

Discipline
Mechanical
Engineering

3rd Semester

Name Of The Faculty SRI SANTOSH KUMAR SAHU (PTGF, MECH)

Subject : Production
Technology No of Days per week
class allotted (4 nos)

Semester from 01/08/2023

Week	Class days	Theory Topic
1st	1st	Extrusion Definition & Classification
	2nd	Explain direct, indirect and impact extrusion process
	3rd	Define rolling Classify it
	4th	Differentiate between cold rolling and hot rolling process
2nd	1st	Define welding and classify various welding processes
	2nd	Explain fluxes used in welding
	3rd	Explain Oxy-acetylene welding process
	4th	Explain various types of flames used in Oxy-acetylene welding process
3rd	1st	Explain Arc welding process
	2nd	Specify arc welding electrodes
	3rd	Define resistance welding and classify it
	4th	Describe various resistance welding processes such as butt welding, spot welding flash welding, projection welding and seam welding
4th	1st	Explain TIG and MIG welding process
	2nd	Explain MIG welding Process
	3rd	Difference between TIG & MIG
	4th	Advantages & Disadvantages of TIG
5th	1st	Advantages & Disadvantages of MIG
	2nd	State different welding defects with causes and remedies
	3rd	Define Casting and Classify the various Casting processes
	4th	Explain the procedure of Sand mould casting
6th	1st	Explain different types of molding sands with their composition
	2nd	Properties of different types of molding sands
	3rd	Classify different pattern and state various pattern allowances
	4th	Classify core
7th	1st	Describe construction of cupola furnace
	2nd	Working of cupola furnace
	3rd	Construction of Crucible furnace
	4th	Working of Crucible furnace
8th	1st	Explain die casting method
	2nd	Explain centrifugal casting such as true centrifugal casting, centrifuging
	3rd	Advantages of centrifugal casting
	4th	Limitation of Centrifugal casting
9th	1st	Explain various casting defects with their causes and remedies
	2nd	Define powder metallurgy process
	3rd	State advantages of powder metallurgy
	4th	Powder metallurgy techniques
10th	1st	Describe the methods of producing components by powder metallurgy technique
	2nd	Explain sintering
	3rd	Economics of powder metallurgy
	4th	Describe Press Works
11th	1st	blanking, piercing and trimming
	2nd	List various types of die and punch
	3rd	Explain simple, Compound & Progressive dies
	4th	Describe the various advantages of dies
12th	1st	Describe the various disadvantages of above dies
	2nd	Define jigs and fixtures
	3rd	State advantages of using jigs and fixtures
	4th	State the principle of locations
13th	1st	Describe the methods of location with respect to 3-2-1 point location of rectangular jig
	2nd	List various types of jig and fixtures
	3rd	
	4th	

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3rd Semester

Name Of The Faculty-SRI BIPIN KUMAR DASH(SR.LECT ,MECH)

Subject : Strength Of
Material

Semester from 01/08/2023

Week	Class days	Theory Topic
1st	1st 2nd 3rd 4th	Types of load, stresses & strains,(Axial and tangential) Hooke's law, Young's modulus bulk modulus, modulus of rigidity, Poisson's ratio
2nd	1st 2nd 3rd 4th	Derive the relation between three elastic constants, Principle of super position, stresses in composite section Temperature stress, determine the temperature stress in composite bar
3rd	1st 2nd 3rd 4th	Strain energy and resilience, Stress due to gradually applied Strain energy due to suddenly applied and impact load Simple problems on above
4th	1st 2nd 3rd 4th	Definition of hoop and longitudinal stress, strain Derivation of hoop stress, longitudinal stress Derivation of hoop strain, longitudinal strain and volumetric strain Computation of the change in length, diameter and volume
5th	1st 2nd 3rd 4th	Simple problems on above Determination of normal stress, shear stress Resultant of normal stress and shear stress on oblique plane Location of principal plane through formula Computation of principal stress through formula Introduction to Mohr's circle Location of principal plane with the help of Mohr's circle Computation of principal stress with the help of Mohr's circle
6th	1st 2nd 3rd 4th	Maximum shear stress using Mohr's circle Solve Numericals on above by conventional method Solve numericals on above by Mohr's circle Types of beam and load

