

LESSON PLAN FOR ENTREPRENEURSHIP and MANAGEMENT & SMART TECHNOLOGY.

Mechanical Engineering	5 th semester	Er. HADU BANDHU DAKUA
ENTREPRENEURSHIP and MANAGEMENT & SMART TECHNOLOGY	04/week	Semester
		No. of weeks :15
Week	Class day	Theory topics
1	1st	Introduction, Course outcomes, Reference books for subject.
	2nd	Concept/Meaning of Entrepreneurship
	3rd	Need of Entrepreneurship
	4th	Characteristics , Qualities and Types of entrepreneur, Functions
2	1st	Barriers in entrepreneurship
	2nd	Entrepreneurs Vrs Manger
	3rd	Forms of Business Ownership: Solo proprietorship, partnership forms and others
	4th	Types of Industries, concept of Start-ups
3	1st	Entrepreunial support agencies at National, Staste, District Level(Sources): DIC, NSIC, OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc.
	2nd	Technology Business Incubators(TBI) and Science and Technology Entrepreneur Parks.
	3rd	Business Planning
	4th	SSI, Ancillary Units
4	1st	Tiny Units, Servivr sector Units
	2nd	Time schedule plan, Agencies to be contacted for project implementation
	3rd	Assessment of Demand and Supply
	4th	Pontential areas of Growth
5	1st	Identifying Business Opportunity
	2nd	Final Product Selection.
	3rd	Preliminary project report
	4th	Detailed project report
6	1st	Techno economic Feasibility
	2nd	Project Viability
	3rd	Definitions of management
	4th	Principles of management

7	1st	Functions of management (planning, organising, staffing)
	2nd	Functions of management(directing and controlling etc.)
	3rd	Level of Management in an Organisation
	4th	Production management <ul style="list-style-type: none"> • Functions • Activities •
8	1st	Production management <ul style="list-style-type: none"> • Quality control • Production Planning and control
	2nd	Inventory Management <ul style="list-style-type: none"> • Need for Inventory management
	3rd	Inventory Management <ul style="list-style-type: none"> • Models/Techniques of Inventory management
	4th	Comparision of Nuclear and Thermal power plant.
9	1st	Financial Management <ul style="list-style-type: none"> • Functions of Financial management • Management of Working capital • Costing (only concept)
	2nd	<ul style="list-style-type: none"> • Break even Analysis • Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash book, P&L Accounts, Balance Sheets(only Concepts)
	3rd	Marketing Management <ul style="list-style-type: none"> • Concept of Marketing and Marketing Management • Marketing Techniques (only concepts)
	4th	Concept of 4P s (Price, Place, Product, Promotion)
10	1st	Human Resource Management <ul style="list-style-type: none"> • Functions of Personnel Management
	2nd	<ul style="list-style-type: none"> • Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training & Development, Payment of Wages
	3rd	Leadership <ul style="list-style-type: none"> • Definition and Need/Importance
	4th	<ul style="list-style-type: none"> • Qualities and functions of a leader Manager Vs Leader

11	1st	Style of Leadership (Autocratic Democratic, Participative)
	2nd	Motivation <ul style="list-style-type: none"> • Definition and characteristics • Importance of motivation • Factors affecting motivation • Theories of motivation (Maslow)
	3rd	Motivation <ul style="list-style-type: none"> • Methods of Improving Motivation • Importance of Communication in Business • Types and Barriers of Communicatio
	4th	Work Culture, TQM & Safety <ul style="list-style-type: none"> • Human relationship and Performance in Organization
12	1st	Relations with Peers, Superiors and Subordinates
	2nd	TQM concepts: Quality Policy, Quality Management, Quality system
	3rd	Accidents and Safety, Cause, preventive measures,
	4th	General Safety Rules , Personal Protection Equipment(PPE)
13	1st	Legislation a) Intellectual Property Rights(IPR),
	2nd	b) Features of Factories Act 1948 with Amendment (only salient points)
	3rd	b) Features of Factories Act 1948 with Amendment (only salient points)
	4th	c) Features of Payment of Wages Act 1936 (only salient points)
14	1st	c) Features of Payment of Wages Act 1936 (only salient points)
	2nd	c) Features of Payment of Wages Act 1936 (only salient points)
	3rd	Smart Technology
	4th	<ul style="list-style-type: none"> • Concept of IOT, How IOT works
15	1st	<ul style="list-style-type: none"> • Components of IOT, Characteristics of IOT
	2nd	Categories of IOT
	3rd	<ul style="list-style-type: none"> • Applications of IOT- Smart Cities, Smart Transportation, Smart Home
	4th	Smart Healthcare, Smart Industry, Smart Agriculture, Smart Energy Management etc.

