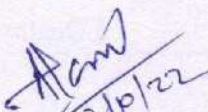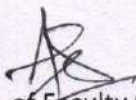# LESSON PLAN: TE-1 WINTER SEMESTER 2022
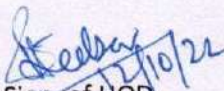
Discipline: **Mechanical Engineering**	Semester: 3rd Winter 2022	Name of the teaching faculty: **Aurobinda Biswas**
Subject: **Thermal Engineering-1**	No of days/per week class allotted: **04**	Semester From Date: **15/09/2022** To Date: **22/12/2022** No of weeks:**14**
Week:	Class day:	**Theory/practical topics:**
1st	1st	Thermodynamic Systems (closed, open, isolated).
	2nd	Thermodynamic properties of a system(pressure, volume, temperature.
	3rd	Entropy, enthalpy, Internal energy and unitsof measurement).
	4th	Intensive and extensive properties Define thermodynamicprocesses, path, cycle, state, path function, point function.
2nd	1st	Thermodynamic Equilibrium. Quasi-static Process.
	2nd	Conceptual explanation of energy and its sources.
	3rd	Work, heat and comparison between the two. MechanicalEquivalent of Heat.
	4th	Work transfer, Displacement work.
3rd	1st	State & explain Zeroth law of thermodynamics.
	2nd	State & explain First law of thermodynamics. Limitations of First law of thermodynamics.
	3rd	Application of Firstlaw of Thermodynamics (steadyflow energy equation and its application to turbine and compressor).
	4th	Second law of thermodynamics (Clausius & Kelvin Planck statements).
4th	1st	Application of second law in heat engine, heat pump, refrigerator & determination of efficiencies & COP.
	2nd	Solve simple numerical.
	3rd	Laws of perfect gas, Boyle's law, Charle's law, Avogadro's law.
	4th	Dalton's law of partial pressure, Guy-Lussac's Law.
5th	1st	General gas equation, characteristic gasconstant, Universal gas constant.
	2nd	Explain specific heat of gas (C_p and C_v) Relation between C_p & C_v.
	3rd	Enthalpy of a gas, Work done during a non- flow process.
	4th	Application of first law of thermodynamics to various non flow process (Isothermal, Isobaric, Isentropic and polytrophic process).

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6th	1st	Solve simple problems on above.
	2nd	Free expansion & throttling process.
	3rd	Explain & classify I.C engine.
	4th	Terminology of I.C Engine such as bore, dead centers, stroke volume, piston speed &RPM.
7th	1st	Explain the working principle of 2-stroke engines.
	2nd	Explain the working principle of 4- stroke engine S.I engine.
	3rd	Explain the working principle of 2-stroke & 4- stroke engine C.I engine.
	4th	Differentiate between 2-stroke & 4-stroke engine C.I engine.
8th	1st	Differentiate between 2-stroke & 4-stroke engine S.I engine.
	2nd	Study of valve timing diagram.
	3rd	What is thermodynamic cycle.
	4th	Carnot cycle.
9th	1st	P-V diagram with process.
	2nd	Solve simple numerical.
	3rd	Otto cycle.
	4th	p-v diagram with process.
10th	1st	Solve simple numerical.
	2nd	Diesel cycle.
	3rd	P-V diagram with process.
	4th	Solve simple numerical.
11th	1st	Dual cycle.
	2nd	P-V diagram with process.
	3rd	Solve simple numerical.
	4th	Efficiency comparisons between all.
12th	1st	Comparisons between all cycles.
	2nd	Define Fuel. Types of fuel.
	3rd	Application of different types of fuel.
	4th	Solve simple numerical.
13th	1st	Solve simple numerical.
	2nd	Heating values of fuel.
	3rd	Quality of I.C engine fuels.

	4th	Octane number, Cetane number.
14th	1st	Revision & solve simple numerical.
	2nd	Revision & solve simple numerical.
	3rd	Previous years question paper discussion.
	4th	Previous years question paper discussion.

