

Vedang Institute of Technology

Lesson Plan

Discipline: MECHANICAL ENGG.	Semester:3RD	Name of the Teaching Faculty: Omm Prakash Kar
Subject: Engineering Material	No. of Days/ Per Week Class Allotted:04	Semester From date: 01/08/2023 To Date: 30/11/2023
Week	Class Day	No. of Weeks: 15 Week
1ST	1st	Theory Topics
	2nd	ENGINEERING MATERIALS AND THEIR PROPERTIES
	3rd	Material classification into ferrous and non ferrous category and alloys
	4th	Properties of Materials: Physical, Chemical and Mechanical
2ND	1st	Performance requirements
	2nd	Material reliability and safety
	3rd	FERROUS MATERIAL AND ALLOY
	4th	Characteristics and application of ferrous materials
3RD	1st	Classification, composition and application of low carbon steel, medium carbon steel and 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	IRO- CARBON SYSTEM
4TH	1st	Concept of phase diagram and cooling curves
	2nd	Concept of phase diagram and cooling curves
	3rd	Concept of phase diagram and cooling curves
	4th	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
5TH	1st	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
	2nd	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
	3rd	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
	4th	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
6TH	1st	CRYSTAL IMPERFECTIONS
	2nd	Crustal defines, classification of crystals, ideal crystal and crystal imperfections
	3rd	classification of imperfection: Point defects, line defects, surface defects and volume defects
	4th	classification of imperfection: Point defects, line defects, surface defects and volume defects
7TH	1st	Types and causes of point defects: Vacancies, Interstitials and impurities
	2nd	Types and causes of line defects: Edge dislocation and screw dislocation
		Effect of imperfection on material properties

	3 rd	Deformation by slip and twinning
	4 th	Effect of deformation on material properties
8TH	1 st	Effect of deformation on material properties
	2 nd	HEAT TREATMENT
	3 rd	Purpose of Heat treatment
	4 th	Process of Heat treatment: Annealing, normalizing, hardening, tempering, stress relieving measures
	4 th	Process of Heat treatment: Annealing, normalizing, hardening, tempering, stress relieving measures
9TH	1 st	Process of Heat treatment: Annealing, normalizing, hardening, tempering, stress relieving measures
	2 nd	Process of Heat treatment: Annealing, normalizing, hardening, tempering, stress relieving measures
	3 rd	Surface Hardening: Carburizing and Nitriding
	4 th	Surface Hardening: Carburizing and Nitriding
10TH	1 st	Effect of heat treatment on properties of steel
	2 nd	Hardenability of steel
	3 rd	NON-FERROUS ALLOYS
	4 th	Aluminum alloys: composition, property and usage of Duralmin, y-alloy.
11TH	1 st	Aluminum alloys: composition, property and usage of Duralmin, y-alloy.
	2 nd	Copper alloys: composition, property and usage of Copper-Aluminum, Copper-Tin, Babbit, Phosphorous bronze, brass, Copper-Nickel.
	3 rd	Copper alloys: composition, property and usage of Copper-Aluminum, Copper-Tin, Babbit, Phosphorous bronze, brass, Copper-Nickel
	4 th	Copper alloys: composition, property and usage of Copper-Aluminum, Copper-Tin, Babbit, Phosphorous bronze, brass, Copper-Nickel
12TH	1 st	Predominating elements of lead alloys, Zinc alloys and Nickel alloys
	2 nd	Predominating elements of lead alloys, Zinc alloys and Nickel alloys
	3 rd	Low alloy materials like P-91, P-22 for power plants and other
	4 th	Low alloy materials like P-91, P-22 for power plants and other
13TH	1 st	BEARING MATERIAL
	2 nd	Classification, composition, properties and uses of Copper base, Tin Base, Lead base, Cadmium base bearing materials
	3 rd	Classification, composition, properties and uses of Copper base, Tin Base, Lead base, Cadmium base bearing materials
	4 th	SPRING MATERIALS
14TH	1 st	Classification, composition, properties and uses of Iron-base and Copper Base spring material
	2 nd	Classification, composition, properties and uses of Iron-base and Copper Base spring material
	3 rd	POLYMERS
	4 th	Properties and application of thermosetting and thermoplastic polymers
15TH	1 st	Properties of elastomers
	2 nd	COMPOSITES AND CERAMICS
	3 rd	Classification, composition, properties and uses of particulate based and fiber reinforced composites
	4 th	Classification and uses of ceramics

