) Ltd.

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|----|---|------------|---------------------------------------|
| 32 | Boundary Layer Theory: Introduction | 05/05/2021 | Lecture interspersed with discussions |
| 33 | momentum integral equation | 06/05/2021 | |
| 34 | Displacement, momentum and energy thickness | 13/05/2021 | |
| 35 | separation of boundary layer | 15/05/2021 | |
| 36 | control of flow separation | 17/05/2021 | |
| 37 | Stream lined body | 19/05/2021 | |
| 38 | Bluff body and its applications | 20/05/2021 | |
| 39 | basic concepts of velocity profiles | 21/05/2021 | |
| 40 | Dimensional Analysis: Dimensions and Units | 22/05/2021 | |
| 41 | Dimensional Homogeneity | 24/05/2021 | |
| 42 | Non dimensionalization of equations | 26/05/2021 | |
| 43 | Method of repeating variables | 26/05/2021 | |
| 44 | Buckingham Pi Theorem | 27/05/2021 | |

UNIT-IV

CO4:In this unit student will know the hydrodynamic forces acting on vanes and performance evaluation of hydraulic turbines.

TB:Fluid Mechanics and Hydraulic Machines - RK Bansal- Laxmi Publications (P) Ltd.

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| 45 | Basics of turbo machinery: hydrodynamic force of jets on stationary, inclined, and curved vanes | 28/05/2021 | Lecture interspersed with discussions |
| 46 | hydrodynamic force of jets on moving flat, inclined, and curved vanes | 29/05/2021 | |
| 47 | jet striking centrally and at tip | 31/05/2021 | |
| 48 | velocity diagrams, work done and efficiency, flow over radial vanes | 02/06/2021 | |
| 49 | Hydraulic Turbines: classification of turbines | 02/06/2021 | |
| 50 | impulse and reaction turbines | 03/06/2021 | |

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| 51 | Pelton wheel | 04/06/2021 | |
| 52 | Francis turbine and Kaplan turbine-working proportions | 05/06/2021 | |
| 53 | work done, efficiencies, hydraulic design | 09/06/2021 | |
| 54 | draft tube- theory- functions and efficiency | 10/06/2021 | |

UNIT-V

CO5:After studying this unit student will be in a position to understand the characteristic curves of hydraulic turbines and also evaluate the performance characteristics of hydraulic pumps.

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

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| 55 | Performance of hydraulic turbines: Geometric similarity, Unit and specific quantities | 11/06/2021 | Lecture interspersed with discussions |
| 56 | characteristic curves | 12/06/2021 | |
| 57 | governing of turbines | 14/06/2021 | |
| 58 | selection of type of turbine, cavitation, surge tank, water hammer | 16/06/2021 | |
| 59 | Hydraulic systems- hydraulic ram, hydraulic lift, hydraulic coupling | 17/06/2021 | |
| 60 | Fluidics – amplifiers, sensors and oscillators | 18/06/2021 | |
| 61 | Advantages, limitations and applications of hydraulic turbines | 19/06/2021 | |
| 62 | Centrifugal pumps: classification, working | 21/06/2021 | |
| 63 | work done – manometric head- losses and efficiencies | 23/06/2021 | |
| 64 | specific speed- pumps in series and parallel | 24/06/2021 | |
| 65 | performance characteristic curves, cavitation & NPSH | 25/06/2021 | |
| 66 | Reciprocating pumps: Working, Discharge, | 28/06/2021 | |

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| | slip | | |
| 67 | indicator diagrams | 30/06/2021 | |

Signature of Faculty

Signature of HOD

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ENIKEPADU, VIJAYAWADA-521 108

TENTATIVE LESSON PLAN: R1922034

| Course Title: METAL CUTTING AND MACHINE TOOLS | | Course code: R1922034 | |
|---|---|------------------------------|---------------------------------------|
| Section : Sec A | Date : 22/03/20 | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By: D.HARITHA BRAHMA | Approved By : HOD | |
| Tools: Black Board, MS teams, Google meet, PPT'S. | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I FUNDAMENTAL OF MACHINING CO1: Students will be able to understand the fundamental knowledge and principals in material removal processes. TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition | | | |
| 1 | Elementary treatment of metal cutting | 22/03/20 | Lecture interspersed with discussions |
| 2 | Elements of cutting processes | 22/03/20 | |
| 3 | Geometry of single point cutting tool | 23/03/20 | |
| 4 | Tool angles, chip formation, types of chips | 24/03/20 | |
| 5 | Built-up edge and its effects | 24/03/20 | |
| 6 | Chip breakers , mechanics of orthogonal cutting | 25/03/20 | |
| 7 | Merchants force diagram, cutting forces | 25/03/20 | |
| 8 | Cutting speed, feed and depth of cut& velocity ratios | 27/03/20 | |
| 9 | Tool life , tool wear, mach inability | 27/03/20 | |
| 10 | Problems on merchant circle diagram and tool life equation. | 30/03/20 | |
| 11 | Economics of machining, coolants, tool material and properties. | 31/03/20 | |
| UNIT-II LATHE MACHINES CO2: Students will acquire the knowledge on operations on conventional, automatic, capstan and turret lathes. TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition. | | | |
| 12 | Principle of working, specifications of lathes | 03/04/20 | Lecture interspersed with discussions |
| 13 | Types of lathes, work holders and tool holders | 06/04/20 to 07/04/20 | |
| 14 | Lathe operations and attachments | 08/04/20 | |
| 15 | Box tools, taper turning | 10/04/20 | |
| 16 | Thread cutting for lathes | 12/04/20 | |
| 17 | Constructional features of speed and feed gear box | 17/04/20 | |
| 18 | Turret and capstan lathes, collet chucks | 19/04/20 | |
| 19 | Other work and tool holding devices | 20/04/20 | |
| 20 | Principle features of automatic lathes | 22/04/20 | |

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| 21 | Classification of automatic lathes, single and multi spindle lathes | 24/04/20 | |
| 22 | Tool layout and cam design for automates | 26/04/20 | |

UNIT-III SHAPING, SLOTTING, PLANNER, DRILLING AND BORING MACHINES
CO3: Students are capable of understanding the working principles and operation of shaping, slotting, planning, drilling and boring machines.

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

| | | | |
|----|--|----------|---------------------------------------|
| 23 | Working principle and principle parts of shaper | 27/04/20 | Lecture interspersed with discussions |
| 24 | Specifications & principle of operation of shaper | 28/04/20 | |
| 25 | Machining time calculations of shaper | 29/04/20 | |
| 26 | Slider crank mechanism | 03/05/20 | |
| 27 | Principle parts, operations performed on slotter | 04/05/20 | |
| 28 | Machining time calculations of slotter & principle of working of planner | 05/05/20 | |
| 29 | Principle parts , operations performed on planner | 06/05/20 | |
| 30 | Working specifications, types of drilling machines | 08/05/20 | |
| 31 | Operations performed and tool holding devices of drilling machines | 10/05/20 | |
| 32 | Geometry of twist drills | 11/05/20 | |
| 33 | Machining time calculations for drills | 12/05/20 | |
| 34 | Twist drills and types | 13/05/20 | |
| 35 | Machining time calculations of planner | 15/05/20 | |
| 36 | Boring machines, fine boring machines | 17/05/20 | |
| 37 | Jig boring machine, deep hole drilling machines | 18/05/20 | |

UNIT-IV MILLING MACHINES

CO4: Students will be able to make gear and keyway in milling machines and understanding the indexing mechanisms.

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

| | | | |
|----|--|----------|---------------------------------------|
| 38 | Principles of working of milling machines | 19/05/20 | Lecture interspersed with discussions |
| 39 | Specifications, classification of milling machines | 20/05/20 | |
| 40 | Principle features of horizontal and vertical milling machines | 22/05/20 | |
| 41 | Universal milling machines | 24/05/20 | |
| 42 | Machining operations, types of cutter | 25/05/20 | |
| 43 | Geometry of milling cutter | 26/05/20 | |
| 44 | Methods of indexing | 27/05/20 | |
| 45 | Accessories to milling machines | 28/05/20 | |
| 46 | Cutting speed, feed, machining time | 29/05/20 | |

UNIT-V FINISHING PROCESSES

CO5: Students will be able to understand the different types of unconventional machining methods and principles of finishing processes.

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

| | | | |
|----|--|----------|---------------------------------------|
| 47 | Theory of grinding | 01/06/20 | Lecture interspersed with discussions |
| 48 | Classification of grinding machines | 02/06/20 | |
| 49 | Cylindrical & surface grinding machines | 03/06/20 | |
| 50 | Tools and cutter grinding machines | 04/06/20 | |
| 51 | Different types of abrasives | 05/06/20 | |
| 52 | Bonds and specifications | 07/06/20 | |
| 53 | Selection of grinding wheel | 08/06/20 | |
| 54 | Lapping , honing operations | 10/06/20 | |
| 55 | Broaching operations | 11/06/20 | |
| 56 | Lapping , honing, broaching operation compared to grinding | 12/06/20 | |

Signature of Faculty
Date:

Signature of HOD

Date: 10/04/21

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ENIKEPADU, VIJAYAWADA-521 108

TENTATIVE LESSON PLAN: R1922035
DESIGN OF MACHINE MEMBERS-I

| Course Title: DESIGN OF MACHINE MEMBERS-I | | Course code: R1922035 | |
|--|--|------------------------------|---------------------------------------|
| Date : 22/03/2021 | | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By: R. KARUN KUMAR | | Approved By : HOD |
| Tools: BLACK BOARD, PPTs | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION | | | |
| CO1: Able to Calculate different stresses in the machine components subjected to various static loads, failures and suitability of a material for an engineering application. | | | |
| TB 1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications. | | | |
| 1 | General in the design of Engineering Materials | 22-03-21 | Lecture interspersed with discussions |
| 2 | Mechanical properties ,Manufacturing consideration in design | 24-03-21 | |
| 3 | Tolerances and fits | 24-03-21 | |
| 4 | BIS codes of steels. | 25-03-21 | |
| 5 | STRESSES IN MACHINE MEMBERS: Simple stresses | 26-03-21 | |
| 6 | combined stresses —torsional and bending stresses | 27-03-21 | |
| 7 | Impact stresses — stress strain relation | 31-03-21 | |
| 8 | various theories of failure | 31-03-21 | |
| 9 | Factor of safety , design for strength and rigidity | 01-04-21 | |
| 10 | preferred numbers, the concept of stiffness | 02-04-21 | |
| 11 | The concept of stiffness in tension, bending | 03-04-21 | |
| 12 | Static strength design based on fracture toughness | 05-04-21 | |
| 13 | Problems on theories of failures | 07-04-21 | |
| UNIT-II STRENGTH OF MACHINE ELEMENTS | | | |
| CO2: Able to Calculate dynamic stresses in the machine components subjected to variable loads. | | | |
| TB 1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications. | | | |
| 14 | Stress concentration | 08-04-21 | Lecture interspersed with discussions |
| 15 | theoretical stress concentration factor | 09-04-21 | |
| 16 | fatigue stress concentration factor notch sensitivity | 10-04-21 | |
| 17 | design for fluctuating stresses | 12-04-21 | |

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| 18 | endurance limit, estimation of endurance strength | 15-04-21 | |
| 19 | Problems on Stress concentration factor | 16-04-21 | |
| 20 | Problems on endurance limit | 17-04-21 | |
| 21 | S-N curve, problems on S-N curve | 19-04-21 | |
| 22 | Goodman ' s line, problems | 22-04-21 | |
| 23 | Soderberg's line, problems | 23-04-21 | |
| 24 | Problems on Goodman ' s line | 24-04-21 | |
| 25 | modified goodman's line, Gerber's parabola | 26-04-21 | |

UNIT-III Riveted and welded joints

CO3: Able to Design riveted, welded, bolted joints, keys, cotters and knuckle joints subjected to static loads and their failure modes

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

| | | | |
|----|--|----------|---------------------------------------|
| 26 | design of joints with initial stresses | 28-04-21 | Lecture interspersed with discussions |
| 27 | eccentric loaded welded joints | 29-04-21 | |
| 28 | design of bolts with pre-stresses | 30-04-21 | |
| 29 | design of joints under eccentric loading | 01-05-21 | |
| 30 | locking devices – bolts of uniform strength. | 03-05-21 | |
| 31 | Problems on riveted joints | 05-05-21 | |
| 32 | Problems on welded joints | 05-05-21 | |
| 33 | Problems on bolted joints | 06-05-21 | |
| 34 | eccentric loaded welded joints | 13-05-21 | |
| 35 | KEYS, COTTERS AND KNUCKLE JOINTS | 15-05-21 | |
| 36 | Introduction , Design of keys | 17-05-21 | |
| 37 | stresses in keys | 19-05-21 | |
| 38 | cotter joints | 20-05-21 | |
| 39 | spigot and socket, sleeve and cotter | 21-05-21 | |
| 40 | jib and cotter joints- knuckle joints | 22-05-21 | |

UNIT-IV SHAFTS


CO4: Able to Design the machine shafts and suggest suitable coupling for a given application.

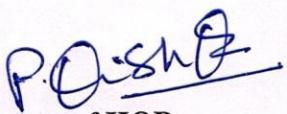
TB 1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw Hill Education Private Limited publications.

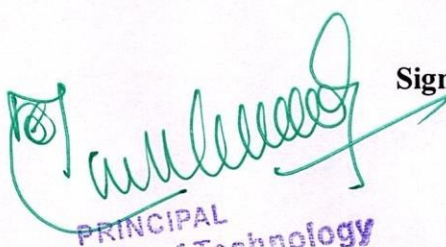
| | | | |
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| 41 | Design of solid and hollow shafts for strength and rigidity | 24-05-21 | Lecture interspersed with discussions |
| 42 | design of shafts for combined bending and axial loads | 26-05-21 | |
| 43 | shaft sizes— BIS code, Use of internal and external circlips | 26-05-21 | |
| 44 | gaskets and seals, problems | 27-05-21 | |
| 45 | problems | 28-05-21 | |
| 46 | Rigid couplings | 29-05-21 | |

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| 47 | muff, split muff couplings | 31-05-21 | |
| 48 | flange couplings | 02-06-21 | |
| 49 | rigid flanged coupling | 02-06-21 | |
| 50 | protected rigid flanged coupling, | 03-06-21 | |
| 51 | Bushed pin type flexible coupling | 04-06-21 | |
| 52 | Problems on flange couplings, Rigid couplings | 05-06-21 | |
| 53 | Problems on flexible couplings | 09-06-21 | |
| | | | |
| UNIT-V MECHANICAL SPRINGS | | | |
| CO5: Able to Design 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. | | | |
| 54 | Stresses and deflections of helical springs | 10-06-21 | Lecture interspersed with discussions |
| 55 | Extension springs | 11-06-21 | |
| 56 | compression springs | 12-06-21 | |
| 57 | springs for fatigue loading | 14-06-21 | |
| 58 | energy storage capacity | 16-06-21 | |
| 59 | helical torsion springs | 17-06-21 | |
| 60 | co-axial springs | 18-06-21 | |
| 61 | leaf springs | 19-06-21 | |
| 62 | Problems on springs | 21-06-21 | |
| 63 | Problems on helical torsion springs | 23-06-21 | |
| 64 | Problems on leaf springs | 24-06-21 | |
| 65 | Problems on compression springs | 25-06-21 | |
| 66 | Problems on springs | 28-06-21 | |
| 67 | Previous papers | 30-06-21 | |
| | | | |

TB 1:“DESIGN OF MACHINE ELEMENTS”, V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.