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LESSON PLAN: EM WINTER SEMESTER 2022

Discipline: **Mechanical Engineering**	Semester: 3 rd Winter 2022	Name of the teaching faculty: **Aurobinda Biswas**	
Subject: **Engineering Materials**	No of days/per week class allotted: **04**	Semester From Date: **15/09/2022** To Date: **22/12/2022** No of weeks:**14**	
Week:	Class day:	Theory/practical topics:	
1st	1st	Material classification into ferrous and nonferrous category.	
	2nd	Alloys and Types of alloys.	
	3rd	Properties of materials: Physical, Chemical and Mechanical.	
	4th	Performance requirements.	
2nd	1st	Material reliability and safety.	
	2nd	Characteristics of ferrous materials.	
	3rd	Application of ferrous materials.	
	4th	Classification of low carbon steel.	
3rd	1st	Composition of low carbon steel.	
	2nd	Application of low carbon steel.	
	3rd	Classification of Medium carbon steel.	
	4th	Composition of Medium carbon steel.	
4th	1st	Application of Medium carbon steel.	
	2nd	Classification of High carbon.	
	3rd	Composition of High carbon steel.	
	4th	Application of High carbon steel.	
5th	1st	Alloy steel.	
	2nd	Low alloy steel.	
	3rd	High alloy steel.	
	4th	Tool steel.	
6th	1st	Stainless steel.	
	2nd	Effect of various alloying elements such as Cr, Mn, Ni, V, Mo.	
	3rd	Cooling curves.	
	4th	Concept of phase diagram.	
7th	1st	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel.	

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	2nd	Crystal defines, Classification of crystals, ideal crystal and crystal Imperfections.
	3rd	Classification of imperfection: Point defects, line defects, surface defects and volume defects.
	4th	Types and causes of point defects: Vacancies, Interstitials and impurities.
8th	1st	Types and causes of line defects: Edge dislocation and screw dislocation.
	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.
	2nd	Usage of Duralmin, y- alloy.
	3rd	Copper alloys: Composition, Property.
	4th	Usage of Copper- Aluminum, Copper-Tin, Babbit , Phosperous bronze, brass, Copper- Nickel.
11th	1st	Predominating elements of lead alloys, Zinc alloys and Nickel alloys.
	2nd	Low alloy materials like P-91, P-22 for power plants and other high temperature services.
	3rd	High alloy materials like stainless steel grades of duplex, super duplex materials etc.
	4th	Bearing Material: Classification, composition.
12th	1st	Properties of Bearing materials.
	2nd	Uses of Copper base, Tin Base, Lead base, Cadmium base bearing materials.
	3rd	Spring Materials: Classification, composition
	4th	Properties of Spring materials.
13th	1st	Uses of Iron-base and Copper base spring material.
	2nd	Properties of Polymers.
	3rd	Application of thermosetting and thermoplastic polymers.
	4th	Properties of elastomers.
14th	1st	Composites and Ceramics: Classification, composition.

	2nd	Properties of Composites and Ceramics.
	3rd	Uses of particulate based and fiber reinforced composites.
	4th	Classification and uses of Ceramics.

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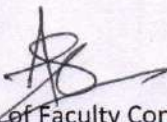Principal
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LESSON PLAN: ME-1 WINTER SEMESTER 2022

Discipline: **Mechanical Engineering**	Semester: 3ᵈ Winter 2022	Name of the teaching faculty: **Aurobinda Biswas**
Subject: **Mechanical Engineering Lab- 1**	No of days/per week class allotted: **04**	Semester From Date: **15/09/2022** To Date: **22/12/2022** No of weeks:**14**
Week:	**Class day:**	**Theory/practical topics:**
1ST	1ST	Determine end reactions in a simply supported beam using parallel force apparatus.
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class.
	4TH	Viva voce test-1 (experiment-1).
2ND	1ST	Determination of Young's modulus using Searle's apparatus.
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class.
	4TH	Viva voce test-2 (experiment-2).
3RD	1ST	Determination of torsional rigidity of the shaft using torsion testing machine.
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class.
	4TH	Viva voce test-3 (experiment-3).
4TH	1ST	Determination of salient points (Young's modulus, yield point, fracture point) from stress- strain curve using Universal Testing Machine.
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class.
	4TH	Viva voce test-4 (experiment-4).
5TH	1ST	Determination of hardness number by Rockwell/Vickers hardness testing machine.
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class.
	4TH	Viva voce test-5 (experiment-5).
6TH	1ST	Determination of toughness using Impact testing machine (Charpy/Izod).
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class.
	4TH	Viva voce test-6 (experiment-6).