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Lesson Plan

Discipline: Mechanical Engineering	Semester: 3 rd	Name of the Teaching Faculty: Subhashree Sahoo
Subject: Environmental Studies	No. of Days/ Per Week Class Allotted: 05	Semester From Date: 01/08/2023 To Date: 30/11/2023 No of Weeks: 15
Week	Class Day	Theory Topics
1 st	1st	Multidisciplinary nature of environmental studies- Introduction
	2nd	Definition, Scope and Importance
	3rd	Need for public awareness
	4th	Doubt Clearing
	5th	Unit-2: Natural resources- Introduction, definition Associated problems
2 nd	1st	Forest Resources – Use & over exploitation, deforestation case studies
	2nd	Timber Extraction, mining, dams and their effects of forests and tribal people
	3rd	Water resources – use & over utilization of surface & ground water, floods, draught
	4th	Conflicts over water, dams benefits and problems
	5th	Mineral resources- use & exploitation, environmental effects of extracting and using mineral resources.
3 rd	1st	Food resources- World food problem, changes caused by agriculture and over grazing.
	2nd	Effects of modern agriculture, fertilizers & pesticide problems, water logging & salinity
	3rd	Energy resources- Growing energy need, Renewable & nonrenewable energy source, use of alternate energy sources
	4th	Case studies, Land resources- land as a resource, land de radiation, man induces landslides,
	5th	Soil erosion, desertification
4 th	1st	Role of individual in conservation of natural resources, suitable use of resources for sustainable life styles
	2nd	Unit-3- Ecosystem: concept of ecosystem, structure of eco system
	3rd	Function of eco system, Producers, consumers, decomposers
	4th	Enter flow in eco s stem ,eco logical succession
	5th	Food chain, food web, ecological pyramid
5 th	1st	Forest eco system - definition, types, characteristics
	2nd	Forest ecosystem- structure & function
	3rd	Pond ecosystem
	4th	Stream eco system
	5th	Lake ecosystem
6 th	1st	River ecosystem
	2nd	Ocean ecosystem
	3rd	Estuaries ecosystem

	4th	Unit -4- Biodiversity & its conservation: introduction, definition, genetics, species, and ecosystem diversity
	5th	Biogeographically classification of India
7 th	1st	Value of biodiversity
	2nd	Biodiversity at global level
	3rd	Biodiversity at national level
	4th	Habitat loss, poaching of wild life
	5th	Man wildlife conflicts
8 th	1st	Doubt clearing
	2nd	Unit-5- Environmental pollution: introduction, definition
	3rd	Air pollution
	4th	Control of air pollution
	5th	Water pollution
9 th	1st	Control of water pollution
	2nd	Soil pollution
	3rd	Marine pollution
	4th	Noise pollution
	5th	Thermal pollution
10 th	1st	Nuclear pollution
	2nd	Solid waste management- causes, effect
	3rd	Control measures
	4th	Waste management
	5th	Role of individual in prevention of pollution
11 th	1st	Flood management
	2nd	Earth quake magement
	3rd	Cyclone management
	4th	Landslides management
	5th	Unit-6- Social issues & the environment: From unsustainable to sustainable development, urban problems related to energy.
12 th	1st	Water conservation , rain water harvesting
	2nd	Water shed management, resettlement and rehabilitation of people; its problem and concern
	3rd	Environmental ethics: issue and possible solutions.
	4th	Climate change, global warming
	5th	Acid rain , ozone layer depletion,
13 th	1st	Nuclear accidents and holocaust,
	2nd	case studies
	3rd	Air (prevention and control of pollution) Act
	4th	Water (prevention and control of pollution) Act
	5th	Public awareness
14 th	1st	Doubt clearing
	2nd	Unit 7- Human population and the Environment: population growth and variation among nations (introduction)
	3rd	population growth and variation among nations
	4th	Population explosion, family welfare *roe ram
	5th	Environment and human health
15 th	1st	Human rights
	2nd	Value education
	3rd	Role of information technology in environment and human health
	4th	Doubt clearing, revision
	5th	Revision and Previous year question discussion