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TENTATIVE LESSON PLAN: R1632031 METROLOGY

| | | |
|--------------------------------|------------------------------------|---------------------------|
| Course Title: Metrology | | |
| Section : Sec I | Date : 22/03/21 | Page No : 01 of 04 |
| Revision No : 00 | Prepared By : V.Pavan Kumar | Approved By : HOD |

Tools: Black board, PPTs

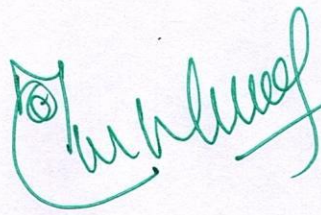
| No. of Periods | TOPIC | Date | Mode of Delivery |
|---|---|----------|---------------------------------------|
| UNIT-I Systems Of Limits And Fits | | | |
| CO1: Design of part, tolerances and fits. | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 1 | Introduction, nominal size, tolerance | 22/3/21 | Lecture interspersed with discussions |
| 2 | Limits, Deviations. | 23/3/21 | |
| 3 | Unilateral and bilateral tolerance system, fits | 24/3/21 | |
| 4 | Hole and Shaft basis systems | 25/3/21 | |
| 5 | Interchangeability, deterministic & statistical tolerancing, selective assembly | 27/3/21 | |
| 6 | International standard system of tolerances. | 30/3/21 | |
| 7 | Selection of limits and tolerances for correct functioning. | 31/3/21 | |
| 8 | Problems on limits and tolerances | 01/04/21 | |
| UNIT-II Linear Measurement; Measurement Of Angles And Tapers; Limit Gauges | | | |
| CO2: Inspection of engineering parts with various precision instruments. | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers. | | | |
| 9 | Length standards, end standards | 05/04/21 | |
| 10 | Slip gauges- calibration of the slip gauges | 06/04/21 | |
| 11 | Dial indicators | 08/04/21 | |
| 12 | Micrometers | 10/04/21 | |
| 13 | Measurement of angles by bevel protractor, angle slip gauges | 12/04/21 | |

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|--|--|----------|---------------------------------------|
| 14 | Angle dekkor, Sine bar, Sine table | 15/04/21 | Lecture interspersed with discussions |
| 15 | Rollers and spheres used to measure angles and Tapers | 17/04/21 | |
| 16 | Taylor's principle | 19/04/21 | |
| 17 | Design of go and no go gauges; plug, ring gagues | 20/04/21 | |
| 18 | Snap, gap, taper gagues | 22/04/21 | |
| 19 | Profile and Position gauges. | 26/04/21 | |
| UNIT-III Optical Measuring Instruments; Interferometry | | | |
| CO3: Principles of measuring instruments | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 20 | Tools maker's microscope and uses | 27/04/21 | Lecture interspersed with discussions |
| 21 | Autocollimators, Optical projector | 29/04/21 | |
| 22 | Optical flats and their uses. | 03/05/21 | |
| 23 | Interference of light, Michaleson's interferometer | 05/05/21 | |
| 24 | NPL flatness interferometer and NPL gauge interferometer. | 07/05/21 | |
| UNIT-IV Surface Roughness Measurement; Comparators | | | |
| CO4: Evaluation and inspection of surface roughness. | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 25 | Differences between surface roughness and surface waviness | 17/05/21 | Lecture interspersed with discussions |
| 26 | Nomenclature of surface roughness | 18/05/21 | |
| 27 | Numerical assessment of surface finish-CLA, Rt., R.M.S. Rz, R10 values | 19/05/21 | |
| 28 | Method of measurement of surface finish – Profilograph, Talysurf | 21/05/21 | |
| 29 | ISI symbols for indication of surface finish. | 25/05/21 | |

| | | | |
|--|--|----------|---------------------------------------|
| 30 | Numerical problems on surface finish | 27/05/21 | |
| 31 | Mechanical comparators | 28/05/21 | |
| 32 | optical comparators | 31/05/21 | |
| 33 | electrical and electronic comparators | 01/06/21 | |
| 34 | Pneumatic comparators and their uses. | 02/06/21 | |
| UNIT-V Gear Measurement; Screw Thread Measurement | | | |
| CO5: Inspection of spur gear and thread elements | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 35 | Nomenclature of gear tooth | 03/06/21 | Lecture interspersed with discussions |
| 36 | tooth thickness measurement with gear tooth vernier & flange micro meter | 04/06/21 | |
| 37 | pitch measurement | 07/06/21 | |
| 38 | total composite error and tooth to tooth composite errors | 08/06/21 | |
| 39 | rolling gear tester, involute profile checking | 10/06/21 | |
| 40 | Screw thread elements of measurement | 12/06/21 | |
| 41 | concept of virtual effective diameter | 14/06/21 | |
| 42 | measurement of effective diameter | 15/06/21 | |
| 43 | angle of thread and thread pitch | 17/06/21 | |
| 44 | Profile thread gauges. | 19/06/21 | |
| UNIT-VI Flatness Measurement; Machine Tool Alignment Tests | | | |
| CO6: Machine tool testing to evaluate machine tool quality. | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 45 | Measurement of flatness of surfaces- instruments used- straight edges | 21/06/21 | |
| 46 | surface plate | 23/06/21 | |

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|----|---|-------------|---------------------------------------|
| 47 | auto collimator. | 24/06/21 | Lecture interspersed with discussions |
| 48 | machine tool alignment testing on lathe machine. | 25/06/21 | |
| 49 | machine tool alignment testing on drilling machine. | 28,29/06/21 | |
| 50 | machine tool alignment testing on milling machine. | 30/06/21 | |

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TENTATIVE LESSON PLAN: R1632031 METROLOGY

| | | |
|--------------------------------|------------------------------------|---------------------------|
| Course Title: Metrology | | |
| Section : Sec II | Date : 22/03/21 | Page No : 01 of 04 |
| Revision No : 00 | Prepared By : V.Pavan Kumar | Approved By : HOD |

Tools: Black board, PPTs

| No. of Periods | TOPIC | Date | Mode of Delivery |
|---|---|----------|---------------------------------------|
| UNIT-I Systems Of Limits And Fits | | | |
| CO1: Design of part, tolerances and fits. | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 1 | Introduction, nominal size, tolerance | 22/3/21 | Lecture interspersed with discussions |
| 2 | Limits, Deviations. | 23/3/21 | |
| 3 | Unilateral and bilateral tolerance system, fits | 24/3/21 | |
| 4 | Hole and Shaft basis systems | 25/3/21 | |
| 5 | Interchangeability, deterministic & statistical tolerancing, selective assembly | 27/3/21 | |
| 6 | International standard system of tolerances. | 30/3/21 | |
| 7 | Selection of limits and tolerances for correct functioning. | 31/3/21 | |
| 8 | Problems on limits and tolerances | 01/04/21 | |
| UNIT-II Linear Measurement; Measurement Of Angles And Tapers; Limit Gauges | | | |
| CO2: Inspection of engineering parts with various precision instruments. | | | |
| TB: Engineering Metrology by R.K.Jain / Khanna Publishers. | | | |
| 9 | Length standards, end standards | 05/04/21 | |
| 10 | Slip gauges- calibration of the slip gauges | 06/04/21 | |
| 11 | Dial indicators | 08/04/21 | |
| 12 | Micrometers | 10/04/21 | |
| 13 | Measurement of angles by bevel protractor, angle slip gauges | 12/04/21 | |

| | | | |
|----|---|----------|---------------------------------------|
| 14 | Angle dekkor, Sine bar, Sine table | 15/04/21 | Lecture interspersed with discussions |
| 15 | Rollers and spheres used to measure angles and Tapers | 17/04/21 | |
| 16 | Taylor's principle | 19/04/21 | |
| 17 | Design of go and no go gauges; plug, ring gagues | 20/04/21 | |
| 18 | Snap, gap, taper gagues | 22/04/21 | |
| 19 | Profile and Position gauges. | 26/04/21 | |

UNIT-III Optical Measuring Instruments; Interferometry

CO3: Principles of measuring instruments

TB: Engineering Metrology by R.K.Jain / Khanna Publishers

| | | | |
|----|---|----------|---------------------------------------|
| 20 | Tools maker's microscope and uses | 27/04/21 | Lecture interspersed with discussions |
| 21 | Autocollimators, Optical projector | 29/04/21 | |
| 22 | Optical flats and their uses. | 03/05/21 | |
| 23 | Interference of light, Michaleson's interferometer | 05/05/21 | |
| 24 | NPL flatness interferometer and NPL gauge interferometer. | 07/05/21 | |

UNIT-IV Surface Roughness Measurement; Comparators

CO4: Evaluation and inspection of surface roughness.

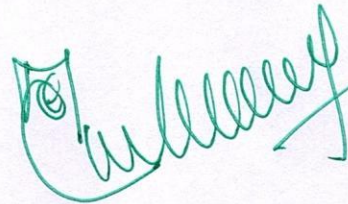
TB: Engineering Metrology by R.K.Jain / Khanna Publishers

| | | | |
|----|--|----------|---------------------------------------|
| 25 | Differences between surface roughness and surface waviness | 17/05/21 | Lecture interspersed with discussions |
| 26 | Nomenclature of surface roughness | 18/05/21 | |
| 27 | Numerical assessment of surface finish-CLA, Rt., R.M.S. Rz, R10 values | 19/05/21 | |
| 28 | Method of measurement of surface finish – Profilograph, Talysurf | 21/05/21 | |
| 29 | ISI symbols for indication of surface finish. | 25/05/21 | |

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|---|--|----------|---------------------------------------|
| 30 | Numerical problems on surface finish | 27/05/21 | |
| 31 | Mechanical comparators | 28/05/21 | |
| 32 | optical comparators | 31/05/21 | |
| 33 | electrical and electronic comparators | 01/06/21 | |
| 34 | Pneumatic comparators and their uses. | 02/06/21 | |
| UNIT-V Gear Measurement; Screw Thread Measurement CO5: Inspection of spur gear and thread elements TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 35 | Nomenclature of gear tooth | 03/06/21 | Lecture interspersed with discussions |
| 36 | tooth thickness measurement with gear tooth vernier & flange micro meter | 04/06/21 | |
| 37 | pitch measurement | 07/06/21 | |
| 38 | total composite error and tooth to tooth composite errors | 08/06/21 | |
| 39 | rolling gear tester, involute profile checking | 10/06/21 | |
| 40 | Screw thread elements of measurement | 12/06/21 | |
| 41 | concept of virtual effective diameter | 14/06/21 | |
| 42 | measurement of effective diameter | 15/06/21 | |
| 43 | angle of thread and thread pitch | 17/06/21 | |
| 44 | Profile thread gauges. | 19/06/21 | |
| UNIT-VI Flatness Measurement; Machine Tool Alignment Tests CO6: Machine tool testing to evaluate machine tool quality. TB: Engineering Metrology by R.K.Jain / Khanna Publishers | | | |
| 45 | Measurement of flatness of surfaces- instruments used- straight edges | 21/06/21 | |
| 46 | surface plate | 23/06/21 | |

| | | | |
|----|---|-------------|---------------------------------------|
| 47 | auto collimator. | 24/06/21 | Lecture interspersed with discussions |
| 48 | machine tool alignment testing on lathe machine. | 25/06/21 | |
| 49 | machine tool alignment testing on drilling machine. | 28,29/06/21 | |
| 50 | machine tool alignment testing on milling machine. | 30/06/21 | |

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TENTATIVE PLAN: R1632032
INSTRUMENTATION & CONTROL SYSTEMS

| | | | |
|--|--|------------------------------|---------------------------------------|
| Course Title: INSTRUMENTATION AND CONTROL SYSTEMS | | Course code: R1632032 | |
| Section: A | | Date: 22-03-2021 | Page No: 01 to 04. |
| Revision No: 01 | Prepared By: Mr. G. Durga Prasad | | Approved By: HOD |
| Tools: Black board, PPTs | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I Basics of instrumentation and Displacement Measurement | | | |
| CO1: At the end of the course student will understand the principles of Measurement which includes the working Mechanisms of various Devices and sensors. | | | |
| TB: 1. Measurement systems: applications & design by D S Kumar | | | |
| 2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson | | | |
| 1 | Introduction to the course | 22-03-2021 | Lecture interspersed with discussions |
| 2 | Basic Definitions and Principles | 23-03-2021 | |
| 3 | Measurement Systems and functional Elements | 25-03-2021 | |
| 4 | Examples of Generalized Measurement System | 26-03-2021 | |
| 5 | Static Performance Characteristics | 27-03-2021 | |
| 6 | Dynamic Performance Characteristics | 30-03-2021 | |
| 7 | Introduction to pressure measurement | 01-04-2021 | |
| 8 | Classification to transducers | 02-04-2021 | |
| 9 | Transducers Continuation | 03-04-2021 | |
| 10 | Transducers Continuation | 05-04-2021 | |
| 11 | Calibration process | 06-04-2021 | |
| 12 | Errors, classification of errors | 08-04-2021 | |
| UNIT-II Measurement of Temperature and Pressure | | | |
| CO2: At the end of this course student will understand the working principles and can select appropriate device for temperature and pressure measurement. | | | |
| TB:1. Measurement systems: applications & design by D S Kumar | | | |
| 2. Mechanical Measurements/ Beckwith, Maragoni, Linehard, Pearson | | | |
| 11 | Introduction to measurement of temperature | 08-04-2021 | Lecture interspersed with discussions |
| 12 | Various Principles of Temperature measurement | 09-04-2021 | |
| 13 | Glass Thermometers, Pressure gauge thermometer, Bimetallic strip thermometer | 10-04-2021 | |
| 14 | Classification based on electrical resistance thermometer | 12-04-2021 | |
| 15 | Electrical resistance thermometer continuation | 15-04-2021 | |
| 16 | Classification Based on radiation thermometer | 16-04-2021 | |
| 17 | Radiation Thermometer continuation | 17-04-2021 | |
| 18 | Sources of errors, precautions in temperature measurement | 19-04-2021 | |
| 19 | Introduction to pressure measurement and units | 20-04-2021 | |

| | | | |
|---|---|------------|---------------------------------------|
| 20 | Classification of pressure measurement | 22-04-2021 | |
| 21 | Simple Manometers, Piezo meters | 22-04-2021 | |
| 22 | U-Tube Manometers | 23-04-2021 | |
| 23 | Differential Manometers | 23-04-2021 | |
| 24 | Bordon Gauge, Diaphragm gauge, | 24-04-2021 | |
| 25 | Bellow Gauges, Vacuum Gauge | 26-04-2021 | |
| 26 | Ionization Gauge, Dead Weight Pressure Gauge | 27-04-2021 | |
| 27 | Errors in pressure gauges, precautions in reading | 29-04-2021 | |
| 28 | Brief Explanation of all the pressure gauges | 29-04-2021 | |
| UNIT-III Miscellaneous Measurement | | | |
| CO3: At the end of this course student will understand the working principles, and can select appropriate device for of various flow, level, speed, Acceleration and vibration measurement. | | | |
| TB:1. Measurement systems: applications & design by D S Kumar | | | |
| 2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson | | | |
| 29 | Introduction to the level Measurement | 30-04-2021 | Lecture interspersed with discussions |
| 30 | Direct Method for Level Measurement | 01-05-2021 | |
| 31 | Indirect Method for Level Measurement | 03-05-2021 | |
| 32 | Flow Measurement | 04-05-2021 | |
| 33 | Flow Measurement and Introduction to Speed Measurement. | 06-05-2021 | |
| 34 | Speed Measurement | 07-05-2021 | |
| 35 | Speed Measurement Continuation | 08-05-2021 | |
| 36 | Measurement of Acceleration | 10-05-2021 | |
| 37 | Measurement of Acceleration | 11-05-2021 | |
| 38 | Measurement of Vibration | 13-05-2021 | |
| 39 | Measurement of Vibration | 15-05-2021 | |
| 40 | Measurement of Force | 17-05-2021 | |
| 41 | Measurement of Force | 18-05-2021 | |

UNIT-IV Strain Measurement

CO4:At the end of this course student will understand the working principles and can select appropriate device of various types of stress and strain measurements.

TB:1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

| | | | |
|----|---|------------|---------------------------------------|
| 42 | Introduction to Stress and Strain, Load Cells | 19-05-2021 | Lecture interspersed with discussions |
| 43 | Strain Gauge Load Cells | 20-05-2021 | |
| 44 | Pneumatic Load Cells | 21-05-2021 | |
| 45 | Measurement of Force | 22-05-2021 | |
| 46 | Load Cells Continuation | 24-05-2021 | |
| 47 | Load Cells Continuation | 25-05-2021 | |
| 48 | Load Cells Continuation | 27-05-2021 | |

UNIT-V Measurement of Power and Torque

CO5:At the end of this course student will understand the operation principles, and can select appropriate device of various humidity, force, torque and power measurement.

TB:1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

| | | | |
|----|----------------------------------|------------|---------------------------------------|
| 49 | Torque Measurement | 28-05-2021 | Lecture interspersed with discussions |
| 50 | Torque Measurement Continuation | 29-05-2021 | |
| 51 | Torque Measurement Continuation | 31-05-2021 | |
| 52 | Torsion Measurement | 01-06-2021 | |
| 53 | Torsion Measurement Continuation | 03-06-2021 | |
| 54 | Torsion Measurement Continuation | 04-06-2021 | |
| 55 | Torsion Measurement Continuation | 05-06-2021 | |
| 56 | Power Measurement | 07-06-2021 | |
| 57 | Power Measurement Continuation | 08-06-2021 | |
| 58 | Dynamometers | 10-06-2021 | |
| 59 | Dynamometers Continuation | 11-06-2021 | |
| 60 | Dynamometers Continuation | 12-06-2021 | |


UNIT-VI Control Systems

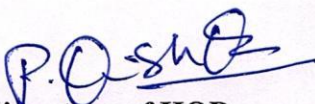
CO6: At the end of this course student will understand the concept and can select appropriate control Systems.