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7TH	1ST	Determination of Flash point and fire point.
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class
	4TH	Viva voce test-7 (experiment-7).
8TH	1ST	Joule's experiment.
	2ND	Doubt clear lab class.
	3RD	Doubt clear lab class.
	4TH	Viva voce test-8 (experiment-8).
9TH	1ST	Revision 1
	2ND	Revision 2
	3RD	Revision 3
	4TH	Revision 4
10TH	1ST	Revision 5
	2ND	Revision 6
	3RD	Revision 7
	4TH	Revision 8
11TH	1ST	Revision 9
	2ND	Revision 10
	3RD	Study of simply supported beam using parallel force apparatus by using smart class room.
	4TH	Study of Young's modulus using Searle's apparatus by using smart class room.
12TH	1ST	Study of torsional rigidity of the shaft using torsion testing machine by using smart class room.
	2ND	Study of salient points of Young's modulus, yield point, fracture point from stress- strain curve by using smart class room.
	3RD	Study of hardness number by Rockwell/Vickers hardness testing machine by using smart class room.
	4TH	Study of toughness using Impact testing machine (Charpy/Izod) by using smart class room.
13TH	1ST	Study of Flash point and fire point by using smart class room.
	2ND	Study of Joule's experiment by using smart class room.
	3RD	Record checking of the students 1
	4TH	Record checking of the students 2
14TH	1ST	Grand viva voce test- 1

	2ND	Grand viva voce test- 2
	3RD	Record submission by student.
	4TH	Record checking and final Marking.

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LESSON PLAN: WINTER 2022

Discipline: Mechanical	Semester: **WINTER 2022**	Name of the teaching faculty: **Dambarudhar Patel**
Subject: **Strength of Materials**	No of days/per week class allotted: **04**	Semester From Date: 15/09/2022 To Date: 22/12/2022 No of weeks:14

Week:	Class day:	Theory/practical topics:
1st:	1ST	Types of load, stresses & strains,(Axial and tangential) Hooke's law, Young's modulus, bulk modulus, modulus of rigidity, Poisson's ratio, derive the relation between three elastic constants,
	2ND	Do
	3RD	Do
	4TH	Principle of super position, stresses in composite section
2ND	1ST	Temperature stress, determine the temperature stress in composite bar (single core)
	2ND	Strain energy and resilience, Stress due to gradually applied, suddenly applied and impact load
	3RD	Do
	4TH	Simple problems on above.
3RD	1ST	Do
	2ND	Do
	3RD	Definition of hoop and longitudinal stress, strain
	4TH	Do
4TH	1ST	Derivation of hoop stress, longitudinal stress, hoop strain, longitudinal strain and volumetric strain
	2ND	Do
	3RD	Computation of the change in length, diameter and volume
	4TH	Simple problems on above
5th	1ST	Do
	2ND	Do
	3RD	Determination of normal stress, shear stress and resultant stress on oblique plane
	4TH	Do
6th	1ST	Do
	2ND	Location of principal plane and computation of principal stress
	3RD	Do
	4TH	Do
7th	1ST	Location of principal plane and computation of principal stress and Maximum shear stress using Mohr's circle
	2ND	Do

