Discipline Mechanical Engineering	3rd Semester	Name Of The Faculty :- Sri Manoj Kumar Das
Subject : Production Technology	No of Days per week class alloted (4 nos)	Semester from 01/09/2020
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
4th	1st	flash welding, projection welding and seam welding
	2nd	Explain TIG and MIG welding process
	3rd	Explain MIG welding Process
	4th	Difference between TIG & MIG
5th	1st	Advantages & Disadvantages of TIG
	2nd	Advantages & Disadvantages of MIG
	3rd	State different welding defects with causes and remedies
	4th	Define Casting and Classify the various Casting processes
6th	1st	Explain the procedure of Sand mould casting
	2nd	Explain different types of molding sands with their composition
	3rd	Properties of different types of molding sands
	4th	Classify different pattern and state various pattern allowances

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7th	1st	Classify core.
	2nd	Describe construction of cupola furnace
	3rd	Working of cupola furnace
	4th	Construction of Crucible furnace
8th	1st	Working of Crucible furnace
	2nd	Explain die casting method
	3rd	Explain centrifugal casting such as true centrifugal casting, centrifuging
	4th	Advantages of centrifugal casting
9th	1st	Limitation of Centrifugal casting
	2nd	Explain various casting defects with their causes and remedies
	3rd	Define powder metallurgy process
	4th	State advantages of powder metallurgy
10th	1st	Powder metallurgy techniques
	2nd	Describe the methods of producing components by powder metallurgy technique
	3rd	Explain sintering
	4th	Economics of powder metallurgy
11th	1st	Describe Press Works
	2nd	blanking, piercing and trimming
	3rd	List various types of die and punch
	4th	Explain simple, Compound & Progressive dies
12th	1st	Describe the various advantages of dies
	2nd	Describe the various disadvantages of above dies
	3rd	Define jigs and fixtures
	4th	State advantages of using jigs and fixtures
13th	1st	State the principle of locations
	2nd	Describe the methods of location with respect to 3-2-1 point location of rectangular jig
	3rd	List various types of jig and fixtures.
	4th	Revision

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Discipline Mechanical Engineering	3rd Semester	Name Of The Faculty : SR. Blpin Kumar Dash
Subject : Strength Of Material	No of Days per week class alloted (4 nos)	Semester from 01/09/2020

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

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Week	Period	Topic
7th	1st	Concepts of Shear force
	2nd	Concept of Bending Moment
	3rd	Shear force Diagram
	4th	Bending moment Diagram
8th	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
9th	1st	Solve Numericals on above
	2nd	Solve Numericals on above
	3rd	Assumptions in the theory of bending
	4th	Bending equation
10th	1st	Moment of resistance
	2nd	Section modulus
	3rd	Neutral axis
	4th	Centroidal axis
11th	1st	Difference between Neutral axis and Centroidal axis
	2nd	Calculation of section Modulus and polar modulus
	3rd	Solve numericals on above
	4th	Define column
12th	1st	Axial load, Eccentric load on column,
	2nd	Direct stresses, Bending stresses
	3rd	Maximum& Minimum stresses
	4th	Numerical problems on above
13th	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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Discipline Mechanical Engineering	3rd Semester	Name Of The Faculty : Sri Sakti Ranjan Bhupa
Subject : Engineering Materials	No of Days per week class alloted (4 nos)	Semester from 01/09/2020

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,	
9th	1st	hardening, tampering, stress relieving measures	
	2nd	Surface hardening: Carburizing and Nitriding	
	3rd	Effect of heat treatment on properties 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	Babbit , 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	
12th	1st	Classification, composition, properties and uses of spring material	
	2nd	Spring of Iron- base and Copper base materials	
	3rd	Properties and application of thermosetting and thermoplastic polymers	
	4th	Properties of elastomers	
13th	1st	Classification, composition, properties and uses of reinforced composites	
	2nd	Reinforced of particulate based and fiber based materials	
	3rd	Classification and uses of ceramics	
	4th		

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Discipline Mechanical Engineering	3rd Semester	Name Of The Faculty : Sri Sagar Kumar Behera.
Subject : Thermal Engineering-I	No of Days per week class alloted (4 nos)	Semester from 01/09/2020