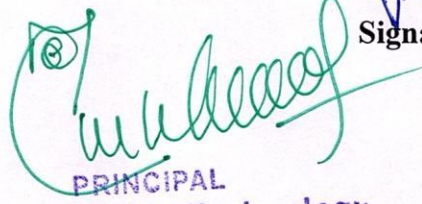
TB:1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

| | | | |
|----|--|------------|---------------------------------------|
| 61 | Introduction to Control Systems & Definition | 14-06-2021 | Lecture interspersed with discussions |
| 62 | Elements of Control Systems | 15-06-2021 | |
| 63 | Open loop control Systems | 17-06-2021 | |
| 64 | Open loop Control System examples | 18-06-2021 | |
| 65 | Closed loop Control System & examples | 19-06-2021 | |
| 66 | Servo mechanism | 21-06-2021 | |
| 67 | Block Diagrams | 22-06-2021 | |
| 68 | Block Diagram | 24-06-2021 | |
| 69 | Revision | 25-06-2021 | |


Signature of Faculty


Signature of HOD


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SRK Institute of Technology
ENIKEPADU, VIJAYAWADA-521 108

TENTATIVE PLAN: R1632032
INSTRUMENTATION & CONTROL SYSTEMS

| | | | |
|--|--|------------------------------|---------------------------------------|
| Course Title: INSTRUMENTATION AND CONTROL SYSTEMS | | Course code: R1632032 | |
| Section: B | | Date: 22-03-2021 | Page No: 01 to 04. |
| Revision No: 02 | Prepared By: Mr. G. Durga Prasad | | Approved By: HOD |
| Tools: Black board, PPTs | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I Basics of instrumentation and Displacement Measurement | | | |
| CO1: At the end of the course student will understand the principles of Measurement which includes the working Mechanisms of various Devices and sensors. | | | |
| TB: 1. Measurement systems: applications & design by D S Kumar 2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson | | | |
| 1 | Introduction to the course | 22-03-2021 | Lecture interspersed with discussions |
| 2 | Basic Definitions and Principles | 23-03-2021 | |
| 3 | Measurement Systems and functional Elements | 24-03-2021 | |
| 4 | Examples of Generalized Measurement System | 25-03-2021 | |
| 5 | Static Performance Characteristics | 26-03-2021 | |
| 6 | Dynamic Performance Characteristics | 27-03-2021 | |
| 7 | Introduction to pressure measurement | 30-03-2021 | |
| 8 | Classification to transducers | 31-03-2021 | |
| 9 | Transducers Continuation | 02-04-2021 | |
| 10 | Transducers Continuation | 03-04-2021 | |
| 11 | Calibration process | 05-04-2021 | |
| 12 | Errors, classification of errors | 06-04-2021 | |
| UNIT-II Measurement of Temperature and Pressure | | | |
| CO2: At the end of this course student will understand the working principles and can select appropriate device for temperature and pressure measurement. | | | |
| TB: 1. Measurement systems: applications & design by D S Kumar 2. Mechanical Measurements/ Beckwith, Maragoni, Linehard, Pearson | | | |
| 11 | Introduction to measurement of temperature | 07-04-2021 | Lecture interspersed with discussions |
| 12 | Various Principles of Temperature measurement | 08-04-2021 | |
| 13 | Glass Thermometers, Pressure gauge thermometer, Bimetallic strip thermometer | 09-04-2021 | |
| 14 | Classification based on electrical resistance thermometer | 10-04-2021 | |
| 15 | Electrical resistance thermometer continuation | 12-04-2021 | |
| 16 | Classification Based on radiation thermometer | 12-04-2021 | |
| 17 | Radiation Thermometer continuation | 13-04-2021 | |
| 18 | Sources of errors, precautions in temperature measurement | 14-04-2021 | |
| 19 | Introduction to pressure measurement and units | 15-04-2021 | |

| | | | |
|---|---|------------|---------------------------------------|
| 20 | Classification of pressure measurement | 16-04-2021 | |
| 21 | Simple Manometers, Piezo meters | 19-04-2021 | |
| 22 | U-Tube Manometers | 20-04-2021 | |
| 23 | Differential Manometers | 22-04-2021 | |
| 24 | Bordon Gauge, Diaphragm gauge, | 23-04-2021 | |
| 25 | Bellow Gauges, Vacuum Gauge | 24-04-2021 | |
| 26 | Ionization Gauge, Dead Weight Pressure Gauge | 26-04-2021 | |
| 27 | Errors in pressure gauges, precautions in reading | 27-04-2021 | |
| 28 | Brief Explanation of all the pressure gauges | 28-04-2021 | |
| UNIT-III Miscellaneous Measurement CO3: At the end of this course student will understand the working principles, and can select appropriate device for of various flow, level, speed, Acceleration and vibration measurement. TB: 1. Measurement systems: applications & design by D S Kumar 2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson | | | |
| 29 | Introduction to the level Measurement | 29-04-2021 | Lecture interspersed with discussions |
| 30 | Direct Method for Level Measurement | 30-04-2021 | |
| 31 | Indirect Method for Level Measurement | 01-05-2021 | |
| 32 | Flow Measurement | 05-05-2021 | |
| 33 | Flow Measurement and Introduction to Speed Measurement. | 06-05-2021 | |
| 34 | Speed Measurement | 07-05-2021 | |
| 35 | Speed Measurement Continuation | 08-05-2021 | |
| 36 | Measurement of Acceleration | 10-05-2021 | |
| 37 | Measurement of Acceleration | 11-05-2021 | |
| 38 | Measurement of Vibration | 12-05-2021 | |
| 39 | Measurement of Vibration | 13-05-2021 | |
| 40 | Measurement of Force | 15-05-2021 | |
| 41 | Measurement of Force | 17-05-2021 | |

UNIT-IV Strain Measurement

CO4:At the end of this course student will understand the working principles and can select appropriate device of various types of stress and strain measurements.

TB:1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

| | | | |
|----|---|------------|---------------------------------------|
| 42 | Introduction to Stress and Strain, Load Cells | 19-05-2021 | Lecture interspersed with discussions |
| 43 | Strain Gauge Load Cells | 20-05-2021 | |
| 44 | Pneumatic Load Cells | 21-05-2021 | |
| 45 | Measurement of Force | 22-05-2021 | |
| 46 | Load Cells Continuation | 24-05-2021 | |
| 47 | Load Cells Continuation | 25-05-2021 | |
| 48 | Load Cells Continuation | 28-05-2021 | |

UNIT-V Measurement of Power and Torque

CO5:At the end of this course student will understand the operation principles, and can select appropriate device of various humidity, force, torque and power measurement.

TB:1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

| | | | |
|----|----------------------------------|------------|---------------------------------------|
| 49 | Torque Measurement | 29-05-2021 | Lecture interspersed with discussions |
| 50 | Torque Measurement Continuation | 21-05-2021 | |
| 51 | Torque Measurement Continuation | 01-06-2021 | |
| 52 | Torsion Measurement | 02-06-2021 | |
| 53 | Torsion Measurement Continuation | 03-06-2021 | |
| 54 | Torsion Measurement Continuation | 04-06-2021 | |
| 55 | Torsion Measurement Continuation | 05-06-2021 | |
| 56 | Power Measurement | 07-06-2021 | |
| 57 | Power Measurement Continuation | 08-06-2021 | |
| 58 | Dynamometers | 09-06-2021 | |
| 59 | Dynamometers Continuation | 10-06-2021 | |
| 60 | Dynamometers Continuation | 11-06-2021 | |

UNIT-VI Control Systems

CO6:At the end of this course student will understand the concept and can select appropriate control Systems.

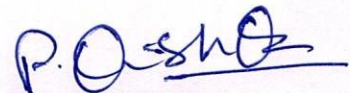
TB:1. Measurement systems: applications & design by D S Kumar

2. Mechanical Measurements/ BeckWith, Maragoni, Linehard, Pearson

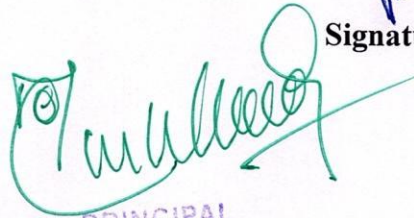
| | | | |
|----|--|------------|---------------------------------------|
| 61 | Introduction to Control Systems & Definition | 14-06-2021 | Lecture interspersed with discussions |
| 62 | Elements of Control Systems | 15-06-2021 | |
| 63 | Open loop control Systems | 16-06-2021 | |
| 64 | Open loop Control System examples | 17-06-2021 | |
| 65 | Closed loop Control System & examples | 18-06-2021 | |
| 66 | Servo mechanism | 19-06-2021 | |
| 67 | Closed loop Control System & examples | 21-06-2021 | |
| 68 | Block Diagram | 22-06-2021 | |
| 69 | Servo mechanism | 23-06-2021 | |
| 70 | Block Diagram | 24-06-2021 | |
| 71 | Revision | 25-06-2021 | |
| 72 | Revision | 26-06-2021 | |



Signature of Faculty



Signature of HOD



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ENIKEPADU, VIJAYAWADA-521 108

TENTATIVE PLAN: R1632033

| | | | |
|--|---|------------------------------|-----------------------------------|
| Course Title: REFRIGERATION AND AIRCONDITIONING | | Course code: R1632033 | |
| Section : Sec I | Date : 22-03-2021 | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By : B NAGENDRA | Approved By : HOD | |
| Tools: ONLINE GOOGLE MEET | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION TO REFRIGERATION SYSTEM | | | |
| CO1: Become familiar with a basic concept refrigeration | | | |
| TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI. | | | |
| | UNIT - 1 INTRODUCTION TO REFRIGERATION SYSTEM | | ONLINE GOOGLE MEET |
| 1 | Necessity and applications | 22-03-21 | |
| 2 | Necessity and applications | 23-03-21 | |
| 3 | Necessity and applications | 24-03-21 | |
| 4 | Fourier rate equation | 25-03-21 | |
| 5 | Unit of refrigeration and C.O.P. | 25-03-21 | |
| 6 | Unit of refrigeration and C.O.P. | 27-03-21 | |
| 7 | Cop-Mechanical refrigeration | 30-03-21 | |
| 8 | Cop-Mechanical refrigeration | 31-03-21 | |
| 9 | Types of ideal cycles of refrigeration | 01-04-21 | |
| 10 | Types of ideal cycles of refrigeration | 01-04-21 | |
| 11 | Air refrigeretor with reverse Carnot cycle | 03-04-21 | |
| 12 | Air refrigeration: bell Coleman cycle | 05-04-21 | |
| 13 | Air refrigeration: bell Coleman cycle | 06-04-21 | |
| 14 | open and dense air systems | 07-04-21 | |
| 15 | Refrigeration systems used in air crafts and problems. | 08-04-21 | |
| 16 | Refrigeration systems used in air crafts and problems. | 08-04-21 | |
| UNIT-II VAPOUR COMPRESSION REFRIGERATION SYSTEM | | | |
| CO2: Gain knowledge about VCR System | | | |
| TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI. | | | |
| | UNIT - 2 VAPOUR COMPRESSION REFRIGERATION SYSTEM | | ONLINE GOOGLE MEET |
| 17 | Working principle of VCR System | 08-04-21 | |
| 18 | Essential components of the plant | 10-04-21 | |
| 19 | Essential components of the plant | 12-04-21 | |
| 20 | Simple vapour compression refrigeration cycle | 15-04-21 | |
| 21 | COP –representation of cycle on T-S and p-h charts | 15-04-21 | |
| 22 | COP –representation of cycle on T-S and p-h charts | 17-04-21 | |
| 23 | COP –representation of cycle on T-S and p-h charts | 17-04-21 | |
| 24 | COP –representation of cycle on T-S and p-h charts of all VCR systems | 19-04-21 | |
| 25 | Cycle analysis – actual cycle influence of various parameters on system performance – use of p-h charts | 19-04-21 | |
| 26 | Problems | 20-04-21 | |

| | | | |
|--|--|----------|--------------------------|
| 27 | Problems | 20-04-21 | |
| 28 | Problems | 20-04-21 | |
| UNIT-III REFRIGERANTS AND COMPONENTS OF VCR SYSTEM | | | |
| CO3: Become familiar with the concepts of refrigerants and components of VCR system | | | |
| TB:“ REFRIGERATION AND AIRCONDITIONING”, R.S.KHURMI. | | | |
| | UNIT – 3 REFRIGERANTS AND COMPONENTS OF VCR SYSTEM | | ONLINE GOOGLE MEET |
| 29 | Refrigerants introduction Desirable properties | 22-04-21 | |
| 30 | Refrigerants introduction Desirable properties | 22-04-21 | |
| 31 | Classification - refrigerants used | 24-04-21 | |
| 32 | Nomenclature – ozone depletion – global warming | 26-04-21 | |
| 33 | Nomenclature,problems | 27-04-21 | |
| 34 | Compressors – general classification | 28-04-21 | |
| 35 | Comparison – advantages and disadvantages | 29-04-21 | |
| 36 | Condensers – classification – working principles evaporators | 29-04-21 | |
| 37 | Evaporators,problems | 01-05-21 | |
| 38 | Evaporators,problems | 03-05-21 | |
| UNIT-IV VAPOUR ABSORPTION REFRIGERATION SYSTEM | | | |
| CO4: Gain knowledge about concept of vapour absorption refrigeration system | | | |
| TB:“ REFRIGERATION AND AIRCONDITIONING”, R.S.KHURMI. | | | |
| | UNIT – 4 VAPOUR ABSORPTION REFRIGERATION SYSTEM | | ONLINE GOOGLE MEET |
| 39 | Calculation of maximum COP | 13-05-21 | |
| 40 | Calculation of maximum COP | 13-05-21 | |
| 41 | Description and working of NH ₃ – water system | 15-05-21 | |
| 42 | Description and working of NH ₃ – water system | 17-05-21 | |
| 43 | Li Br –water (Two shell & Four shell) System | 18-05-21 | |
| 44 | Li Br –water (Two shell & Four shell) System | 19-05-21 | |
| 45 | Principle of operation three fluid absorption system, salient features | 20-05-21 | |
| 46 | Principle of operation three fluid absorption system, salient features | 20-05-21 | |
| 47 | STEAM JET REFRIGERATION SYSTEM | 22-05-21 | |
| 48 | STEAM JET REFRIGERATION SYSTEM | 24-05-21 | |
| 49 | Working Principle and basic components. principle | 25-05-21 | |
| 50 | Operation of (i) thermo electric refrigerator (ii) vortex tube | 26-05-21 | |
| 51 | Operation of (i) thermo electric refrigerator (ii) vortex tube | 27-05-21 | |
| UNIT-V INTRODUCTION TO AIR CONDITIONING SYSTEM | | | |
| CO5: Become familiar with Air conditioning system | | | |
| TB:“ REFRIGERATION AND AIRCONDITIONING”, R.S.KHURMI. | | | |
| | UNIT – 5 INTRODUCTION TO AIR CONDITIONING SYSTEM | | ONLINE GOOGLE MEET |
| 52 | Psychometric properties & processes | 13-05-21 | |
| 53 | Characterization of sensible and latent heat loads | 13-05-21 | |
| 54 | Need for ventilation, consideration of infiltration | 15-05-21 | |
| 55 | Load concepts of RSHF, GSHF- problems | 17-05-21 | |
| 56 | Concept of ESHF and ADP temperature | 18-05-21 | |
| 57 | Requirements of human comfort and concept of effective temperature | 19-05-21 | |
| 58 | comfort chart –comfort air conditioning | 20-05-21 | |
| 59 | requirements of industrial air conditioning, air | 20-05-21 | |

| | | | |
|---|---|----------|-----------------------------------|
| | conditioning load calculations. | | |
| 60 | Problems | 22-05-21 | |
| 61 | Problems | 24-05-21 | |
| UNIT-VI AIR CONDITIONING SYSTEM CO6: Become familiar with concepts of Air conditioning system TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI. | | | |
| | UNIT – 6 AIR CONDITIONING SYSTEM | | ONLINE GOOGLE MEET |
| 62 | Classification of equipment | 10-06-21 | |
| 63 | Classification of equipment | 10-06-21 | |
| 64 | Cooling, heating humidification | 12-06-21 | |
| 65 | Dehumidification, filters, grills | 14-06-21 | |
| 66 | Dehumidification, filters, grills | 15-06-21 | |
| 67 | Dehumidification, filters, grills | 16-06-21 | |
| 68 | Registers, fans and blowers | 17-06-21 | |
| 69 | Registers, fans and blowers | 17-06-21 | |
| 70 | Heat pump – heat sources | 19-06-21 | |
| 71 | Different heat pump circuits. | 21-06-21 | |
| 72 | Revision | 22-06-21 | |

B. Nagendra
Signature of Faculty

P. Asha
Signature of HOD

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PRINCIPAL
SRK Institute of Technology
ENIKEPADU, VIJAYAWADA-521 108