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Discipline:- Mechanical Engineering	Semester: 3 RD	Name of Teaching Faculty- Suchismita Mohanty
Subject: Strength of Materials	No. Of Day/Week Class allotted: 4P/Week	Semester From Date: 01/08/2023 To Date: 30/11/2023
Week	Class Day	Theory/Practical Topics
1st	1st	Simple Stress & Strain
	2nd	Types of load, stresses & strains (Axial and tangential) Hooke's law,
	3rd	Young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio
	4th	derive the relation between three elastic constants,
2nd	1st	Principle of super position, stresses in composite section,
	2nd	Temperature stress, determine the temperature stress in composite bar(Single core)
	3rd	Temperature stress, determine the temperature stress in composite bar(Single core)
	4th	Strain energy and resilience, Stress due to gradually applied
3rd	1st	Suddenly applied and impact load.
	2nd	Simple problems on above
	3rd	Thin cylinder and spherical shell under internal pressure
	4th	Definition of hoop and longitudinal stress, strain,
4th	1st	Derivation of hoop stress,
	2nd	longitudinal stress, hoop strain,
	3rd	longitudinal strain,
	4th	volumetric strain
5th	1st	Computation of the change in length, diameter and volume,
	2nd	Simple problems on above
	3rd	Two dimensional stress systems
	4th	Determination of normal stress
6th	1st	Shear stress and resultant stress on oblique plane
	2nd	Shear stress and resultant stress on oblique plane
	3rd	Location of principal plane and computation of principal stress
	4th	Location of principal plane and computation of principal stress
7th	1st	Location of principal plane
	2nd	computation of principal stress
	3rd	Maximum shear stress using Mohr's circle
	4th	Problems
8th	1st	Bending moment & shear force
	2nd	Types of beam and load
	3rd	Concepts of Shear force and bending moment
	4th	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam
9th	1st	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam
	2nd	simply supported beam and over hanging beam under point load

	3rd	simply supported beam and over hanging beam under point load
	4th	Uniformly distributed load
10th	1st	Problems
	2nd	Problems
	3rd	Theory of simple bending
	4th	Assumptions in the theory of bending,
11th	1st	Bending equation
	2nd	Bending equation
	3rd	Moment of resistance
	4th	Section modulus,
12th	1st	Section modulus
	2nd	neutralaxis
	3rd	Solve simple problems
	4th	Solve simple problems
13th	1st	Combined bending & direct stress
	2nd	Define column, Axial load, Eccentric load on column,
	3rd	Direct stresses, Bending stresses,
	4th	Maximum & Minimum stresses.
14th	1st	Numerical problems on above, Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	2nd	Numerical problems on above, Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	3rd	Torsion
	4th	Assumption of pure torsion
15th	1st	The torsion equation for solid and hollow circular shaft
	2nd	Comparison between solid and hollow shaft subjected to pure torsion
	3rd	Comparison between solid and hollow shaft subjected to pure torsion
	4th	Simple problems