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	3RD	Do
	4TH	Do
8th	1ST	Types of beam and load
	2ND	Do
	3RD	Concepts of Shear force and bending moment
	4TH	Do
9th	1ST	Shear Force and Bending moment diagram and its salient features illustration in cantilever beam, simply supported beam and over hanging beam under point load and uniformly distributed load
	2ND	Do
	3RD	Do
	4TH	Do
10th	1ST	Do
	2ND	Do
	3RD	Assumptions in the theory of bending,
	4TH	Do
11th	1ST	Bending equation, Moment of resistance, Section modulus& neutral axis.
	2ND	Do
	3RD	Do
	4TH	Solve simple problems.
12th	1ST	Define column, Axial load, Eccentric load on column,
	2ND	Do
	3RD	Direct stresses, Bending stresses, Maximum& Minimum stresses. Numerical problems on above.
	4TH	Do
13th	1ST	Buckling load computation using Euler's formula (no derivation) in Columns with various end conditions
	2ND	Do
	3RD	Assumption of pure torsion
	4TH	The torsion equation for solid and hollow circular shaft
14th	1ST	Do
	2ND	Do
	3RD	Comparison between solid and hollow shaft subjected to pure torsion
	4TH	Do

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LESSON PLAN: WINTER 2022

Discipline: Mechanical	Semester: 3ᵈ WINTER 2022	Name of the teaching faculty: Dambarudhar Patel
Subject: Mechanical Engineering Drawing	No of days/per week class allotted: 06	Semester From Date: 15/09/2022 To Date: 22/12/2022 No of weeks:14

Week	Period	Topic to be covered
1st	1st	Revision of Engineering Drawing of 1st Year
	2nd	Do
	3rd	Do
	4th	Do
	5th	Do
	6th	Do
2nd	1st	Draw plan, elevation and side view of different machine elements from their isometric view using AutoCAD & mini drafter (Minimum 5 Drawings).
	2nd	Do
	3rd	Do
	4th	Do
	5th	Do
	6th	Do
3rd	1st	Bolt, nut ánd threads
	2nd	Do
	3rd	Do
	4th	Do
	5th	Do
	6th	Do
4th	1st	Cotter joint
	2nd	Do
	3rd	Do
	4th	Do
	5th	Do
	6th	Do
5th	1st	Knuckle joint
	2nd	Do
	3rd	Do
	4th	Do
	5th	Do
	6th	Do
6th	1st	Rigid pedestal bearing
	2nd	Do
	3rd	Do
	4th	Do
	5th	Do
	6th	Do
7th	1st	Foot step bearing
	2nd	Do
	3rd	Do

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	4th		Do
	5th		Do
	6th		Do
			Simple Screw jack
8th	1st		Do
	2nd		Do
	3rd		Do
	4th		Do
	5th		Do
	6th		Do
			Connecting rod of IC Engine
9th	1st		Do
	2nd		Do
	3rd		Do
	4th		Do
	5th		Do
	6th		Do
10th	1st		do
	2nd		Boiler safety valve
	3rd		Do
	4th		Do
	5th		Do
	6th		Do
11th	1st		Do
	2nd		Do
	3rd		Do
	4th		Spring loaded valve
	5th		Do
	6th		Do
12th	1st		Do
	2nd		Do
	3rd		Do
	4th		Do
	5th		Hydraulic non return valve
	6th		Do
13th	1st		Do
	2nd		Do
	3rd		Do
	4th		Do
	5th		Do
	6th		Flat belt pulley
14th	1st		Do
	2nd		Do
	3rd		Do
	4th		Do
	5th		Do
	6th		