TENTATIVE PLAN: R1632033

| | | | |
|--|---|------------------------------|-----------------------------------|
| Course Title: REFRIGERATION AND AIRCONDITIONING | | Course code: R1632033 | |
| Section : Sec II | Date : 22-03-2021 | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By : B NAGENDRA | Approved By : HOD | |
| Tools: ONLINE GOOGLE MEET | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION TO REFRIGERATION SYSTEM | | | |
| CO1: Become familiar with a basic concept refrigeration | | | |
| TB: "REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI. | | | |
| | UNIT - 1 INTRODUCTION TO REFRIGERATION SYSTEM | | ONLINE GOOGLE MEET |
| 1 | Necessity and applications | 22-03-21 | |
| 2 | Necessity and applications | 23-03-21 | |
| 3 | Necessity and applications | 24-03-21 | |
| 4 | Fourier rate equation | 25-03-21 | |
| 5 | Unit of refrigeration and C.O.P. | 25-03-21 | |
| 6 | Unit of refrigeration and C.O.P. | 27-03-21 | |
| 7 | Cop-Mechanical refrigeration | 30-03-21 | |
| 8 | Cop-Mechanical refrigeration | 31-03-21 | |
| 9 | Types of ideal cycles of refrigeration | 01-04-21 | |
| 10 | Types of ideal cycles of refrigeration | 01-04-21 | |
| 11 | Air refrigerer with reverse Carnot cycle | 03-04-21 | |
| 12 | Air refrigeration: bell Coleman cycle | 05-04-21 | |
| 13 | Air refrigeration: bell Coleman cycle | 06-04-21 | |
| 14 | open and dense air systems | 07-04-21 | |
| 15 | Refrigeration systems used in air crafts and problems. | 08-04-21 | |
| 16 | Refrigeration systems used in air crafts and problems. | 08-04-21 | |
| UNIT-II VAPOUR COMPRESSION REFRIGERATION SYSTEM | | | |
| CO2: Gain knowledge about VCR System | | | |
| TB:" REFRIGERATION AND AIRCONDITIONING", R.S.KHURMI. | | | |
| | UNIT - 2 VAPOUR COMPRESSION REFRIGERATION SYSTEM | | ONLINE GOOGLE MEET |
| 17 | Working principle of VCR System | 08-04-21 | |
| 18 | Essential components of the plant | 10-04-21 | |
| 19 | Essential components of the plant | 12-04-21 | |
| 20 | Simple vapour compression refrigeration cycle | 15-04-21 | |
| 21 | COP –representation of cycle on T-S and p-h charts | 15-04-21 | |
| 22 | COP –representation of cycle on T-S and p-h charts | 17-04-21 | |
| 23 | COP –representation of cycle on T-S and p-h charts | 17-04-21 | |
| 24 | COP –representation of cycle on T-S and p-h charts of all VCR systems | 19-04-21 | |
| 25 | Cycle analysis – actual cycle influence of various parameters on system performance – use of p-h charts | 19-04-21 | |
| 26 | Problems | 20-04-21 | |

| | | | |
|--|--|----------|--------------------------|
| 27 | Problems | 20-04-21 | |
| 28 | Problems | 20-04-21 | |
| UNIT-III REFRIGERANTS AND COMPONENTS OF VCR SYSTEM | | | |
| CO3: Become familiar with the concepts of refrigerants and components of VCR system | | | |
| TB:“ REFRIGERATION AND AIRCONDITIONING”, R.S.KHURMI. | | | |
| | UNIT – 3 REFRIGERANTS AND COMPONENTS OF VCR SYSTEM | | ONLINE GOOGLE MEET |
| 29 | Refrigerants introduction Desirable properties | 22-04-21 | |
| 30 | Refrigerants introduction Desirable properties | 22-04-21 | |
| 31 | Classification - refrigerants used | 24-04-21 | |
| 32 | Nomenclature – ozone depletion – global warming | 26-04-21 | |
| 33 | Nomenclature,problems | 27-04-21 | |
| 34 | Compressors – general classification | 28-04-21 | |
| 35 | Comparison – advantages and disadvantages | 29-04-21 | |
| 36 | Condensers – classification – working principles evaporators | 29-04-21 | |
| 37 | Evaporators,problems | 01-05-21 | |
| 38 | Evaporators,problems | 03-05-21 | |
| UNIT-IV VAPOUR ABSORPTION REFRIGERATION SYSTEM | | | |
| CO4: Gain knowledge about concept of vapour absorption refrigeration system | | | |
| TB:“ REFRIGERATION AND AIRCONDITIONING”, R.S.KHURMI. | | | |
| | UNIT – 4 VAPOUR ABSORPTION REFRIGERATION SYSTEM | | ONLINE GOOGLE MEET |
| 39 | Calculation of maximum COP | 13-05-21 | |
| 40 | Calculation of maximum COP | 13-05-21 | |
| 41 | Description and working of NH ₃ – water system | 15-05-21 | |
| 42 | Description and working of NH ₃ – water system | 17-05-21 | |
| 43 | Li Br –water (Two shell & Four shell) System | 18-05-21 | |
| 44 | Li Br –water (Two shell & Four shell) System | 19-05-21 | |
| 45 | Principle of operation three fluid absorption system, salient features | 20-05-21 | |
| 46 | Principle of operation three fluid absorption system, salient features | 20-05-21 | |
| 47 | STEAM JET REFRIGERATION SYSTEM | 22-05-21 | |
| 48 | STEAM JET REFRIGERATION SYSTEM | 24-05-21 | |
| 49 | Working Principle and basic components. principle | 25-05-21 | |
| 50 | Operation of (i) thermo electric refrigerator (ii) vortex tube | 26-05-21 | |
| 51 | Operation of (i) thermo electric refrigerator (ii) vortex tube | 27-05-21 | |
| UNIT-V INTRODUCTION TO AIR CONDITIONING SYSTEM | | | |
| CO5: Become familiar with Air conditioning system | | | |
| TB:“ REFRIGERATION AND AIRCONDITIONING”, R.S.KHURMI. | | | |
| | UNIT – 5 INTRODUCTION TO AIR CONDITIONING SYSTEM | | ONLINE GOOGLE MEET |
| 52 | Psychometric properties & processes | 13-05-21 | |
| 53 | Characterization of sensible and latent heat loads | 13-05-21 | |
| 54 | Need for ventilation, consideration of infiltration | 15-05-21 | |
| 55 | Load concepts of RSHF, GSHF- problems | 17-05-21 | |
| 56 | Concept of ESHF and ADP temperature | 18-05-21 | |
| 57 | Requirements of human comfort and concept of | 19-05-21 | |

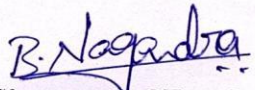
| | | |
|----|--|----------|
| | effective temperature | |
| 58 | comfort chart –comfort air conditioning | 20-05-21 |
| 59 | requirements of industrial air conditioning, air conditioning load calculations. | 20-05-21 |
| 60 | Problems | 22-05-21 |
| 61 | Problems | 24-05-21 |

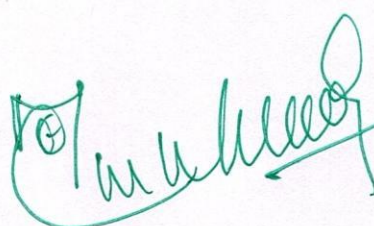
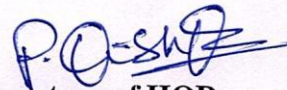
UNIT-VI AIR CONDITIONING SYSTEM

CO6: Become familiar with concepts of Air conditioning system

TB: “REFRIGERATION AND AIRCONDITIONING”, R.S.KHURMI.

| UNIT – 6 AIR CONDITIONING SYSTEM | | | ONLINE GOOGLE MEET |
|----------------------------------|-----------------------------------|----------|--------------------------|
| 62 | Classification of equipment | 10-06-21 | |
| 63 | Classification of equipment | 10-06-21 | |
| 64 | Cooling, heating humidification | 12-06-21 | |
| 65 | Dehumidification, filters, grills | 14-06-21 | |
| 66 | Dehumidification, filters, grills | 15-06-21 | |
| 68 | Dehumidification, filters, grills | 16-06-21 | |
| 69 | Registers, fans and blowers | 17-06-21 | |
| 70 | Registers, fans and blowers | 17-06-21 | |
| 71 | Heat pump – heat sources | 19-06-21 | |
| 72 | Different heat pump circuits. | 21-06-21 | |
| 73 | Revision | 22-06-21 | |


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TENTATIVE PLAN: R1632034 HEAT TRANSFER


| | | | |
|---|---|------------------------------|---------------------------------------|
| Course Title: HEAT TRANSFER | | Course code: R1632034 | |
| Section : Sec A | Date : 22-03-2021 | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By : Y.DURGA BHAVANI | Approved By : HOD | |
| Tools: BLACK BOARD | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION TO HEAT TRANSFER CO1: Become familiar with a basic concepts of modes of heat transfer TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 1 Introduction | | Lecture interspersed with discussions |
| 1 | Modes and mechanisms of heat transfer | 22-03-21 | |
| 2 | basic laws of heat transfer | 23-03-21 | |
| 3 | General discussion about applications of heat transfer | 24-03-21 | |
| 4 | CONDUCTION HEAT TRANSFER | 25-03-21 | |
| 5 | Fourier rate equation | 25-03-21 | |
| 6 | general heat conduction equation in cartesian coordinates | 27-03-21 | |
| 7 | general heat conduction equation in cylindrical coordinates | 30-03-21 | |
| 8 | general heat conduction equation in Spherical coordinates | 31-03-21 | |
| 9 | initial and boundary conditions | 01-04-21 | |
| 10 | Homogeneous slabs, hollow cylinders and spheres | 01-04-21 | |
| 11 | overall heat transfer coefficient – electrical analogy | 03-04-21 | |
| 12 | critical radius of insulation Variable thermal conductivity | 05-04-21 | |
| 13 | systems with heat sources or heat generation | 06-04-21 | |
| 14 | Problem | 07-04-21 | |
| 15 | Problem | 08-04-21 | |
| UNIT-II Extended surface CO2: Gain knowledge about extended surface TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 2 Extended surface (fins) heat Transfer | | Lecture interspersed with discussions |
| 16 | Extended surface (fins) heat Transfer | 08-04-21 | |
| 17 | long fin, fin with insulated tip and short fin | 10-04-21 | |
| 18 | ONE DIMENSIONAL TRANSIENT CONDUCTION HEAT TRANSFER | 12-04-21 | |
| 19 | Systems with negligible internal resistance | 15-04-21 | |
| 20 | significance of biot and fourier numbers | 15-04-21 | |
| 21 | chart solutions of transient conduction systems | 17-04-21 | |
| 22 | Problems | 19-04-21 | |
| 23 | Problems | 20-04-21 | |
| UNIT-III CONVECTIVE HEAT TRANSFER CO3: Become familiar with the concepts of convective heat transfer TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |

| UNIT – 3 CONVECTIVE HEAT TRANSFER | | | | |
|---|---|----------|---------------------------------------|--|
| 24 | Classification of convective heat transfer | 22-04-21 | Lecture interspersed with discussions | |
| 25 | dimensional analysis as a tool for experimental investigation | 22-04-21 | | |
| 26 | Buckingham Pi Theorem for forced and free convection | 24-04-21 | | |
| 27 | empirical non- dimensional correlation for convective heat transfer | 26-04-21 | | |
| 28 | Significance of non-dimensional numbers | 27-04-21 | | |
| 29 | concepts of continuity | 28-04-21 | | |
| 30 | momentum and Energy Equations | 29-04-21 | | |
| 31 | problems | 29-04-21 | | |
| 32 | problems | 01-05-21 | | |
| 33 | Separation of boundary layer | 03-05-21 | | |
| 34 | Stream line body | 04-05-21 | | |
| 34 | problems | 05-05-21 | | |
| 35 | problems | 06-05-21 | | |
| UNIT-IV FORCED CONVECTION | | | | |
| CO4: Gain knowledge about concept of hydrodynamic boundary layers on a vertical plates and pipes | | | | |
| TB:“ HEAT AND MASS TRANSFER”, Er R.K.RAJPUT. | | | | |
| UNIT – 4 FORCED CONVECTION | | | | |
| 36 | Concepts about hydrodynamic and thermal Mechanical Engineering | 13-05-21 | Lecture interspersed with discussions | |
| 37 | Concepts about hydrodynamic and thermal Mechanical Engineering | 13-05-21 | | |
| 38 | boundary layer and use of empirical correlations for convective heat transfer | 15-05-21 | | |
| 39 | flat plates and cylinders | 17-05-21 | | |
| 40 | INTERNAL FLOWS | 18-05-21 | | |
| 41 | Concepts about hydrodynamic and thermal entry lengths | 19-05-21 | | |
| 42 | division of internal flow based on this | 20-05-21 | | |
| 43 | use of empirical relations for horizontal pipe flow | 20-05-21 | | |
| 44 | annulus flow | 22-05-21 | | |
| 45 | FREE CONVECTION | 24-05-21 | | |
| 46 | Development of hydrodynamic and thermal boundary layer along a vertical plate | 25-05-21 | | |
| 47 | use of empirical relations for vertical plates and pipes | 26-05-21 | | |
| 48 | problems | 27-05-21 | | |
| 49 | problems | 27-05-21 | | |
| UNIT-V HEAT TRANSFER WITH PHASE CHANGE BOILING | | | | |
| CO5: Become familiar with heat transfer with phase change boiling | | | | |
| TB:“ HEAT AND MASS TRANSFER”, Er R.K.RAJPUT. | | | | |
| UNIT – 5 HEAT TRANSFER WITH PHASE CHANGE BOILING | | | | |
| 50 | Pool boiling – regimes- calculations on nucleate boiling | 29-05-21 | Lecture interspersed with discussions | |
| 51 | CONDENSATION: Film wise and drop wise condensation | 31-05-21 | | |
| 52 | nusselt’s theory of condensation on a vertical plate | 01-06-21 | | |
| 53 | film condensation on vertical and horizontal cylinders using empirical correlations | 02-06-21 | | |
| 54 | HEAT EXCHANGERS | 03-06-21 | | |

| | | | |
|---|---|----------|---------------------------------------|
| 55 | Classification of heat exchangers | 03-06-21 | |
| 56 | overall heat transfer coefficient and fouling factor | 05-06-21 | |
| 57 | concepts of LMTD and NTU methods | 07-06-21 | |
| 58 | Problems | 08-06-21 | |
| 59 | Problems | 09-06-21 | |
| UNIT-VI WORK – RADIATION HEAT TRANSFER | | | |
| CO6: Become familiar with concepts of emission characteristics, heat exchange between grey bodies. | | | |
| TB: “HEAT AND MASS TRANSFER”, Er R.K.RAJPUT. | | | |
| | UNIT – 6 RADIATION HEAT TRANSFER | | |
| 60 | Emission characteristics and laws of black-body radiation | 10-06-21 | Lecture interspersed with discussions |
| 61 | Irradiation | 10-06-21 | |
| 62 | total and monochromatic quantities | 12-06-21 | |
| 63 | laws of Planck, Wien, Kirchoff | 14-06-21 | |
| 64 | Lamber, Stefan and Boltzmann | 15-06-21 | |
| 65 | heat exchange between two black bodies | 16-06-21 | |
| 66 | concepts of shape factor | 17-06-21 | |
| 67 | Emissivity – heat exchange between grey bodies | 17-06-21 | |
| 68 | radiation shields | 19-06-21 | |
| 69 | electrical analogy for radiation networks | 21-06-21 | |
| 70 | Problems | 22-06-21 | |
| 71 | Problems | 23-06-21 | |
| 72 | Problems | 24-06-21 | |
| 73 | Problems | 26-06-21 | |

TB:“ HEAT AND MASS TRANSFER”, Er R.K.RAJPUT.