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1st	Concepts of Shear force
2nd	Concept of Bending Moment
3rd	Shear force Diagram
4th	Bending moment Diagram
1st	Shear Force and Bending moment diagram salient features
2nd	illustration in cantilever beam under point load and UDL
3rd	Illustration in simply supported beam under point load and UDL
4th	Illustration in over hanging beam under point load and UDL
1st	Solve Numericals on above
2nd	Solve Numericals on above
3rd	Assumptions in the theory of bending
4th	Bending equation
1st	Moment of resistance
2nd	Section modulus
3rd	Neutral axis
4th	Centroidal axis
1st	Difference between Neutral axis and Centroidal axis
2nd	Calculation of section Modulus and polar modulus
3rd	Solve numericals on above
4th	Define column
1st	Axial load, Eccentric load on column.
2nd	Direct stresses, Bending stresses
3rd	Maximum & Minimum stresses
4th	Numerical problems on above
1st	Buckling load computation using Euler's formula in columns with various end conditions
2nd	Assumption of pure torsion
3rd	The torsion equation for solid and hollow circular shaft
4th	Comparison between solid and hollow shaft subjected to pure torsion

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14th 1st
2nd
3rd
4th
15th 1st
2nd
3rd
4th

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Name Of The Faculty-SRI SAGAR KUAMAR BEHERA(LECT. MECH)

Subject : Thermal
Engineering-I

Semester from 01/08/2023

No of Days per week
class allotted (4 nos)

Week	Class days	Theory Topic
1st	1st 2nd 3rd 4th	Introduction to Thermodynamics, System and Surrounding & Types of system Thermodynamic properties of a system Concept of Pressure, Volume, Temperature & Entropy
2nd	1st 2nd 3rd 4th	Concept of Enthalpy, Internal energy and Units of measurement Intensive & Extensive properties Thermodynamic-processes, path & cycle Concept of State, path function & point function Thermodynamic Equilibrium & Quasi-static Process
3rd	1st 2nd 3rd 4th	Conceptual explanation of energy and its sources Work, heat and comparison between the two Mechanical Equivalent of Heat Work transfer, Displacement work Zeroth law of thermodynamics
4th	1st 2nd 3rd 4th	First law of Thermodynamics for a closed system undergoing a cycle First law of Thermodynamics for a closed system undergoing a change of state Consequences of first law of thermodynamics & PMM-1 Concept of Flow work
5th	1st 2nd 3rd 4th	Derivation of Steady Flow energy equation Application of First law of Thermodynamics to Turbine & Compressor Limitations of First law of thermodynamics
6th	1st 2nd 3rd 4th 1st	Introduction to second law of thermodynamics, Thermal energy Reservoir & heat engine Clausius statement & Kelvin Plank statement calculation of C.O.P of heat engine, heat pump & refrigerator Problem solving Boyle's law, Charles's law, Avogadro's law

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7th	2nd	Dalton's law of partial pressure, Guy lussac law
	3rd	Problem solving
	4th	General gas equation, characteristic gas constant, Universal gas constant
	1st	specific heat of gas (Cp and Cv) & Relation between them.
8th	2nd	<u>Enthalpy of a gas</u>
	3rd	Work done during a non-flow process
	4th	Application of first law of thermodynamics to Isothermal process & Isobaric process
	1st	Application of first law of thermodynamics to Isentropic process & Polytropic process
9th	2nd	Free expansion & throttling process
	3rd	Concept of I.C engine & its Classification
	4th	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM
	1st	Working principle of 2-stroke SI engine
10th	2nd	Working principle of 2-stroke CI engine
	3rd	Working principle of 4-stroke SI Engine
	4th	Working principle of 4-stroke CI Engine
	1st	Comparison between 2-stroke CI & SI engine
11th	2nd	Comparison between 4-stroke CI & SI engine
	3rd	Carnot cycle
	4th	Problem solving
	1st	Otto cycle
12th	2nd	Problem solving
	3rd	Diesel cycle
	4th	Problem solving
	1st	Problem solving
13th	2nd	Dual cycle
	3rd	Problem solving
	4th	Problem solving
	1st	Fuel & its Types
14th	2nd	Application of different types of fuel
	3rd	Heating values of fuel
	4th	Quality of I.C engine fuels
	1st	Octane number
	2nd	Cetane number