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Lesson Plan

Discipline: MECHANICAL ENGG.	Semester: 3 RD	Name of the Teaching Faculty: Omm Prakash Kar
Subject: Production Technology	No. of Days/perweek class allotted: 4P/W	Semester From date: 01/08/2023 To Date: 30/11/2023 No. of Weeks: 15 Week
Week	Class Day	Theory Topics
1ST	1 st	Metal Forming Processes:
	2 nd	Extrusion: Definition & Classification
	3 rd	Explain direct, indirect and impact extrusion process.
	4 th	Explain direct, indirect and impact extrusion process.
2ND	1 st	Define rolling. Classify it.
	2 nd	Differentiate between cold rolling and hot rolling process.
	3 rd	List the different types of rolling mills used in Rolling process.
	4 th	Welding:
3RD	1 st	Define welding and classify various welding processes.
	2 nd	Explain fluxes used in welding.
	3 rd	Explain Oxy-acetylene welding process.
	4 th	Explain various types of flames used in Oxy-acetylene welding process.
4TH	1 st	Explain Arc welding process.
	2 nd	Specify arc welding electrodes.
	3 rd	Define resistance welding and classify it.
	4 th	Describe various resistance welding processes such as butt welding, spot welding, flash welding, projection welding and seam welding.
5TH	1 st	Describe various resistance welding processes such as butt welding, spot welding, flash welding, projection welding and seam welding.
	2 nd	Describe various resistance welding processes such as butt welding, spot welding, flash welding, projection welding and seam welding.
	3 rd	Describe various resistance welding processes such as butt welding, spot welding, flash welding, projection welding and seam welding.
	4 th	Explain TIG and MIG welding process

6TH	1 st	Explain TIG and MIG welding process
	2 nd	State different welding defects with causes and remedies.
	3rd	State different welding defects with causes and remedies.
	4th	Casting
7TH	1st	Define Casting and Classify the various Casting processes.
	2nd	Explain the procedure of Sand mould casting.
	3rd	Explain the different type of molding sand with their composition and properties
	4th	Explain the different type of molding sand with their composition and properties
8TH	1st	Classify different pattern and state various pattern allowances.
	2nd	Classify different pattern and state various pattern allowances.
	3rd	Classify core.
	4th	Describe construction and working of cupola and crucible furnace.
9TH	1st	Describe construction and working of cupola and crucible furnace
	2nd	Explain die casting method.
	3rd	Explain centrifugal casting such as true centrifugal casting, centrifuging with advantages, limitation and area of principle.
	4th	Explain centrifugal casting such as true centrifugal casting, centrifuging with advantages, limitation and area of principle
10TH	1st	Explain centrifugal casting such as true centrifugal casting, centrifuging with advantages, limitation and area of principle
	2nd	Explain various casting defects with their causes and remedies.
	3rd	Explain various casting defects with their causes and remedies.
	4th	Powder Metallurgy:
11TH	1st	Define powder metallurgy process.

	2 nd	State advantages of powder metallurgy technology technique
	3 rd	Describe the methods of producing components by powder metallurgy technique
	4 th	Describe the methods of producing components by powder metallurgy technique
12TH	1 st	Explain sintering
	2 nd	Economics of powder metallurgy.
	3 rd	Press Work:
	4 th	Describe Press Works: blanking, piercing and trimming.
13TH	1 st	List various types of die and punch
	2 nd	Explain simple, Compound & Progressive dies
	3 rd	Explain simple, Compound & Progressive dies
	4 th	Describe the various advantages & disadvantages of above dies
14TH	1 st	Describe the various advantages & disadvantages of above dies
	2 nd	Jigs and fixtures
	3 rd	Define jigs and fixtures
	4 th	State advantages of using jigs and fixtures
15TH	1 st	State the principle of locations
	2 nd	Describe the methods of location with respect to 3-2-1 point location of rectangular jig
	3 rd	Describe the methods of location with respect to 3-2-1 point location of rectangular jig
	4 th	List various types of jig and fixtures.