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TENTATIVE PLAN: R1632034
HEAT TRANSFER

| | | | |
|---|---|------------------------------|---------------------------------------|
| Course Title: HEAT TRANSFER | | Course code: R1632034 | |
| Section : Sec B | Date : 22-03-2021 | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By : Y.DURGA BHAVANI | Approved By : HOD | |
| Tools: BLACK BOARD | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION TO HEAT TRANSFER | | | |
| CO1: Become familiar with a basic concepts of modes of heat transfer | | | |
| TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 1 Introduction | | Lecture interspersed with discussions |
| 1 | Modes and mechanisms of heat transfer | 22-03-21 | |
| 2 | basic laws of heat transfer | 24-03-21 | |
| 3 | General discussion about applications of heat transfer | 24-03-21 | |
| 4 | CONDUCTION HEAT TRANSFER | 25-03-21 | |
| 5 | Fourier rate equation | 26-03-21 | |
| 6 | general heat conduction equation in cartesian coordinates | 27-03-21 | |
| 7 | general heat conduction equation in cylindrical coordinates | 31-03-21 | |
| 8 | general heat conduction equation in Spherical coordinates | 31-03-21 | |
| 9 | initial and boundary conditions | 01-04-21 | |
| 10 | Homogeneous slabs, hollow cylinders and spheres | 02-04-21 | |
| 11 | overall heat transfer coefficient – electrical analogy | 03-04-21 | |
| 12 | critical radius of insulation Variable thermal conductivity | 05-04-21 | |
| 13 | systems with heat sources or heat generation | 07-04-21 | |
| 14 | Problem | 07-04-21 | |
| 15 | Problem | 08-04-21 | |
| UNIT-II Extended surface | | | |
| CO2: Gain knowledge about extended surface | | | |
| TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 2 Extended surface (fins) heat Transfer | | Lecture interspersed with discussions |
| 16 | Extended surface (fins) heat Transfer | 09-04-21 | |
| 17 | long fin, fin with insulated tip and short fin | 10-04-21 | |

| | | | |
|---|---|----------|---------------------------------------|
| 18 | ONE DIMENSIONAL TRANSIENT CONDUCTION HEAT TRANSFER | 12-04-21 | |
| 19 | Systems with negligible internal resistance | 15-04-21 | |
| 20 | significance of biot and fourier numbers | 16-04-21 | |
| 21 | chart solutions of transient conduction systems | 17-04-21 | |
| 22 | Problems | 19-04-21 | |
| 23 | Problems | 22-04-21 | |
| UNIT-III CONVECTIVE HEAT TRANSFER | | | |
| CO3: Become familiar with the concepts of convective heat transfer | | | |
| TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 3 CONVECTIVE HEAT TRANSFER | | |
| 24 | Classification of convective heat transfer | 22-04-21 | Lecture interspersed with discussions |
| 25 | dimensional analysis as a tool for experimental investigation | 23-04-21 | |
| 26 | Buckingham Pi Theorem for forced and free convection | 24-04-21 | |
| 27 | empirical non- dimensional correlation for convective heat transfer | 26-04-21 | |
| 28 | Significance of non-dimensional numbers | 28-04-21 | |
| 29 | concepts of continuity | 28-04-21 | |
| 30 | momentum and Energy Equations | 29-04-21 | |
| 31 | problems | 30-04-21 | |
| 32 | problems | 01-05-21 | |
| 33 | Separation of boundary layer | 03-05-21 | |
| 34 | Stream line body | 05-05-21 | |
| 34 | problems | 05-05-21 | |
| 35 | problems | 06-05-21 | |
| UNIT-IV FORCED CONVECTION | | | |
| CO4: Gain knowledge about concept of hydrodynamic boundary layers on a vertical plates and pipes | | | |
| TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 4 FORCED CONVECTION | | |
| 36 | Concepts about hydrodynamic and thermal Mechanical Engineering | 13-05-21 | Lecture interspersed with discussions |
| 37 | Concepts about hydrodynamic and thermal Mechanical Engineering | 15-05-21 | |
| 38 | boundary layer and use of empirical correlations for convective heat transfer | 17-05-21 | |
| 39 | flat plates and cylinders | 19-05-21 | |
| 40 | INTERNAL FLOWS | 19-05-21 | |
| 41 | Concepts about hydrodynamic and thermal entry lengths | 20-05-21 | |
| 42 | division of internal flow based on this | 21-05-21 | |
| 43 | use of empirical relations for horizontal pipe flow | 22-05-21 | |
| 44 | annulus flow | 24-05-21 | |

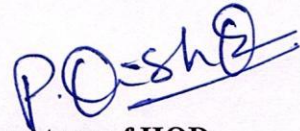
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| 45 | FREE CONVECTION | 26-05-21 | |
| 46 | Development of hydrodynamic and thermal boundary layer along a vertical plate | 26-05-21 | |
| 47 | use of empirical relations for vertical plates and pipes | 27-05-21 | |
| 48 | problems | 28-05-21 | |
| 49 | problems | 29-05-21 | |
| UNIT-V HEAT TRANSFER WITH PHASE CHANGE BOILING | | | |
| CO5: Become familiar with heat transfer with phase change boiling | | | |
| TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 5 HEAT TRANSFER WITH PHASE CHANGE BOILING | | |
| 50 | Pool boiling – regimes- calculations on nucleate boiling | 31-05-21 | Lecture interspersed with discussions |
| 51 | CONDENSATION: Film wise and drop wise condensation | 02-06-21 | |
| 52 | nusselt's theory of condensation on a vertical plate | 02-06-21 | |
| 53 | film condensation on vertical and horizontal cylinders using empirical correlations | 03-06-21 | |
| 54 | HEAT EXCHANGERS | 04-06-21 | |
| 55 | Classification of heat exchangers | 05-06-21 | |
| 56 | overall heat transfer coefficient and fouling factor | 07-06-21 | |
| 57 | concepts of LMTD and NTU methods | 09-06-21 | |
| 58 | Problems | 09-06-21 | |
| 59 | Problems | 10-06-21 | |
| UNIT-VI WORK – RADIATION HEAT TRANSFER | | | |
| CO6: Become familiar with concepts of emission characteristics, heat exchange between grey bodies. | | | |
| TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT. | | | |
| | UNIT – 6 RADIATION HEAT TRANSFER | | |
| 60 | Emission characteristics and laws of black-body radiation | 11-06-21 | Lecture interspersed with discussions |
| 61 | Irradiation | 12-06-21 | |
| 62 | total and monochromatic quantities | 14-06-21 | |
| 63 | laws of Planck, Wien, Kirchoff | 16-06-21 | |
| 64 | Lamber, Stefan and Boltzmann | 16-06-21 | |
| 65 | heat exchange between two black bodies | 17-06-21 | |
| 66 | concepts of shape factor | 18-06-21 | |
| 67 | Emissivity – heat exchange between grey bodies | 19-06-21 | |
| 68 | radiation shields | 21-06-21 | |
| 69 | electrical analogy for radiation networks | 23-06-21 | |
| 70 | Problems | 23-06-21 | |
| 71 | Problems | 24-06-21 | |
| 72 | Problems | 25-06-21 | |

| | | | |
|----|----------|----------|--|
| 73 | Problems | 26-06-21 | |
|----|----------|----------|--|

TB: "HEAT AND MASS TRANSFER", Er R.K.RAJPUT.



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TENTATIVE LESSON PLAN: R163203B

COMPUTER GRAPHICS

| | | | |
|---|--|------------------------------|---------------------------------------|
| Course: COMPUTER GRAPHICS (OPEN ELECTIVE) | | Course code: R163203B | |
| Section : Sec A | Date : 22/03/2021 | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By: A.STANLY KUMAR | Approved By : HOD | |
| Tools: BLACK BOARD | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I :INTRODUCTION: Application areas of computer graphics. CO1: Understand the fundamental concepts and theory of computer graphics TB : . Computer Graphics Principles & practice-second edition in C/ Foley, VanDam, Feiner andHughes/Pearson Education | | | |
| 1 | INTRODUCTION: Application areas of computer graphics | 22/03/21 | Lecture interspersed with discussions |
| 2 | Overview of graphic system | 23/03/21 | |
| 3 | Video-display devices | 23/03/21 | |
| 4 | Raster-scan systems | 24/03/21 | |
| 5 | Random scan systems | 24/03/21 | |
| 6 | Graphics monitors | 25/03/21 | |
| 7 | Work stations and input devices | 26/03/21 | |
| 8 | | 30/03/21 | |
| 9 | | 31/03/21 | |
| UNIT-II :OUTPUT PRIMITIVES. CO2: Understand the fundamental concepts of OUTPUT PRIMITIVES TB: Computer Graphics Principles & practice-second edition in C/ Foley, VanDam, Feiner andHughes/Pearson Education | | | |
| 10 | OUTPUT PRIMITIVES | 05/04/21 | Lecture interspersed with discussions |
| 11 | Points and lines | 05/04/21 | |
| 12 | Line drawing algorithms | 06/04/21 | |
| 13 | Mid-point circle algorithm | 07/04/21 | |
| 14 | Filled area primitives | 08/04/21 | |
| 15 | Scan-line polygon fill algorithm | 09/04/21 | |
| 16 | Boundary-fill and flood-fill algorithm. | 12/04/21 | |
| 17 | 2-D GEOMETRICAL TRANSFORMATIONS | 15/04/21 | |
| 18 | Translation, scaling, rotation | 16/04/21 | |
| | Reflection and shear transformation | 17/04/21 | |
| | Matrix representations and homogeneous co-ordinates | 18/04/21 | |
| | Composite transformations | 19/04/21 | |
| | Transformations between coordinates | 20/04/21 | |
| UNIT-III :2-D VIEWING. | | | |

O3: The underlying 2-D VIEWING TB : Computer Graphics Principles & practice-second edition in C/ Foley, VanDam, Feiner and Hughes/Pearson Education.

| | | | |
|----|---|----------|---------------------------------------|
| 19 | 2-D VIEWING | 26/04/21 | Lecture interspersed with discussions |
| 20 | The viewing pipe-line | 27/04/21 | |
| 21 | Viewing coordinate reference frame | 28/04/21 | |
| 22 | Window to view-port co-ordinate Transformations | 28/04/21 | |
| 23 | Viewing function | 29/04/21 | |
| 24 | Cohen-Sutherland algorithms | 30/04/21 | |
| 25 | Cyrus-beck line clipping algorithms | 03/05/21 | |
| 26 | SutherlandHodgeman polygon clipping algorithm | 04/05/21 | |
| 30 | | 05/05/21 | |
| 31 | | 06/05/21 | |
| 32 | | 07/05/21 | |

UNIT-IV : Understand modeling, and interactive control of 3D computer graphics applications

CO4: The underlying parametric surface concepts be understood

TB : Computer Graphics Principles & practice-second edition in C/ Foley, VanDam, Feiner and Hughes/Pearson Education.

| | | | |
|----|------------------------------|----------|---------------------------------------|
| 30 | 3-D OBJECT REPRESENTATION | 13/05/21 | Lecture interspersed with discussions |
| 31 | Spline representation | 17/05/21 | |
| 32 | Hermite curve, | 18/05/21 | |
| 33 | Bezier curve | 19/05/21 | |
| 34 | B-spline curve | 20/05/21 | |
| 35 | Polygon surfaces | 21/05/21 | |
| | Quadric surfaces | 24/05/21 | |
| | Solid modeling Schalars | 25/05/21 | |
| | Wire frame | 26/05/21 | |
| | CSG | 27/05/21 | |
| | B-rep | 28/05/21 | |
| | Bezier and B-spline surfaces | 28/05/21 | |
| | Basic illumination models | 30/05/21 | |
| | Shading algorithms | 31/05/21 | |

UNIT-V : 3-D GEOMETRIC TRANSFORMATIONS.

CO5: Students are able to understand 3-D GEOMETRIC TRANSFORMATIONS.

TB : Computer Graphics Principles & practice-second edition in C/ Foley, VanDam, Feiner and Hughes/Pearson Education

| | | | |
|----|-------------------------------|----------|---------------------------------------|
| 36 | 3-D GEOMETRIC TRANSFORMATIONS | 01/06/21 | Lecture interspersed with discussions |
| 37 | Translation, rotation | 02/06/21 | |
| 38 | Scaling, reflection | 03/06/21 | |
| 39 | Shear transformation | 04/06/21 | |

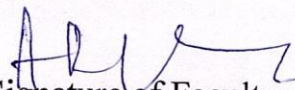
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| 40 | Composite transformations | 07/06/21 | |
| 41 | Visible surface detection methods | 08/06/21 | |
| 42 | Classification, back-face detection | 09/06/21 | |
| 43 | Depthbuffer, , | 10/06/21 | |
| | Scan-line | 01/06/21 | |
| | Depth sorting | 02/06/21 | |


UNIT-VI : COMPUTER ANIMATION.

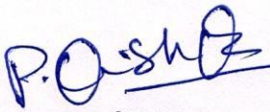
CO6:Able to know the COMPUTER ANIMATION.

TB : Computer Graphics Principles & practice-second edition in C/ Foley, VanDam, Feiner andHughes/Pearson Education

| | | | |
|----|--------------------------------------|----------|---------------------------------------|
| 44 | COMPUTER ANIMATION | 18/06/21 | Lecture interspersed with discussions |
| 45 | Design of animation sequence | 21/06/21 | |
| 46 | General computer animation functions | 22/06/21 | |
| 47 | Raster animation | 23/06/21 | |
| 48 | Computer animation language | 24/06/21 | |
| 49 | Key frame system | 25/06/21 | |
| 50 | Motion specification | 28/06/21 | |
| 51 | Revision | 29/06/21 | |
| 52 | Revision | 30/06/21 | |


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**TENTATIVE LESSON PLAN: R163203C
INDUSTRIAL ROBOTICS**

| Course Title: INDUSTRIAL ROBOTICS | | Course code: R163203C | |
|---|---|------------------------------|---------------------------------------|
| Date : 22-03-2021 | | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By: R. KARUN KUMAR | Approved By : HOD | |
| Tools: BLACK BOARD, PPTs | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION | | | |
| CO1: The students will able to apply their knowledge of mathematics, science, and Engineering into the vast area of robotics | | | |
| TB: "Introduction to Robotics ", SAEED B. NIKU, 2ndEdition, WILEY. | | | |
| 1 | Automation and Robotics | 22-03-21 | Lecture interspersed with discussions |
| 2 | CAD/CAM and Robotics | 23-03-21 | |
| 3 | An over view of Robotics | 24-03-21 | |
| 4 | present | 25-03-21 | |
| 5 | future applications | 26-03-21 | |
| 6 | Degrees Of Freedom | 27-03-21 | |
| 7 | classification by coordinate system and control system. | 29-03-21 | |
| UNIT-II COMPONENTS OF THE INDUSTRIAL ROBOTICS | | | |
| CO2: Able to Identify various robot configuration and components | | | |
| TB: "Introduction to Robotics ", SAEED B. NIKU, 2ndEdition, WILEY. | | | |
| 8 | Function line diagram representation of robot arms | 30-03-21 | Lecture interspersed with discussions |
| 9 | common types of arms | 31-03-21 | |
| 10 | Components, Architecture | 01-04-21 | |
| 11 | number of degrees of freedom | 03-04-21 | |
| 12 | Requirements and challenges of end effectors | 05-04-21 | |
| 13 | Determination of the end effectors | 06-04-21 | |
| 14 | comparison of Electric | 07-04-21 | |
| 15 | Hydraulic and Pneumatic types of locomotion devices | 08-04-21 | |
| UNIT-III MOTION ANALYSIS AND MANIPULATOR KINEMATICS | | | |
| CO3: Able to apply Forward and inverse kinematics equations | | | |
| TB: "Introduction to Robotics ", SAEED B. NIKU, 2ndEdition, WILEY. | | | |
| 16 | Homogeneous transformations as applicable to rotation and translation | 09-04-21 | Lecture interspersed with discussions |
| | Rotation about x-axis | 12-04-21 | |
| | Rotation about y-axis | 15-04-21 | |
| | Rotation about z-axis | 16-04-21 | |

| | | | |
|----|--|----------|--|
| 17 | problems | 17-04-21 | |
| 18 | MANIPULATOR KINEMATICS: Specifications of matrices | 19-04-21 | |
| 19 | D-H notation joint coordinates | 20-04-21 | |
| 20 | world coordinates Forward and inverse kinematics | 22-04-21 | |
| 21 | problems | 23-04-21 | |
| 22 | problem | 24-04-21 | |
| 23 | problem | 26-04-21 | |
| 24 | problem | 27-04-21 | |

UNIT-IV DIFFERENTIAL KINEMATICS AND ROBOT DYNAMICS
CO4: Able to Carry out kinematic and dynamic analysis for simple serial kinematic chains

TB: "Introduction to Robotics ", SAEED B. NIKU, 2nd Edition, WILEY.

| | | | |
|----|--|----------|---------------------------------------|
| 25 | Differential transformation and manipulators | 28-04-21 | Lecture interspersed with discussions |
| 26 | Jacobians | 29-04-21 | |
| 27 | problem | 03-05-21 | |
| 28 | problem | 04-05-21 | |
| 29 | problem | 05-05-21 | |
| 30 | Dynamics: Lagrange | 06-05-21 | |
| 31 | Euler and Newton | 07-05-21 | |
| 32 | Euler formulations | 10-05-21 | |
| 33 | Problems | 11-05-21 | |
| 34 | Problem | 12-05-21 | |
| 35 | Problem | 13-05-21 | |
| 36 | Problem | 15-05-21 | |

UNIT-V TRAJECTORY PLANNING

CO5: Able to Perform trajectory planning for a manipulator by avoiding obstacles.

TB: "Introduction to Robotics ", SAEED B. NIKU, 2nd Edition, WILEY.

| | | | |
|----|---|----------|---------------------------------------|
| 37 | General considerations in path description and generation | 17-05-21 | Lecture interspersed with discussions |
| 38 | Trajectory planning and avoidance of obstacles | 18-05-21 | |
| 39 | path planning | 19-05-21 | |
| 40 | Skew motion, | 21-05-21 | |
| 41 | joint integrated motion | 24-05-21 | |
| 42 | straight line motion | 25-05-21 | |
| 43 | Robot programming | 26-05-21 | |
| 44 | languages and software packages | 28-05-21 | |
| 45 | Description of paths with a robot programming language | 31-05-21 | |

UNIT-VI ROBOT ACTUATORS AND FEED BACK COMPONENTS AND APPLICATIONS

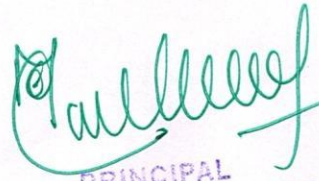
CO6: Able to Select appropriate actuators and sensors for a robot based on specific application

TB: "Introduction to Robotics ", SAEED B. NIKU, 2nd Edition, WILEY.

| | | | |
|----|---|----------|---------------------------------------|
| 46 | Actuators: Pneumatic | 01-06-21 | Lecture interspersed with discussions |
| 47 | Hydraulic actuators | 03-06-21 | |
| 48 | electric & stepper motors | 05-06-21 | |
| 49 | Feedback components | 08-06-21 | |
| 50 | position sensors | 10-06-21 | |
| 51 | potentiometers | 11-06-21 | |
| 52 | resolvers | 14-06-21 | |
| 53 | encoders | 15-06-21 | |
| 54 | Velocity sensors | 17-06-21 | |
| 55 | ROBOT APPLICATIONS IN MANUFACTURING: Material Transfer | 19-06-21 | |
| 56 | Material handling, | 21-06-21 | |
| 57 | loading and unloading | 22-06-21 | |
| 58 | Processing | 24-06-21 | |
| 59 | spot and continuous arc welding | 26-06-21 | |
| 60 | spray painting | 28-06-21 | |
| 61 | Assembly and Inspection. | 30-06-21 | |
| | | | |

TB: "Introduction to Robotics ", SAEED B. NIKU, 2nd Edition, WILEY.