LESSON PLAN: PT WINTER SEMESTER 2022

Discipline: Mechanical Engg.	Semester: 3rd	Name of the Teaching Faculty: Anirudha Tarai		
Subject: Production Technology	No. of days/Week class allotted: 4	Semester From date:15-09-2022 To Date: 22-12-2022 No. of Weeks: 15		
Week	Class Day	Theory Topics		
1st	1st	Set induction about the subject,objectives,question pattern		
	2nd	Unit-1(Metal Forming Processes): Objectives,Introduction Chalk board summary		
	3rd	MILEY,Extrusion: Definition & Classification Chalk board summary		
	4th	MILEY, Explain direct, indirect and impact extrusion process. Chalk board summary		
2nd	1st	MILEY,Define rolling. Classify it,Chalk board summary		
	2nd	MILEY,Differentiate between cold rolling and hot rolling process. Chalk board summary		
	3rd	MILEY,List the different types of rolling mills used in Rolling process,Chalk board summary		
	4th	MILEY,Video presentation,Assignments,Questions and Answers session		
3rd	1st	Unit-2(Welding): Set Induction,Objectives,Introduction,Define welding and classify various welding processes.,Chalk board summary		
	2nd	MILEY,Explain fluxes used in welding,Chalk board summary		
	3rd	MILEY,Explain Oxy-acetylene welding process,Chalk board summary		
	4th	MILEY,Explain various types of flames used in Oxy-acetylene welding process,Chalk board summary		
4th	1st	MILEY,Explain Arc welding process. Chalk board summary		
	2nd	MILEY,Specify arc welding electrodes,Chalk board summary		
	3rd	MILEY,Define resistance welding and classify it,Chalk board summary		
	4th	MILEY,Describe various resistance welding processes such as butt welding, spot welding, flash welding, projection welding and seam		
5th	1st			
	2nd			
	3rd	MILEY,Explain TIG and MIG welding process,Chalk board summary		
	4th	MILEY,State different welding defects with causes and remedies,Chalk board summary		
6th	1st			
	2nd	MILEY,Video presentation,Assignments,Questions and Answers		
	3rd	Unit-3(Casting): Set Induction,Objectives,Introduction of Casting,Chalk board summary		
	4th	MILEY,Define Casting and Classify the various Casting processes,Chalk board summary		
7th	1st			
	2nd	MILEY,Explain the procedure of Sand mould casting,Chalk board summary		
	3rd	MILEY,Explain different types of molding sands with their composition and properties,Chalk board summary		
	4th			

8th	1st	MILEY,Classify different pattern and state various pattern allowances,Chalk board summary
	2nd	
	3rd	MILEY,Classify core,Chalk board summary
	4th	MILEY,Describe construction and working of cupola and crucible furnace,Chalk board summary
9th	1st	
	2nd	MILEY,Explain die casting method,Chalk board summary
	3rd	MILEY,Explain centrifugal casting such as true centrifugal casting, centrifuging with advantages, limitation and area of application,Chalk board summary
	4th	
10th	1st	
	2nd	MILEY,Explain various casting defects with their causes and remedies,Chalk board summary
	3rd	MILEY,Video presentation,Assignments,Questions and Answers
	4th	Unit-4(Powder Metallurgy): Set Induction,Objectives,Introduction of Powder Metallurgy,Chalk board summary
11th	1st	MILEY,Define powder metallurgy process,Chalk board summary
	2nd	MILEY,State advantages of powder metallurgy technology technique,Chalk board summary
	3rd	MILEY,Describe the methods of producing components by powder metallurgy technique,Chalk board summary
	4th	
12th	1st	MILEY,Explain sintering,Chalk board summary
	2nd	MILEY,Economics of powder metallurgy,Chalk board summary
	3rd	MILEY,Video presentation,Questions and Answers session
	4th	Unit-5(Press Work): Set induction,Objectives,introduction to Press Work,Chalk board summary
13th	1st	MILEY,Describe Press Works: blanking, piercing and trimming,Chalk board summary
	2nd	MILEY,List various types of die and punch,Chalk board summary
	3rd	MILEY,Explain simple, Compound & Progressive dies,Chalk board summary
	4th	MILEY,Describe the various advantages & disadvantages of above dies,Chalk board summary
14th	1st	MILEY,Video presentation,Assignments,Questions and Answers session
	2nd	Unit-6(Jigs and fixtures): Set induction,Objectives,introduction to Jigs and fixtures,Define jigs and fixtures,chalk board summary
	3rd	MILEY,State advantages of using jigs and fixtures,State the principle of locations,Chalk board summary
	4th	MILEY,Describe the methods of location with respect to 3-2-1 point location of rectangular jig,Chalk board summary
15th	1st	MILEY,List various types of jig and fixtures,Chalk board summary
	2nd	MILEY,Video presentation,Assignments,Questions and Answers session
	3rd	Revision,Objective Test,Classroom Presentation by students
	4th	

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