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Prabhu
 01/08/2023

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3rd Semester

Name Of The Faculty-SRI SAKTI RANJAN BHUYAN(SR.LECT,MECH)

Subject : Engineering Materials
No of Days per week class allotted (4 nos)

Semester from 01/08/2023

Week	Class days	Theory Topic
1st	1st	Material classification into ferrous and non ferrous category and alloys
	2nd	Properties of Materials: Physical , Chemical and Mechanical
	3rd	Performance requirements
	4th	Material reliability and safety
2nd	1st	Characteristics of ferrous materials
	2nd	Application of ferrous materials
	3rd	Classification, composition and application of low carbon steel
	4th	Classification, composition and application of medium carbon steel
3rd	1st	Classification, composition and application of high carbon steel
	2nd	Alloy steel: Low alloy steel, high alloy steel, tool steel and stainless steel
	3rd	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo
	4th	Introduction to Iron Carbon Diagram
4th	1st	Concept of phase diagram
	2nd	Cooling curve
	3rd	Features of Iron-Carbon diagram
	4th	Formation of alpha ferrite
5th	1st	Formation of Gamma Austenite
	2nd	Formation of delta ferrite
	3rd	Explain TTT curve
	4th	Explain Eutectoid, Eutectic and Peritectic Points
6th	1st	Explain the procedure of Sand mould casting
	2nd	Crystal defines, classification of crystals,
	3rd	ideal crystal and crystal imperfections
	4th	Classification of imperfection: Point defects, line defects



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7th	1st	surface defects and volume defects
	2nd	Types and causes of point defects: Vacancies, Interstitials and impurities
	3rd	Types and causes of line defects: Edge dislocation and screw dislocation
	4th	Effect of imperfection on material properties
8th	1st	Deformation by slip and twinning
	2nd	Effect of deformation on material properties
	3rd	Purpose of Heat treatment
	4th	Process of heat treatment: Annealing, normalizing, hardening, tempering, stress relieving measures
9th	1st	Surface hardening: Carburizing and Nitriding
	2nd	Effect of heat treatment on properties of steel
	3rd	Hardenability of steel
	4th	Hardenability of steel
10th	1st	Aluminum alloys: Composition, property and usage of Duralmin, y- alloy
	2nd	Copper alloys: Composition, property and usage of Copper- Aluminum, Copper-Tin
	3rd	Babbitt, Phosperous bronze, brass, Copper- Nickel
	4th	Predominating elements of lead alloys, Zinc alloys and Nickel alloys
11th	1st	Low alloy materials like P-91, P-22 for power plants and other high temperature services
	2nd	High alloy materials like stainless steel grades of duplex, super duplex materials etc
	3rd	Classification, composition, properties and uses of bearing materials
	4th	Bearing of Copper base, Tin Base, Lead base, Cadmium base materials
	1st	Classification, composition, properties and uses of spring material
12th	2nd	Spring of Iron- base and Copper base materials
	3rd	Properties and application of thermosetting and thermoplastic polymers
	4th	Properties of elastomers
	1st	Classification, composition, properties and uses of reinforced composites
13th	2nd	Reinforced of particulate based and fiber based materials
	3rd	Classification and uses of ceramics
	4th	

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 --(S.R. Bhargava)

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