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TENTATIVE LESSON PLAN
R1642031 PRODUCTION PLANNING AND CONTROL

| | | |
|--|-------------------------------------|------------------------------|
| Course Title: PRODUCTION PLANNING AND CONTROL | | Course Code: R1642031 |
| Section : Sec A | Date : 22/03/2021 | Page No : 01 of 03 |
| Revision No : 00 | Prepared By : P KISHOREKUMAR | Approved By : HOD |

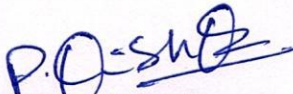
Tools: Black board, PPTs

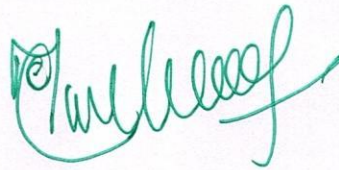
| No. of Periods | TOPIC | Date | Mode of Delivery |
|---|---|------------|---------------------------------------|
| UNIT-I INTRODUCTION | | | |
| CO1: Able to understand the concepts of production and service systems. | | | |
| TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp. | | | |
| 1 | Introduction: Definition | 22/03/2021 | Lecture interspersed with discussions |
| 2 | Objectives and functions of production planning and control | 23/03/2021 | |
| 3 | Elements of production control | 24/03/2021 | |
| 4 | Types of production | 26/03/2021 | |
| 5 | Organization of production planning and control department | 26/03/2021 | |
| 6 | Internal organization of department | 29/03/2021 | |
| 7 | Importance and applications of production control | 29/03/2021 | |
| 8 | Practice on above topics | 30/03/2021 | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-II FORECASTING | | | |
| CO2: Able to understand the concepts of forecasting and its techniques. | | | |
| TB: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill | | | |
| 1 | Introduction about forecasting | 30/03/2021 | |


| | | | |
|--|--|-------------|---------------------------------------|
| 2 | Forecasting – importance of forecasting | 31/03/2021 | Lecture interspersed with discussions |
| 3 | Types of forecasting | 05/04/2021 | |
| 4 | Types of forecasting | 06/04/2021 | |
| 5 | Their uses – general principles of forecasting | 07/04/2021 | |
| 6 | Forecasting techniques | 09/04/2021 | |
| 7 | Qualitative methods and quantitative methods | 12/04/2021 | |
| 8 | Principles and techniques in the design | 16/04/2021 | |
| 9 | Best use of resources in achieving their objectives | 19/04/2021 | |
| 10 | Planning and control of these systems to optimize | 20/04/2021 | |
| No. of Periods | TOPIC | Date | |
| UNIT-III Inventory management | | | |
| CO3: Able to identify Inventory management techniques | | | |
| TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp. | | | |
| 1 | Inventory management | 23/04/2021 | Lecture interspersed with discussions |
| 2 | Functions of inventories – relevant inventory costs | 26/04/2021 | |
| 3 | ABC analysis – VED analysis | 26/04/2021 | |
| 4 | EOQ model – Inventory control systems | 27/04/2021 | |
| 5 | P-Systems and Q-Systems | 28/04/2021 | |
| 6 | Introduction to MRP I, MRP II, ERP, LOB(Line of Balance) | 30/04/2021 | |
| 7 | JIT and KANBAN system | 03/05/2021 | |
| 8 | MRP II, ERP, LOB(Line of Balance), | 04/05/2021 | |
| 9 | EOQ model – Inventory control systems | 05/05/2021 | |
| 10 | P-Systems and Q-Systems | 05/05/2021 | |
| 11 | Revision on above topics | 17/05/2021 | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-IV ROUTING | | | |
| CO4: Able to understand Routing procedure and scheduling | | | |

| TB: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/Tata Mc Graw-Hill | | | |
|--|---|-------------|---------------------------------------|
| 1 | Routing – definition | 17/05/2021 | Lecture interspersed with discussions |
| 2 | Routing procedure –route sheets | 18/05/2021 | |
| 3 | Bill of material – factors affecting routing procedure, | 19/05/2021 | |
| 4 | Schedule –definition – difference with loading | 21/05/2021 | |
| 5 | Factors affecting routing procedure | 24/05/2021 | |
| 6 | Revision on above topics | 25/05/2021 | |
| 7 | Revision on above topics | 25/05/2021 | |
| No. of Periods | TOPIC | 26/05/2021 | Mode of Delivery |
| UNIT-V Scheduling policies – techniques | | | |
| CO5: Able to UNNDERSTAND Scheduling policies – techniques | | | |
| T TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp | | | |
| 1 | Scheduling policies – techniques | 28/05/2021 | Lecture interspersed with discussions |
| 2 | Standard scheduling methods | 31/05/2021 | |
| 3 | Line Balancing | 01/06/2021 | |
| 4 | Aggregate planning | 02/06/2021 | |
| 5 | Chase planning | 04/06/2021 | |
| 6 | Expediting, and controlling aspects | 07/06/2021 | |
| 7 | Revision on above topics | 07/06/2021 | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-VI Dispatching | | | |
| CO6: Able to UNNDERSTAND Dispatching and follow up procedure | | | |
| TB: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/Tata McGraw-Hill | | | |
| 1 | Dispatching – activities of dispatcher | 08/06/2021 | Lecture interspersed |
| 2 | Dispatching procedure – follow up | 11/06/2021 | |
| 3 | Definition – reason for existence of functions | 14/06/2021 | |

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| 4 | Types of follow up | 18/06/2021 | with |
| 5 | Applications of computer in production planning and control | 21/06/2021 | discussions |
| 6 | Importance of computer in production planning and control | 22/06/2021 | |
| 7 | Dispatching – activities of dispatcher | 23/03/2021 | |
| 8 | Revision | 28/06/2021 | |
| 9 | Revision | 30/06/2021 | |


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TENTATIVE LESSON PLAN
R1642031 PRODUCTION PLANNING AND CONTROL

| | | |
|--|-------------------------------------|------------------------------|
| Course Title: PRODUCTION PLANNING AND CONTROL | | Course Code: R1642031 |
| Section : Sec B | Date : 22/03/2021 | Page No : 01 of 03 |
| Revision No : 00 | Prepared By : P KISHOREKUMAR | Approved By : HOD |

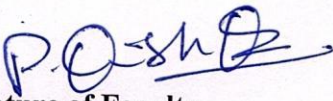
Tools: Black board, PPTs

| No. of Periods | TOPIC | Date | Mode of Delivery |
|---|---|------------|---------------------------------------|
| UNIT-I INTRODUCTION | | | |
| CO1: Able to understand the concepts of production and service systems. | | | |
| TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp. | | | |
| 1 | Introduction: Definition | 22/03/2021 | Lecture interspersed with discussions |
| 2 | Objectives and functions of production planning and control | 23/03/2021 | |
| 3 | Elements of production control | 25/03/2021 | |
| 4 | Types of production | 26/03/2021 | |
| 5 | Organization of production planning and control department | 27/03/2021 | |
| 6 | Internal organization of department | 30/03/2021 | |
| 7 | Importance and applications of production control | 31/03/2021 | |
| 8 | Practice on above topics | 01/04/2021 | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-II FORECASTING | | | |
| CO2: Able to understand the concepts of forecasting and its techniques. | | | |
| TB: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/TataMcGrawHill | | | |
| 1 | Introduction about forecasting | 05/04/2021 | |

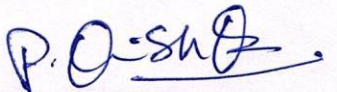
| | | | |
|--|--|-------------|---------------------------------------|
| 2 | Forecasting – importance of forecasting | 06/04/2021 | Lecture interspersed with discussions |
| 3 | Types of forecasting | 08/04/2021 | |
| 4 | Types of forecasting | 10/04/2021 | |
| 5 | Their uses – general principles of forecasting | 12/04/2021 | |
| 6 | Forecasting techniques | 15/04/2021 | |
| 7 | Qualitative methods and quantitative methods | 17/04/2021 | |
| 8 | Principles and techniques in the design | 19/04/2021 | |
| 9 | Best use of resources in achieving their objectives | 22/04/2021 | |
| 10 | Planning and control of these systems to optimize | 26/04/2021 | |
| No. of Periods | TOPIC | Date | |
| UNIT-III Inventory management | | | |
| CO3: Able to identify Inventory management techniques | | | |
| TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp. | | | |
| 1 | Inventory management | 27/04/2021 | Lecture interspersed with discussions |
| 2 | Functions of inventories – relevant inventory costs | 28/04/2021 | |
| 3 | ABC analysis – VED analysis | 29/04/2021 | |
| 4 | EOQ model – Inventory control systems | 30/04/2021 | |
| 5 | P-Systems and Q-Systems | 02/05/2021 | |
| 6 | Introduction to MRP I, MRP II, ERP, LOB(Line of Balance) | 02/05/2021 | |
| 7 | JIT and KANBAN system | 03/05/2021 | |
| 8 | MRP II, ERP, LOB(Line of Balance), | 05/05/2021 | |
| 9 | EOQ model – Inventory control systems | 07/05/2021 | |
| 10 | P-Systems and Q-Systems | 17/05/2021 | |
| 11 | Revision on above topics | 18/05/2021 | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-IV ROUTING | | | |
| CO4: Able to understand Routing procedure and scheduling | | | |

| TB: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/Tata Mc Graw-Hill | | | |
|--|---|-------------|---------------------------------------|
| 1 | Routing – definition | 18/05/2021 | Lecture interspersed with discussions |
| 2 | Routing procedure –route sheets | 19/05/2021 | |
| 3 | Bill of material – factors affecting routing procedure, | 21/05/2021 | |
| 4 | Schedule –definition – difference with loading | 24/05/2021 | |
| 5 | Factors affecting routing procedure | 27/05/2021 | |
| 6 | Revision on above topics | 28/05/2021 | |
| 7 | Revision on above topics | 31/05/2021 | |
| No. of Periods | TOPIC | 01/06/2021 | Mode of Delivery |
| UNIT-V Scheduling policies – techniques | | | |
| CO5: Able to UNNDERSTAND Scheduling policies – techniques | | | |
| T TB: Elements of Production Planning and Control / Samuel Eilon/Universal Book Corp | | | |
| 1 | Scheduling policies – techniques | 02/06/2021 | Lecture interspersed with discussions |
| 2 | Standard scheduling methods | 03/06/2021 | |
| 3 | Line Balancing | 04/06/2021 | |
| 4 | Aggregate planning | 07/06/2021 | |
| 5 | Chase planning | 08/06/2021 | |
| 6 | Expediting, and controlling aspects | 12/06/2021 | |
| 7 | Revision on above topics | 14/06/2021 | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-VI Dispatching | | | |
| CO6: Able to UNNDERSTAND Dispatching and follow up procedure | | | |
| TB: Manufacturing, Planning and Control/Partik Jonsson Stig-Arne Mattsson/Tata McGraw-Hill | | | |
| 1 | Dispatching – activities of dispatcher | 15/06/2021 | Lecture interspersed |
| 2 | Dispatching procedure – follow up | 17/06/2021 | |
| 3 | Definition – reason for existence of functions | 19/06/2021 | |

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| 4 | Types of follow up | 21/06/2021 | with discussions |
| 5 | Applications of computer in production planning and control | 22/06/2021 | |
| 6 | Importance of computer in production planning and control | 23/06/2021 | |
| 7 | Dispatching – activities of dispatcher | 23/03/2021 | |
| 8 | Revision | 26/06/2021 | |
| 9 | Revision | 30/06/2021 | |


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TENTATIVE LESSON PLAN: R1642032
Un-Conventional Machining Processes

| | | |
|--|-------------------------------------|---------------------------|
| Course Title: Un-Conventional Machining processes | | |
| Section : Sec A | Date : 22-03-2021 | Page No : 01 of 04 |
| 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 and Ultrasonic Machining | | | |
| CO1: TB: Advanced machining processes/ VK Jain/ Allied publishers, Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 1 | Need for non-traditional machining methods | 22/03/2021 | Lecture interspersed with discussions |
| 2 | classification of modern machining processes | 23/03/2021 | |
| 3 | considerations in process selection, applications | 24/03/2021 | |
| 4 | Ultrasonic machining- Elements of the process | 25/03/2021 | |
| 5 | mechanics of material removal | 27/03/2021 | |
| 6 | MRR process parameters | 30/03/2021 | |
| 7 | economic considerations, applications and limitations | 31/03/2021 | |
| 8 | applications and limitations | 01/04/2021 | |
| UNIT-II Electro-Chemical Machining | | | |
| CO2: TB: Advanced machining processes/ VK Jain/ Allied publishers, Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 9 | Fundamentals of electro chemical machining | 05/04/2021 | |
| 10 | electrochemical grinding | 06/04/2021 | |
| 11 | electro chemical honing | 08/04/2021 | |
| 12 | chemical deburring process | 10/04/2021 | |
| 13 | metal removal rate in ECM | 12/04/2021 | |
| 14 | Tool design | 15/04/2021 | |

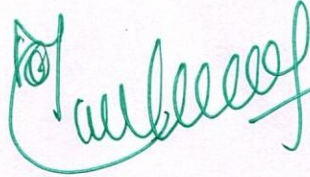
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| 15 | Surface finish and accuracy | 17/04/2021 | Lecture interspersed with discussions |
| 16 | economic aspects of ECM | 19/04/2021 | |
| 17 | Simple problems for estimation of metal removal rate | 19/04/2021 | |
| 18 | fundamentals of chemical machining, | 22/04/2021 | |
| 19 | advantages and applications | 26/04/2021 | |
| UNIT-III Thermal Metal Removal Processes | | | |
| CO3: TB: Advanced machining processes/ VK Jain/ Allied publishers, | | | |
| Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 20 | General principle and applications of Electric Discharge Machining | 27/04/2021 | Lecture interspersed with discussions |
| 21 | Electric Discharge Grinding | 28/04/2021 | |
| 22 | wire EDM | 29/04/2021 | |
| 23 | Power circuits for EDM | 30/04/2021 | |
| 24 | Mechanics of metal removal in EDM | 02/05/2021 | |
| 25 | Process parameters | 02/05/2021 | |
| 26 | selection of tool electrode and dielectric fluids | 03/05/2021 | |
| 27 | surface finish and machining accuracy | 05/05/2021 | |
| 28 | characteristics of spark eroded surface | 07/05/2021 | |
| UNIT-IV Electron Beam Machining, Laser Beam Machining | | | |
| CO4: TB: Advanced machining processes/ VK Jain/ Allied publishers, | | | |
| Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 29 | UNIT –IV Electron Beam Machining Basic principle and theory | 17/05/2021 | Lecture interspersed with discussions |
| 30 | Laser Beam Machining | 18/05/2021 | |
| 31 | Basic principle and theory | 19/05/2021 | |
| 32 | Practical approach and applications of LBM | 21/05/2021 | |

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|---|---|------------|---------------------------------------|
| 33 | mechanics of material removal | 25/05/2021 | |
| 34 | process parameters | 27/05/2021 | |
| 35 | efficiency & accuracy, | 28/05/2021 | |
| 36 | Applications of LBM | 31/05/2021 | |
| UNIT-V Plasma Arc Machining | | | |
| CO5: TB: Advanced machining processes/ VK Jain/ Allied publishers, Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 37 | Application of plasma for machining | 01/06/2021 | Lecture interspersed with discussions |
| 38 | metal removal mechanism | 02/06/2021 | |
| 39 | process parameters, | 03/06/2021 | |
| 40 | Other applications of plasma in manufacturing industries | 04/06/2021 | |
| 41 | accuracy and surface finish of PAM | 07/06/2021 | |
| 42 | Practical importance and role in industry | 08/06/2021 | |
| UNIT-VI Other Machining Processes | | | |
| CO6: TB: Advanced machining processes/ VK Jain/ Allied publishers, Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 43 | UNIT – VI Abrasive jet machining- Basic principles equipments | 12/06/2021 | Lecture interspersed with discussions |
| 44 | process variables | 14/06/2021 | |
| 45 | mechanics of material removal | 15/06/2021 | |
| 46 | MRR, application and limitation. | 17/06/2021 | |
| 47 | Water jet machining- Basic principles, equipments | 19/06/2021 | |
| 48 | process variables | 21/06/2021 | |
| 49 | mechanics of material removal | 22/06/2021 | |
| 50 | MRR, application and limitations | 23/06/2021 | |

| | | | |
|----|--|------------|--|
| 51 | abrasive water jet machining- Basic principles, equipments | 23/06/2021 | |
| 52 | process variables | 24/06/2021 | |
| 53 | mechanics of material removal | 25/06/2021 | |
| 54 | MRR, application and limitations | 26/06/2021 | |
| 55 | Magnetic abrasive finishing | 27/06/2021 | |
| 56 | abrasive flow finishing | 28/06/2021 | |
| 57 | Electro stream drilling | 29/06/2021 | |
| 58 | shaped tube electrolytic machining | 30/06/2021 | |