Week	Class days	Theory Topic
1st	1st	Introduction to Thermodynamics, System and Surrounding & Types of system
	2nd	Thermodynamic properties of a system
	3rd	Concept of Pressure, Volume, Temperature &Entropy
	4th	Concept of Enthalpy, Internal energy and Units of measurement
2nd	1st	Intensive & Extensive properties
	2nd	Thermodynamic processes, path & cycle
	3rd	Concept of State,path function & point function
	4th	Thermodynamic Equillibrium &Quasi-static Process
3rd	1st	Conceptual explanation of energy and its sources
	2nd	Work , heat and comparison between the two
	3rd	Mechanical Equivalent of Heat
	4th	Work transfer, Displacement work
4th	1st	Zeroth law of thermodynamics
	2nd	First law of Thermodynamics for a closed system undergoing a cycle
	3rd	First law of Thermodynamics for a closed system undergoing a change of state
	4th	Consequences of first law of thermodynamics & PMM-1
5th	1st	Concept of Flow work
	2nd	Derivation of Steady Flow energy equation
	3rd	Application of First law of Thermodynamics to Turbine & Compressor
	4th	Limitations of First law of thermodynamics
6th	1st	Introduction to second law of thermodynamics,Thermal energy Reservoir & heat engine
	2nd	Clausius statement & Kelvin Plank statement
	3rd	calculation of C.O.P of heat engine,heat pump & refrigerator
	4th	Problem solving
	1st	Boy le's law, Charle'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
8th	1st	specific heat of gas (Cp and Cv) & Relation between them.
	2nd	Enthalpy of a gas
	3rd	Work done during a non- flow process
	4th	Application of first law of thermodynamics to Isothermal process & Isobaric process
9th	1st	Application of first law of thermodynamics to Isentropic process &Polytropic process
	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
10th	1st	Working principle of 2-stroke SI engine
	2nd	Working principle of 2-stroke CI engine
	3rd	Working principle of 4-stroke SI Engine
	4th	Working principle of 4-stroke CI Engine
11th	1st	Comparision between 2-stroke CI & SI engine
	2nd	Comparision between 4-stroke CI & SI engine
	3rd	Carnot cycle
	4th	Problem solving
12th	1st	Otto cycle
	2nd	Problem solving
	3rd	Diesel cycle
	4th	Problem solving
13th	1st	Problem solving
	2nd	Dual cycle
	3rd	Problem solving
	4th	Problem solving
14th	1st	Fuel & its Types
	2nd	Application of different types of fuel
	3rd	Heating values of fuel
	4TH	Quality of I.C engine fuels
15TH	1st	Octane number
	2nd	Cetane number
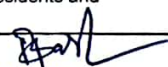
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LESSON PLAN FOR ENVIRONMENTAL STUDIES(TH- 5)(2020-21), 3rd Semester
COURSE DURATION : 01/09/2020 TO 19/03/2021, (Duration of Each Period : 55 minutes)

Week	Period	Unit	Subject	Topics to be Covered
1st	Period-1	I	The Multidisciplinary nature of environmental studies	Introduction
	Period-2			Definition, scope and importance
	Period-3			Need for public awareness
	Period-4			Unit test- I and Doubt Solving
2nd	Period-5	II	Natural Resources	Renewable and non renewable resources: a) Natural resources and associated problems
	Period-6			Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction mining, dams and their effects on forests and tribal people
	Period-7			Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems
	Period-8			Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources
3rd	Period-9			Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity
	Period-10			Energy Resources: Growing energy need, renewable and nonrenewable energy sources, use of alternate energy sources, case studies
	Period-11			Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, anddesertification
	Period-12			Role of individual in conservation of natural resources
	Period-13			Equitable use of resources for sustainable life styles
4th	Period-14			Unit test- II and Doubt Solving
	Period-15	III	Ecosystems	Concept of an eco system, Structure and function of an eco system
	Period-16			Producers, consumers,decomposers
	Period-17			Energy flow in the eco systems
5th	Period-18			Food chains, food webs and ecological pyramids
	Period-19			Introduction, types, characteristic features, structure and function of the following eco system: Forest ecosystem
	Period-20			Aquatic eco systems (ponds, streams, lakes)
	Period-21			Aquatic eco systems (rivers, oceans, estuaries)
6th	Period-22			Unit test- III and Doubt Solving
	Period-23	IV	Biodiversity and it's Conservation	Introduction-Definition
	Period-24			genetics, species and ecosystem diversity
	Period-25			Biogeographically classification of India
7th	Period-26			Value of biodiversity: consumptive use, productive use
	Period-27			Value of biodiversity: social ethical, aesthetic and optin values
	Period-28			Biodiversity at global, national and local level
	Period-29			Threats to biodiversity: Habitats loss, poaching of wild life, man wildlife conflicts
8th	Period-30			Unit test- IV and Doubt Solving
	Period-31	V	Environmental Pollution	Definition Causes, effects
	Period-32			control measures of: a) Air pollution
	Period-33			b) Water pollution
9th	Period-34			c) Soil pollution
	Period-35			d) Marine pollution
	Period-36			e) Noise pollution
	Period-37			f) Thermal pollution
10th	Period-38			g) Nuclear hazards
	Period-39			Solid waste Management: Causes, effects and control measures of urban and industrial wastes
	Period-40			Role of an individual in prevention of pollution
11th	Period-41			Disaster management: Floods, earth quake, cyclone and landslides
	Period-42			Unit test- V and Doubt Solving
	Period-43	VI	Social issues and the Environment	Form unsustainable to sustainable development
	Period-44			Urban problems related to energy
12th	Period-45			Water conservation, rain water harvesting, water shed management
	Period-46			Resettlement and rehabilitation of people; its problems and concern
	Period-47			Environmental ethics: issue and possible solutions
	Period-48			Climatechange, globalwarming,acidrain,ozonelayerdepletion, nuclear accidents and holocaust, case studies

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				Air (prevention and control of pollution) Act
13th	Period-49			
	Period-50			Water (prevention and control of pollution) Act
	Period-51			Public awareness
	Period-52			Unit test- VI and Doubt Solving
14th	Period-53	VII	Human population and the environment	Population growth and variation among nations
	Period-54			Population explosion- family welfare program
	Period-55			Environment and humanhealth
	Period-56			Human rights
15th	Period-57			Value education
	Period-58			Role of information technology in environment and human health
	Period-59			Unit test- VII and Doubt Solving
16th	Period-60			Revision Class
	Period-61			Revision Class
	Period-62			Mock Test

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