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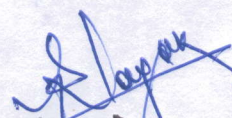
Lesson Plan

Discipline: Mechanical Engineering	Semester: 3 RD	Name of the Teaching Faculty: Soumya Ranjan Nayak
Subject: Thermal Engineering -I	No. of Days/perweek class allotted: 4P/W	Semester From date: 01/08/2023 To Date: 30/11/2023 No. of Weeks: 15 Week
Week	Class Day	Theory Topics
1ST	1 st	Thermodynamic concept & Terminology
	2 nd	Thermodynamic Systems (closed, open, isolated)
	3 rd	Thermodynamic properties of a system (pressure, volume, temperature
	4 th	entropy, enthalpy, Internal energy and units of measurement).
2ND	1 st	Intensive and extensive properties Define thermodynamic processes, path, cycle , state, path function, point function.
	2 nd	Thermodynamic Equilibrium. Quasi-static Process
	3 rd	Thermodynamic Equilibrium. Quasi-static Process
	4 th	Conceptual explanation of energy and its sources
3RD	1 st	Work , heat and comparison between the two. Mechanical Equivalent of Heat.
	2 nd	Work , heat and comparison between the two. Mechanical Equivalent of Heat
	3 rd	Work transfer, Displacement work
	4 th	Work transfer, Displacement work
4TH	1 st	Laws of Thermodynamics
	2 nd	State & explain Zeroth law of thermodynamics.
	3 rd	State & explain First law of thermodynamics. Limitations of First law of thermodynamics
	4 th	State & explain First law of thermodynamics. Limitations of First law of thermodynamics
5TH	1 st	Application of First law of Thermodynamics(steady flow energy equation and its application to turbine and compressor)
	2 nd	Application of First law of Thermodynamics(steady flow energy equation and its application to turbine and compressor)
	3 rd	Second law of thermodynamics (Clausius & Kelvin Planck statements).

	4 th	Second law of thermodynamics (Clausius & Kelvin Planck statements).
6TH	1 st	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
	2 nd	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & C.O.P
	3 rd	solve simple numerical
	4 th	solve simple numerical
7TH	1 st	Properties Processes of perfect gas
	2 nd	Laws of perfect gas, Boyle's law, Charle's law, Avogadro's law,
	3 rd	Dalton's law of partial pressure, Guy lussac law
	4 th	General gas equation, characteristic gas constant, Universal gas constant.
8TH	1 st	Explain specific heat of gas (Cp and Cv) Relation between Cp & Cv.
	2 nd	Enthalpy of a gas. Work done during a non- flow process.
	3 rd	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process)
	4 th	Solve simple problems on above.
9TH	1 st	Free expansion & throttling process.
	2 nd	Internal combustion engine
	3 rd	Explain & classify I.C engine.
	4 th	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.
10TH	1 st	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed & RPM.
	2 nd	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
	3 rd	Explain the working principle of 2-stroke & 4- stroke engine C.I & S.I engine.
	4 th	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
11TH	1 st	Differentiate between 2-stroke & 4- stroke engine C.I & S.I engine.
	2 nd	Gas Power Cycle
	3 rd	Carnot cycle
	4 th	Otto cycle.
12TH	1 st	Otto cycle
	2 nd	Diesel cycle.

13TH	3 rd	Diesel cycle.
	4 th	Dual cycle.
	1 st	Dual cycle.
	2 nd	Solve simple numerical
	3 rd	Solve simple numerical
14TH	4 th	Fuels and Combustion
	1 st	Define Fuel.Types of fuel
	2 nd	Application of different types of fuel.
	3 rd	Application of different types of fuel.
	4 th	Heating values of fuel
15TH	1 st	Heating values of fuel
	2 nd	Quality of I.C engine fuels Octane number, Cetane number
	3 rd	SOLVE PREVIOUS YEAR QUESTION
	4 th	SOLVE PREVIOUS YEAR QUESTION


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