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TENTATIVE LESSON PLAN: R1642032
Un-Conventional Machining Processes


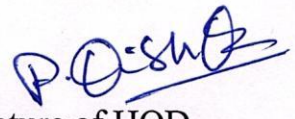
| Course Title: Un-Conventional Machining processes | | | |
|---|---|---------------------------|---------------------------------------|
| Section : Sec B | Date : 22-03-2021 | Page No : 01 of 04 | |
| Revision No : 00 | Prepared By : D ROGNATHA RAO | Approved By : HOD | |
| Tools: Black Board, PPTs | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I Introduction and Ultrasonic Machining | | | |
| CO1: TB: Advanced machining processes/ VK Jain/ Allied publishers, | | | |
| Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 1 | Need for non-traditional machining methods | 23/03/2021 | Lecture interspersed with discussions |
| 2 | classification of modern machining processes | 24/03/2021 | |
| 3 | considerations in process selection, applications | 25/03/2021 | |
| 4 | Ultrasonic machining- Elements of the process | 26/03/2021 | |
| 5 | mechanics of material removal | 27/03/2021 | |
| 6 | MRR process parameters | 30/03/2021 | |
| 7 | economic considerations, applications and limitations | 31/03/2021 | |
| 8 | applications and limitations | 01/04/2021 | |
| UNIT-II Electro-Chemical Machining | | | |
| CO2: TB: Advanced machining processes/ VK Jain/ Allied publishers, | | | |
| Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 9 | Fundamentals of electro chemical machining | 05/04/2021 | Lecture interspersed with discussions |
| 10 | electrochemical grinding | 06/04/2021 | |
| 11 | electro chemical honing | 08/04/2021 | |
| 12 | chemical deburring process | 10/04/2021 | |
| 13 | metal removal rate in ECM | 12/04/2021 | |
| 14 | Tool design | 15/04/2021 | |

| | | | |
|---|---|------------|---------------------------------------|
| 15 | Surface finish and accuracy | 17/04/2021 | Lecture interspersed with discussions |
| 16 | economic aspects of ECM | 19/04/2021 | |
| 17 | Simple problems for estimation of metal removal rate | 19/04/2021 | |
| 18 | fundamentals of chemical machining, | 22/04/2021 | |
| 19 | advantages and applications | 26/04/2021 | |
| UNIT-III Thermal Metal Removal Processes | | | |
| CO3: TB: Advanced machining processes/ VK Jain/ Allied publishers, | | | |
| Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 20 | General principle and applications of Electric Discharge Machining | 27/04/2021 | Lecture interspersed with discussions |
| 21 | Electric Discharge Grinding | 28/04/2021 | |
| 22 | wire EDM | 29/04/2021 | |
| 23 | Power circuits for EDM | 30/04/2021 | |
| 24 | Mechanics of metal removal in EDM | 02/04/2021 | |
| 25 | Process parameters | 02/04/2021 | |
| 26 | selection of tool electrode and dielectric fluids | 03/05/2021 | |
| 27 | surface finish and machining accuracy | 05/05/2021 | |
| 28 | characteristics of spark eroded surface | 07/05/2021 | |
| UNIT-IV Electron Beam Machining, Laser Beam Machining | | | |
| CO4: TB: Advanced machining processes/ VK Jain/ Allied publishers, | | | |
| Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 29 | UNIT -IV Electron Beam Machining Basic principle and theory | 17/05/2021 | Lecture interspersed with discussions |
| 30 | Laser Beam Machining | 18/05/2021 | |
| 31 | Basic principle and theory | 19/05/2021 | |
| 32 | Practical approach and applications of LBM | 21/05/2021 | |

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|---|---|------------|---------------------------------------|
| 33 | mechanics of material removal | 25/05/2021 | |
| 34 | process parameters | 27/05/2021 | |
| 35 | efficiency & accuracy, | 28/05/2021 | |
| 36 | Applications of LBM | 31/05/2021 | |
| UNIT-V Plasma Arc Machining | | | |
| CO5: TB: Advanced machining processes/ VK Jain/ Allied publishers, Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 37 | Application of plasma for machining | 01/06/2021 | Lecture interspersed with discussions |
| 38 | metal removal mechanism | 02/06/2021 | |
| 39 | process parameters, | 03/06/2021 | |
| 40 | Other applications of plasma in manufacturing industries | 04/06/2021 | |
| 41 | accuracy and surface finish of PAM | 07/06/2021 | |
| 42 | Practical importance and role in industry | 08/06/2021 | |
| UNIT-VI Other Machining Processes | | | |
| CO6: TB: Advanced machining processes/ VK Jain/ Allied publishers, Modern Machining Process / Pandey P.C. and Shah H.S./ TMH | | | |
| 43 | UNIT – VI Abrasive jet machining- Basic principles equipments | 12/06/2021 | Lecture interspersed with discussions |
| 44 | process variables | 14/06/2021 | |
| 45 | mechanics of material removal | 15/06/2021 | |
| 46 | MRR, application and limitation. | 17/06/2021 | |
| 47 | Water jet machining- Basic principles, equipments | 19/06/2021 | |
| 48 | process variables | 21/06/2021 | |
| 49 | mechanics of material removal | 22/06/2021 | |
| 50 | MRR, application and limitations | 23/06/2021 | |

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|----|--|------------|--|
| 51 | abrasive water jet machining- Basic principles, equipments | 23/06/2021 | |
| 52 | process variables | 24/06/2021 | |
| 53 | mechanics of material removal | 25/06/2021 | |
| 54 | MRR, application and limitations | 26/06/2021 | |
| 55 | Magnetic abrasive finishing | 27/06/2021 | |
| 56 | abrasive flow finishing | 28/06/2021 | |
| 57 | Electro stream drilling | 29/06/2021 | |
| 58 | shaped tube electrolytic machining | 30/06/2021 | |


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TENTATIVE PLAN: R1642033

| Course Title: AUTOMOBILE ENGINEERING | | Course code: R1642033 | |
|---|---|------------------------------|---------------------------------------|
| Section: Sec A | Date: 22-03-2021 | Page No: 01 to 03 | |
| Revision No: 00 | Prepared By: U. TANOJ | Approved By: HOD | |
| Tools: BLACK BOARD | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION | | | |
| CO1: Able to understand basics of automobile engineering & their applications | | | |
| TB: "AUTOMOBILE ENGINEERING", Er KIRPAL SINGH. | | | |
| | UNIT-1: Introduction | | Lecture interspersed with discussions |
| 1 | Introduction: Components of four-wheeler automobile- Chassis & body | 22/03/21 | |
| 2 | Power unit- Power transmission | 23/03/21 | |
| 3 | Rear wheel drive, Front wheel drive & Four-wheel drive | 24/03/21 | |
| 4 | Types of Automobile Engines & Construction | 26/03/21 | |
| 5 | Turbo charging & Super charging | 26/03/21 | |
| 6 | Engine Lubrication system, Splash & Pressure lubrication system | 29/03/21 | |
| 7 | Oil filters & oil pumps | 29/03/21 | |
| 8 | Crankcase ventilation | 30/03/21 | |
| 9 | Engine service & reboring | 30/03/21 | |
| 10 | Decarbonization | 31/03/21 | |
| 11 | Nitriding of crankshaft | 31/03/21 | |
| UNIT-II TRANSMISSION SYSTEM | | | |
| CO2: Gain knowledge & become familiar with the functions of transmission system of an automobile & it's uses | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 2: Transmission system | | Lecture interspersed with discussions |
| 12 | Transmission system & Types of clutches | 05/04/21 | |
| 13 | Cone clutch, single plate clutch & multi-plate clutch | 06/04/21 | |
| 14 | Magnetic & centrifugal clutches | 07/04/21 | |
| 15 | Fluid fly-wheel & types of gear boxes | 09/04/21 | |
| 16 | Sliding mesh & construct mesh gear box | 12/04/21 | |
| 17 | Synchro mesh & Epicyclic gear box | 16/04/21 | |
| 18 | Overdrive torque convertor | 19/04/21 | |
| 19 | Propeller shaft & Hotch kiss drive | 20/04/21 | |
| 20 | Torque tube drive | 23/04/21 | |
| 21 | Universal joint | 26/04/21 | |
| 22 | Differential rear axles types | 26/04/21 | |
| 23 | Types of wheels & tires | 27/04/21 | |
| UNIT-III STEERING SYSTEM | | | |
| CO3: Able to understand fundamentals of Steering system in an automobile & its functions | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 3: Steering system | | Lecture interspersed with |
| 24 | Steering system introduction & steering geometry | 27/04/21 | |

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|----|---------------------------------|----------|-------------|
| 25 | Camber & caster angle | 28/04/21 | discussions |
| 26 | King-pin rake angle | 28/04/21 | |
| 27 | Combined angle toe-in & toe-out | 30/04/21 | |
| 28 | Center point steering | 30/04/21 | |
| 29 | Types of steering mechanisms | 03/05/21 | |
| 30 | Ackermann steering mechanism | 04/05/21 | |
| 31 | Types of steering gears | 05/05/21 | |
| 32 | Types of steering linkages | 05/05/21 | |

UNIT-IV SUSPENSION SYSTEM, BRAKING SYSTEM & ELECTRICAL SYSTEM

CO4: Able to understand fundamentals of suspension, braking & electrical systems & their functions & uses

TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.

| | | | |
|----|---|----------|---------------------------------------|
| | UNIT – 4 Suspension system, Braking system & Electrical system | | Lecture interspersed with discussions |
| | Suspension system | | |
| 33 | Suspension system introduction | 17/05/21 | |
| 34 | Objects of suspension system | 17/05/21 | |
| 35 | Rigid axle suspension system | 18/05/21 | |
| 36 | Torsion bar & Shock absorber | 19/05/21 | |
| 37 | Independent suspension systems | 21/05/21 | |
| 38 | Braking system | | |
| 39 | Braking system introduction & types of braking systems | 21/05/21 | |
| 40 | Mechanical brake system & Hydraulic brake system | 24/05/21 | |
| 41 | Master cylinder, wheel cylinder & tandem master cylinder | 25/05/21 | |
| 42 | Requirement of brake fluid brakes | 25/05/21 | |
| 43 | Pneumatic & vacuum brakes | 26/05/21 | |
| 44 | Electrical system | | |
| 45 | Electrical system & types of circuits | 26/05/21 | |
| 46 | Charging circuit, generator & current | 28/05/21 | |
| 47 | Voltage regulator & starting system | 28/05/21 | |
| 48 | Bendix drive mechanism | 28/05/21 | |
| 49 | Solenoid switch & lighting system | 31/05/21 | |
| 50 | Horns, Wiper & Fuel guage | 31/05/21 | |
| 51 | Oil pressure guage | 01/06/21 | |
| 52 | Engine temperature indicator system | 02/06/21 | |

UNIT-V ENGINE SPECIFICATION & SAFETY SYSTEMS

CO5: Gain knowledge & become familiar with the Engine specification & their safety systems of an automobile

TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN.

| | | | |
|----|--|----------|---------------------------------------|
| | UNIT – 5 Engine specification & safety systems | | Lecture interspersed with discussions |
| 53 | Engine specification & safety systems with regard to power | 04/06/21 | |
| 54 | Safety system with regard to speed, torque & no of cylinders | 04/06/21 | |
| 55 | Arrangement, lubrication & cooling | 07/06/21 | |
| 56 | Safety introduction & Types safety systems | 07/06/21 | |
| 57 | Seat belt construction | 08/06/21 | |
| 58 | Air bags types & Bumper | 09/06/21 | |

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|---|---|----------|---------------------------------------|
| 59 | Anti-lock braking systems (ABS) | 11/06/21 | |
| 60 | Wind shield | 14/06/21 | |
| 61 | Suspension sensors & traction control | 14/06/21 | |
| 62 | Mirrors & central locking | 15/06/21 | |
| 63 | effluents from power plants | 15/06/21 | |
| 64 | Electric windows | 16/06/21 | |
| 65 | Speed control in safety sytems | 16/06/21 | |
| UNIT-VI ENGINE EMISSION CONTROL & ENGINE SERVICE | | | |
| CO6: Able to understand the Emissions of an engine & its control & servicing | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 6 Engine emission control & service | | Lecture interspersed with discussions |
| 66 | Engine emission control introduction | 18/06/21 | |
| 67 | Types of pollutants | 18/06/21 | |
| 68 | Mechanism of formation | 21/06/21 | |
| 69 | Concentration measurement | 21/06/21 | |
| 70 | Methods of controlling engine modification | 22/06/21 | |
| 71 | Exhaust gas treatment | 22/06/21 | |
| 72 | Thermal & Catalytic convertors | 23/06/21 | |
| 73 | Use of alternative fuels for Emission control | 23/06/21 | |
| 74 | National & International pollution standards | 25/06/21 | |
| 75 | Engine Service introduction | 28/06/21 | |
| 76 | Service details of engine cylinder head | 28/06/21 | |
| 77 | Valves & Valve Mechanism | 29/06/21 | |
| 78 | Piston connecting rod assembly | 29/06/21 | |
| 79 | Cylinder block & crankshaft | 30/06/21 | |
| 80 | Main bearings service | 30/06/21 | |
| 81 | Engine re-assembly precautions | 30/06/21 | |

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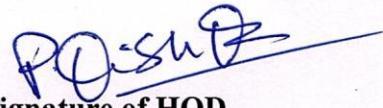
TENTATIVE PLAN: R1642033

| Course Title: AUTOMOBILE ENGINEERING | | Course code: R1642033 | |
|---|---|------------------------------|---------------------------------------|
| Section: Sec B | Date: 22-03-2021 | Page No: 01 to 03 | |
| Revision No: 00 | Prepared By: U. TANOJ | Approved By: HOD | |
| Tools: BLACK BOARD | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I INTRODUCTION | | | |
| CO1: Able to understand basics of automobile engineering & their applications | | | |
| TB: "AUTOMOBILE ENGINEERING", Er KIRPAL SINGH. | | | |
| | UNIT-1: Introduction | | Lecture interspersed with discussions |
| 1 | Introduction: Components of four-wheeler automobile- Chassis & body | 22/03/21 | |
| 2 | Power unit- Power transmission | 23/03/21 | |
| 3 | Rear wheel drive, Front wheel drive & Four-wheel drive | 24/03/21 | |
| 4 | Types of Automobile Engines & Construction | 25/03/21 | |
| 5 | Turbo charging & Super charging | 26/03/21 | |
| 6 | Engine Lubrication system, Splash & Pressure lubrication system | 29/03/21 | |
| 7 | Oil filters & oil pumps | 29/03/21 | |
| 8 | Crankcase ventilation | 30/03/21 | |
| 9 | Engine service & reboring | 30/03/21 | |
| 10 | Decarbonization | 31/03/21 | |
| 11 | Nitriding of crankshaft | 31/03/21 | |
| UNIT-II TRANSMISSION SYSTEM | | | |
| CO2: Gain knowledge & become familiar with the functions of transmission system of an automobile & it's uses | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 2: Transmission system | | Lecture interspersed with discussions |
| 12 | Transmission system & Types of clutches | 01/04/21 | |
| 13 | Cone clutch, single plate clutch & multi-plate clutch | 05/04/21 | |
| 14 | Magnetic & centrifugal clutches | 06/04/21 | |
| 15 | Fluid fly-wheel & types of gear boxes | 07/04/21 | |
| 16 | Sliding mesh & construct mesh gear box | 08/04/21 | |
| 17 | Synchro mesh & Epicyclic gear box | 09/04/21 | |
| 18 | Overdrive torque convertor | 12/04/21 | |
| 19 | Propeller shaft & Hotch kiss drive | 15/04/21 | |
| 20 | Torque tube drive | 16/04/21 | |
| 21 | Universal joint | 19/04/21 | |
| 22 | Differential rear axles types | 22/04/21 | |
| 23 | Types of wheels & tires | 23/04/21 | |
| UNIT-III STEERING SYSTEM | | | |
| CO3: Able to understand fundamentals of Steering system in an automobile & its functions | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 3: Steering system | | Lecture interspersed with |
| 24 | Steering system introduction & steering geometry | 26/04/21 | |

