Vedang Institute of Technology
Lesson Plan

Discipline: **MECHANICAL ENGG.**	Semester: **3rd**	Name of the Teaching Faculty: **Amruta Panda**
Subject: **Engineering Material**	**No. of Days/ Per Week Class Allotted:04**	**Semester Starts: 01/08/2023 Semester Ends: 30/11/2023** **No. of Weeks: 15 Week**
Week	**Class Day**	**Topics**
1ST	1st	**ENGINEERING MATERIALS AND THEIR PROPERTIES**
	2nd	Material classification into ferrous and nonferrous category and alloys
	3rd	Properties of Materials: Physical, Chemical and Mechanical
	4th	Performance requirements
2ND	1st	Material reliability and safety
	2nd	**FERROUS MATERIAL AND ALLOY**
	3rd	Characteristics and application of ferrous materials
	4th	Classification, composition and application of low carbon steel, medium carbon steel and High carbon steel
3RD	1st	Alloy steel: low alloy steel, high alloy steel, tool steel and stainless steel
	2nd	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo,
	3rd	**IRO- CARBON SYSTEM**
	4th	Concept of phase diagram and cooling curves
4TH	1st	Concept of phase diagram and cooling curves
	2nd	Concept of phase diagram and cooling curves
	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
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	**CRYSTAL IMPERFECTIONS**
6TH	1st	Crustal defines, classification of crystals, ideal crystal and crystal imperfections
	2nd	classification of imperfection: Point defects, line defects, surface defects and volume defects
	3rd	classification of imperfection: Point defects, line defects, surface defects and volume defects
	4th	Types and causes of point defects: Vacancies, Interstitials and impurities
7TH	1st	Types and causes of line defects: Edge dislocation and screw dislocation
	2nd	Effect of imperfection on material properties
	3rd	Deformation by slip and twinning
	4th	Effect of deformation on material properties

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

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Discipline: Mechanical Engineering	**Semester: 3rd**	**Name of the Teaching Faculty: Priyanka Barik**
Subject: Environmental Studies	**No. of Days/ Per Week Class Allotted:04**	**Semester From Date: 01/08/2023 To Date: 30/11/2023 No of Weeks: 15**
Week	**Class Day**	**Theory Topics**
1st	1st	Multidisciplinary nature of environmental studies- Introduction
	2nd	Definition, Scope and Importance
	3rd	Need for public awareness
	4th	Doubt Clearing
2nd	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
3rd	1st	Food resources- World food problem, changes caused by agriculture and over gazing.
	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,
4th	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 ecosystem ,ecological succession
5th	1st	Forest ecosystem - definition, types, characteristics
	2nd	Forest ecosystem- structure & function
	3rd	Pond ecosystem
	4th	Stream eco system
6th	1st	River ecosystem
	2nd	Ocean ecosystem
	3rd	Estuaries ecosystem
	4th	Unit -4- Biodiversity & its conservation: introduction, definition, genetics, species, and ecosystem diversity
7th	1st	Value of biodiversity
	2nd	Biodiversity at global level
	3rd	Biodiversity at national level
	4th	Habitat loss, poaching of wild life
8th	1st	Doubt clearing

	2nd	Unit-5- Environmental pollution: introduction, definition
	3rd	Air pollution
	4th	Control of air pollution
9th	1st	Control of water pollution
	2nd	Soil pollution
	3rd	Marine pollution
	4th	Noise pollution
10th	1st	Nuclear pollution
	2nd	Solid waste management- causes, effect
	3rd	Control measures
	4th	Waste management
11th	1st	Flood management
	2nd	Earth quake magement
	3rd	Cyclone management
	4th	Landslides management
12th	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
13th	1st	Nuclear accidents and holocaust,
	2nd	case studies
	3rd	Air (prevention and control of pollution) Act
	4th	Water (prevention and control of pollution) Act
14th	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
15th	1st	Human rights
	2nd	Value education
	3rd	Role of information technology in environment and human health
	4th	Doubt clearing, revision

Teaching Faculty **HOD**

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Discipline **Mechanical Engineering**	**Semester** **3rd**	**Name of the Teaching Faculty** **Samaresh Pratap Mohanty**
Subject **Production Technology**	**No. of days/Per weeks Class Allotted Weeks** **4P/W**	**Semester from date** **01.08.2023 to 30.11.2023** **No of Weeks - 15**
Weeks	**Class Period**	**Theory**
1st	1st	**Metal Forming Processes** Extrusion: Definition & Classification
	2nd	Explain direct, indirect extrusion process
	3rd	Impact extrusion process.
	4th	Define rolling. Classify it.
2nd	1st	Differentiate between cold rolling and hot rolling process.
	2nd	List the different types of rolling mills used in Rolling process.
	3rd	Doubt Clear Class
	4th	**Welding** Define welding and classify various welding processes.
3rd	1st	Explain fluxes used in welding.
	2nd	Explain Oxy-acetylene welding process.
	3rd	Explain Oxy-acetylene welding process.
	4th	Explain various types of flames used in Oxy-acetylene welding process.
4th	1st	Explain Arc welding process.
	2nd	Explain Arc welding process.
	3rd	Specify arc welding electrodes.
	4th	Define resistance welding and classify it.
5th	1st	Define resistance welding and classify it.
	2nd	butt welding, spot welding
	3rd	butt welding, spot welding
	4th	flash welding, projection welding and seam welding.
6th	1st	flash welding, projection welding and seam welding.
	2nd	Explain TIG and MIG welding process
	3rd	State different welding defects with causes and remedies.
	4th	State the common ignition troubles and its remedies
7th	1st	**Casting** Define Casting
	2nd	Classify the various Casting processes.
	3rd	Explain the procedure of Sand mould casting.
	4th	Explain different types of molding sands with their composition and properties.
8th	1st	Explain different types of molding sands with their composition and properties.
	2nd	Classify different pattern and state various pattern allowances.
	3rd	Classify different pattern and state various pattern allowances.
	4th	Classify core.
9th	1st	Describe construction and working of cupola and crucible furnace.
	2nd	Describe construction and working of cupola and crucible furnace.

	3rd	Explain die casting method.
	4th	Explain centrifugal casting such as true centrifugal casting, centrifuging with advantages, limitation and area of application.
10th	1st	Explain centrifugal casting such as true centrifugal casting, centrifuging with advantages, limitation and area of application.
	2nd	Explain various casting defects with their causes and remedies.
	3rd	Revision & Test
	4th	**Powder Metallurgy** Define powder metallurgy process.
11th	1st	State advantages of powder metallurgy technology technique
	2nd	Describe the methods of producing components by powder metallurgy technique.
	3rd	Describe the methods of producing components by powder metallurgy technique.
	4th	Explain sintering.
12th	1st	Economics of powder metallurgy.
	2nd	Doubt Clear Class
	3rd	**Press Work** Describe Press Works: blanking, piercing and trimming.
	4th	Describe Press Works: blanking, piercing and trimming
13th	1st	List various types of die and punch
	2nd	Explain simple, Compound & Progressive dies
	3rd	Explain simple, Compound & Progressive dies
	4th	Describe the various advantages & disadvantages of above dies
14th	1st	Describe the various advantages & disadvantages of above dies
	2nd	**Jigs and fixtures** Define jigs and fixtures
	3rd	State advantages of using jigs and fixtures
	4th	State the principle of locations
15th	1st	Describe the methods of location with respect to 3-2-1 point location of rectangular jig
	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 & Test

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

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

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

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