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|--|---|----------|---------------------------------------|
| 25 | Camber & caster angle | 27/04/21 | discussions |
| 26 | King-pin rake angle | 28/04/21 | |
| 27 | Combined angle toe-in & toe-out | 29/04/21 | |
| 28 | Center point steering | 30/04/21 | |
| 29 | Types of steering mechanisms | 03/05/21 | |
| 30 | Ackermann steering mechanism | 04/05/21 | |
| 31 | Types of steering gears | 05/05/21 | |
| 32 | Types of steering linkages | 06/05/21 | |
| UNIT-IV SUSPENSION SYSTEM, BRAKING SYSTEM & ELECTRICAL SYSTEM | | | |
| CO4: Able to understand fundamentals of suspension, braking & electrical systems & their functions & uses | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 4 Suspension system, Braking system & Electrical system | | Lecture interspersed with discussions |
| | Suspension system | | |
| 33 | Suspension system introduction | 17/05/21 | |
| 34 | Objects of suspension system | 17/05/21 | |
| 35 | Rigid axle suspension system | 18/05/21 | |
| 36 | Torsion bar & Shock absorber | 19/05/21 | |
| 37 | Independent suspension systems | 20/05/21 | |
| 38 | Braking system | | |
| 39 | Braking system introduction & types of braking systems | 21/05/21 | |
| 40 | Mechanical brake system & Hydraulic brake system | 24/05/21 | |
| 41 | Master cylinder, wheel cylinder & tandem master cylinder | 25/05/21 | |
| 42 | Requirement of brake fluid brakes | 25/05/21 | |
| 43 | Pneumatic & vacuum brakes | 26/05/21 | |
| 44 | Electrical system | | |
| 45 | Electrical system & types of circuits | 26/05/21 | |
| 46 | Charging circuit, generator & current | 27/05/21 | |
| 47 | Voltage regulator & starting system | 28/05/21 | |
| 48 | Bendix drive mechanism | 28/05/21 | |
| 49 | Solenoid switch & lighting system | 31/05/21 | |
| 50 | Horns, Wiper & Fuel guage | 31/05/21 | |
| 51 | Oil pressure guage | 01/06/21 | |
| 52 | Engine temperature indicator system | 02/06/21 | |
| UNIT-V ENGINE SPECIFICATION & SAFETY SYSTEMS | | | |
| CO5: Gain knowledge & become familiar with the Engine specification & their safety systems of an automobile | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 5 Engine specification & safety systems | | Lecture interspersed with discussions |
| 53 | Engine specification & safety systems with regard to power | 03/06/21 | |
| 54 | Safety system with regard to speed, torque & no of cylinders | 04/06/21 | |
| 55 | Arrangement, lubrication & cooling | 07/06/21 | |
| 56 | Safety introduction & Types safety systems | 07/06/21 | |
| 57 | Seat belt construction | 08/06/21 | |
| 58 | Air bags types & Bumper | 09/06/21 | |

| | | | |
|---|---|----------|---------------------------------------|
| 59 | Anti-lock braking systems (ABS) | 10/06/21 | |
| 60 | Wind shield | 11/06/21 | |
| 61 | Suspension sensors & traction control | 14/06/21 | |
| 62 | Mirrors & central locking | 15/06/21 | |
| 63 | effluents from power plants | 15/06/21 | |
| 64 | Electric windows | 16/06/21 | |
| 65 | Speed control in safety sytems | 16/06/21 | |
| UNIT-VI ENGINE EMISSION CONTROL & ENGINE SERVICE | | | |
| CO6: Able to understand the Emissions of an engine & its control & servicing | | | |
| TB: "AUTOMOBILE ENGINEERING", Er R.K. GOVINDAN. | | | |
| | UNIT – 6 Engine emission control & service | | Lecture interspersed with discussions |
| 66 | Engine emission control introduction | 17/06/21 | |
| 67 | Types of pollutants | 18/06/21 | |
| 68 | Mechanism of formation | 21/06/21 | |
| 69 | Concentration measurement | 22/06/21 | |
| 70 | Methods of controlling engine modification | 23/06/21 | |
| 71 | Exhaust gas treatment | 23/06/21 | |
| 72 | Thermal & Catalytic convertors | 24/06/21 | |
| 73 | Use of alternative fuels for Emission control | 24/06/21 | |
| 74 | National & International pollution standards | 25/06/21 | |
| 75 | Engine Service introduction | 25/06/21 | |
| 76 | Service details of engine cylinder head | 28/06/21 | |
| 77 | Valves & Valve Mechanism | 28/06/21 | |
| 78 | Piston connecting rod assembly | 29/06/21 | |
| 79 | Cylinder block & crankshaft | 29/06/21 | |
| 80 | Main bearings service | 30/06/21 | |
| 81 | Engine re-assembly precautions | 30/06/21 | |


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TENTATIVE LESSON PLAN: R164203B NON-DESTRUCTIVE EVALUATION

| | | |
|--|---------------------------------------|---------------------------|
| Course Title: NON-DESTRUCTIVE EVALUATION (ELECTIVE) | | |
| Section : | Date : 22/03/2021 | Page No : 01 of 03 |
| Revision No : 00 | Prepared By: P. Bhagya Lakshmi | Approved By : HOD |

Tools: Black board, PPTs

| No. of Periods | TOPIC | Date | Mode of Delivery |
|--|---|----------|---------------------------------------|
| UNIT-I INTRODUCTION TO NON-DESTRUCTIVE TESTING | | | |
| CO1: Able to understand the principle of radiographic technique, sources of radiographic rays, equipment & different techniques of radiography | | | |
| TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair | | | |
| 1 | Introduction to non-destructive testing, Applications | 22/03/21 | Lecture interspersed with discussions |
| 2 | Radiographic test: principle | 23/03/21 | |
| 3 | Advantages, dis- advantages & applications | 23/03/21 | |
| 4 | Sources of X rays | 24/03/21 | |
| 5 | Sources of Gamma Rays | 24/03/21 | |
| 6 | Properties of x & gamma rays and differences | 25/03/21 | |
| 7 | Interaction of X and Gamma rays with Matter | 26/03/21 | |
| 8 | Radiographic equipment | 30/03/21 | |
| 9 | Radiographic Techniques | 31/03/21 | |
| 10 | Safety Aspects of Industrial Radiography | 01/04/21 | |
| UNIT-II ULTRASONIC TEST | | | |
| CO2: Able to understand the ultrasonic test, ultrasonic transducers & their characteristics, interpretation of defects, effectiveness & limitations of testing. | | | |
| TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair | | | |
| 11 | Ultrasonics test: Introduction, | 05/04/21 | Lecture interspersed with discussions |
| 12 | Principle of Wave Propagation | 05/04/21 | |
| 13 | Reflection, Refraction, Diffraction | 06/04/21 | |
| 14 | Mode Conversion, Attenuation | 07/04/21 | |
| 15 | Sound Field, Piezo-electric Effect | 08/04/21 | |
| 16 | Ultrasonic Transducers and their Characteristics | 09/04/21 | |
| 17 | Ultrasonic Equipment | 12/04/21 | |
| 18 | Variables Affecting Ultrasonic Test | 15/04/21 | |
| 19 | Methods of testing | 16/04/21 | |
| 20 | Interpretations | 19/04/21 | |
| 21 | Guidelines for Acceptance, Rejection | 20/04/21 | |
| 22 | Ultrasonic Testing, and | 22/04/21 | |

| | | | |
|---|---|----------|---------------------------------------|
| 23 | Effectiveness and Limitations of Ultrasonic Testing.s | 23/04/21 | |
| UNIT-III LIQUID PENETRANT TEST & EDDY CURRENT TEST | | | |
| CO3: Able to understand the concept of liquid penetrant test & eddy current test, test procedure & its applications. | | | |
| TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair | | | |
| 24 | Liquid Penetrant Test: Liquid Penetrant Test, Basic Concepts | 26/04/21 | Lecture interspersed with discussions |
| 25 | Principle of LPT | 27/04/21 | |
| 26 | Liquid Penetrant System | 28/04/21 | |
| 27 | Test Procedure | 28/04/21 | |
| 28 | Test Procedure | 29/04/21 | |
| 29 | Effectiveness and Limitations of Liquid Penetrant Testing | 30/04/21 | |
| 30 | Eddy Current Test: Principle of Eddy Current testing | 03/05/21 | |
| 31 | Eddy Current Test System | 04/05/21 | |
| 32 | Applications of Eddy Current Testing | 05/05/21 | |
| 33 | Effectiveness of Eddy Current Testing | 06/05/21 | |
| 34 | Limitations of Eddy Current Testing | 07/05/21 | |
| UNIT-IV MAGNETIC PARTICLE TEST | | | |
| CO4: Able to understand the concept of Magnetic particle test, test procedure & to interpret the various surface & sub-surface flaws | | | |
| TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair | | | |
| 35 | Magnetic Particle Test: Magnetic Materials, | 13/05/21 | Lecture interspersed with discussions |
| 36 | Magnetization of Materials | 17/05/21 | |
| 37 | Demagnetization of Materials | 18/05/21 | |
| 38 | Principle of Magnetic Particle Test | 19/05/21 | |
| 39 | Magnetic Particle Test Equipment | 20/05/21 | |
| 40 | Magnetic Particle Test Procedure | 21/05/21 | |
| 41 | Standardization and Calibration | 24/05/21 | |
| 42 | Interpretation and Evaluation | 25/05/21 | |
| 43 | Effective and Limitations of the Magnetic Particle Test | 26/05/21 | |
| UNIT-V INFRARED AND THERMAL TESTING | | | |
| CO5: Able to understand the fundamentals to infrared & thermal testing, contact & non-contact thermal inspection methods, infrared detectors, thermo mechanical behavior of materials–IR imaging in aerospace applications, electronic components, Honey comb and sandwich structures. | | | |
| TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair | | | |
| Non-Destructive testing of materials- Dr. V. Jayakumar & Dr. K. Elangovan | | | |
| 44 | Infrared And Thermal Testing Introduction and fundamentals to infrared and thermal testing | 27/05/21 | |
| 45 | Heat transfer | 28/05/21 | |
| 46 | Active and passive techniques | 31/05/21 | |
| 47 | Lock in and pulse thermography | 01/06/21 | |

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|----|--|----------|---------------------------------------|
| 48 | Contact thermal inspection methods | 02/06/21 | Lecture interspersed with discussions |
| 49 | Non -contact thermal inspection methods | 03/06/21 | |
| 50 | Heat sensitive paints –Heat sensitive papers | 04/06/21 | |
| 51 | thermally quenched phosphors liquid crystals | 07/06/21 | |
| 52 | techniques for applying liquid crystals | 08/06/21 | |
| 53 | other temperature sensitive coatings | 09/06/21 | |
| 54 | Infrared radiation and infrared detectors | 10/06/21 | |
| 55 | thermo mechanical behaviour of materials | 11/06/21 | |
| 56 | IR imaging in aerospace applications | 14/06/21 | |
| 57 | electronic components | 15/06/21 | |
| 58 | Honey comb and sandwich structures | 16/06/21 | |
| 59 | Case studies | 17/06/21 | |

UNIT-VI INDUSTRIAL APPLICATIONS OF NDE

CO6: Able to understand and select the appropriate NDE method based on the application.

TB: Non-destructive test and evaluation of materials- J Prasad, GCK Nair

| | | | |
|----|---|----------|---------------------------------------|
| 60 | Industrial Applications of NDE: Span of NDE Activities Railways | 18/06/21 | Lecture interspersed with discussions |
| 61 | Nuclear | 21/06/21 | |
| 62 | Non-nuclear | 22/06/21 | |
| 63 | Chemical Industries | 23/06/21 | |
| 64 | Aircraft and Aerospace Industries | 24/06/21 | |
| 65 | Automotive Industries | 25/06/21 | |
| 66 | Offshore Gas and Petroleum Projects | 28/06/21 | |
| 67 | Coal Mining Industry | 29/06/21 | |
| 68 | NDE of pressure vessels | 30/06/21 | |
| 69 | Castings, welded constructions | 30/06/21 | |

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P. O. S. N. R.
Signature of HOD

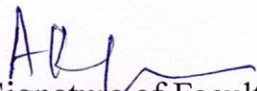
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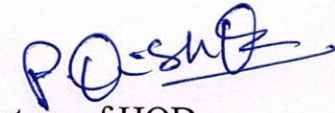
TENTATIVE LESSON PLAN: R164203C
QUALITY & RELIABILITY ENGINEERING

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|--|---|------------------------------|---------------------------------------|
| Course Title: Quality and Reliability Engineering | | Course code: R164203C | |
| Section : Sec A | Date :22/03/2021 | Page No : 01 to 03 | |
| Revision No : 00 | Prepared By:A.STANLY KUMAR | Approved By : HOD | |
| Tools: BLACK BOARD | | | |
| No. of Periods | TOPIC | Date | Mode of Delivery |
| UNIT-I Quality value and engineering – quality systems CO1: Students will get an idea about Quality value and engineering – quality systems TB:. Quality Engineering in Production Systems / G Taguchi /McGraw Hill | | | |
| 1 | Quality value and engineering | 22/03/21 | Lecture interspersed with discussions |
| 2 | Quality systems | 23/03/21 | |
| 3 | Quality engineering in product design | 23/03/21 | |
| 4 | Production process | 24/03/21 | |
| 5 | System design | 24/03/21 | |
| 6 | Parameter design | 25/03/21 | |
| 7 | Tolerance design | 26/03/21 | |
| 8 | Quality costs | 30/03/21 | |
| 9 | Quality improvement. | 31/03/21 | |
| UNIT-II Statistical process control X , R, p, c charts, other types of control charts. CO2: Student able to know the different Statistical process control X , R, p, c charts, other types of control charts TB . Statistical Quality Control : A Modern Introduction/ Montgomery/Wiley | | | |
| 10 | Statistical process control | 05/04/21 | Lecture interspersed with discussions |
| 11 | X , R, charts | 05/04/21 | |
| 12 | P, C charts | 06/04/21 | |
| 13 | Other types of control charts | 07/04/21 | |
| 14 | Process capability | 08/04/21 | |
| 15 | Process capability analysis | 09/04/21 | |
| 16 | Process capability index | 12/04/21 | |
| 17 | Problems | 15/04/21 | |
| 18 | Problems | 16/04/21 | |
| UNIT-III Acceptance sampling by variables and attributes. O3: Able to learn about Acceptance sampling by variables and attributes TB: Statistical Quality Control : A Modern Introduction/ Montgomery/Wiley | | | |
| 19 | Acceptance sampling by variables and attributes | 26/04/21 | |
| 20 | Design of sampling plans | 27/04/21 | |
| 21 | Single sampling plans | 28/04/21 | |
| 22 | Double sampling plans | 28/04/21 | |

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| 23 | Sequential sampling plans | 29/04/21 | Lecture interspersed with discussions |
| 24 | Continuous sampling plans | 30/04/21 | |
| 25 | Design of various sampling plans. | 03/05/21 | |
| 26 | Problems | 04/05/21 | |
| 30 | Problems | 05/05/21 | |
| 31 | Problems | 06/05/21 | |
| 32 | Problems | 07/05/21 | |
| UNIT-IV Loss function, tolerance design – N type, L type, S type. CO4: Gained knowledge about Loss function, tolerance design – N type, L type, S type. TB : Quality Engineering in Production Systems / G Taguchi / McGraw Hill | | | |
| 30 | Loss function, | 13/05/21 | Lecture interspersed with discussions |
| 31 | Tolerance design | 17/05/21 | |
| 32 | N type, L type, S type | 18/05/21 | |
| 33 | Determination of tolerance for these types | 19/05/21 | |
| 34 | Online quality control | 20/05/21 | |
| 35 | Variable characteristics | 21/05/21 | |
| | Attribute characteristics | 24/05/21 | |
| | Parameter design. | 25/05/21 | |
| | Quality function deployment | 26/05/21 | |
| | House of quality | 27/05/21 | |
| | QFD matrix | 28/05/21 | |
| | Total quality management concepts | 28/05/21 | |
| | Quality information systems | 30/05/21 | |
| | Quality circles | 31/05/21 | |
| UNIT-V Reliability – Evaluation of design by tests. CO5: Students are able to understand Reliability – Evaluation of design by tests. TB : Reliability Engineering/ E.Bala Guruswamy/Tata McGraw Hill | | | |
| 36 | Reliability | 01/06/21 | Lecture interspersed with discussions |
| 37 | Evaluation of design by tests | 02/06/21 | |
| 38 | Hazard Models, Linear, Releigh, Weibull | 03/06/21 | |
| 39 | Failure Data Analysis | 04/06/21 | |
| 40 | reliability prediction based on weibull distribution | 07/06/21 | |
| 41 | Reliability improvement | 08/06/21 | |
| 42 | | 09/06/21 | |
| 43 | | 10/06/21 | |
| UNIT-VI Complex system,. CO6: Able to know the Complex system,. TB : Reliability Engineering/ E.Bala Guruswamy/Tata McGraw Hill | | | |
| 44 | Complex system | 18/06/21 | Lecture interspersed with |
| 45 | Reliability of series, parallel & standby systems | 21/06/21 | |

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| 46 | Reliability of series, parallel & standby systems | 22/06/21 | discussions |
| 47 | Reliability prediction and system effectiveness | 23/06/21 | |
| 48 | Maintainability, availability | 24/06/21 | |
| 49 | Economics of reliability engineering | 25/06/21 | |
| 50 | Replacement of items, | 28/06/21 | |
| 51 | Maintenance costing and budgeting | 29/06/21 | |
| 52 | Reliability testing | 30/06/21 | |


 Signature of Faculty
 24/6/21


 Signature of HOD



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