TOTAL PERIODS: 60
NO. OF WEEKS : 15

UCPES, BERHAMPUR

LESSON PLAN, SESSON-2024-2025

DEPARTMENT :- ELECTRICAL ENGINEERING

SEMESTER:-3rd

NAME OF THE TEACHING STAFF/FACULTY:- HADU BANDHU DAKUA

SUBJECT: ELEMENT OF MECHANICAL ENGINEERING

NO OF PAYS/WEEK CLASS ALLOTTED=04

WEEK	CLASS DAY	MODULE	TOPIC	DATE
1 ST	1 ST	1.1	Introduction of thermodynamic.	
	2 nd	1.1	Unit of heat and work and pdv work.	
	3 rd	1.1	1 st law of thermodynamics.	
	4 th	1.2	State law of perfect gas.	
2 nd	1st	1.3	Determine relationship Cp and Cv.	
	2 nd	1.3	Derivation on Cp- Cv = R.	
	3rd	2.1	Use of steam table for solution of simple problem.	
	4th	2.2	Formation of steam at a constant pressure from water.	
3rd	1st	2.2	Important term for steam (wet,dry,super heated steam).	
	2nd	2.2	Phase change phenomenon of a pure substance.	
	3rd	2.2	Total heat graph during steam formation.	
	4th	3.1	State types of boiler.	
4th	1 ST	3.1	Important terms if boiler.	
	2 nd	3.1	Classification of steam boiler.	
	3 rd	3.2	Describe Cochran boiler.	
	4 th	3.2	Babcock Wilcox boiler.	
5th	1 ST	3.2	Comparison between water tube boiler and firetube boiler.	
	2 nd	3.3	Describe the mountings.	
	3 rd	3.3	Describe the accessories (a)super heater.	
	4 th	3.3	Describe the accessories (b)economizer.	
6th	1 ST	3.3	Describe the accessories (c)air pre heater.	
	2 nd	4.1	Explain the principle of simple steam turbine.	
	3 rd	4.1	Classification of steam engine.	
	4 th	4.1	Important parts of steam engine.	
	1 ST	4.1	Working of single cylinder double acting horizontal steam engine.	
7th	2 nd	4.2	Draw indicator diagram of a simple steam engine.	
	3 rd	4.2	Theoretical or hypothetical indicator diagram.	
	4 th	4.2	Theoretical or hypothetical mean effective pressure.	
	1 ST	4.2	Actual indicator diagram.	
8th	2 nd	4.3	Calculate mean effective pressure IHP and BHP.	
	3 rd	4.4	Solve simple problem.	
	4 th	5.1	State type of turbine.	

9th	1 ST	5.2	Describe impulse turbine.	
	2 nd	5.2	Pressure and velocity of steam in an impulse turbine	
	3 rd	5.2	Describe reaction turbine.	
	4 th	5.2	Advantage and disadvantage of steam turbine.	
10th	1 ST	5.2	Difference between impulse and reaction turbine.	
	2 nd	6.1	Explain the function of condenser.	
	3 rd	6.2	State type of condenser.	
	4 th	6.2	Jet condenser.	
11th	1 ST	6.2	Surface condenser.	
	2 nd	7.1	Explain the working of two stroke petrol and diesel engine.	
	3 rd	7.1	Explain the working of four stroke petrol and diesel engine.	
	4 th	7.2	Difference between two stroke and four stroke engine.	
12th	1 ST	7.2	Difference between petrol and diesel engine.	
	2 nd	8.1	Describe the property of fluid.	
	3 rd	8.1	Newtons law of fluid.	
	4 th	8.2	Determine pressure at a point pressure measuring instrument.	
13th	1 ST	8.2	U-tube manometer.	
	2 nd	8.2	Numerical on U-tube manometer.	
	3 rd	9.1	Type of fluid flow.	
	4 th	9.1	Deduce equation of continuity of flow.	
14th	1 ST	9.2	Explain energy of flowing liquid.	
	2 nd	9.3	State and explain Bernoulli's	
	3 rd	9.3	Numerical on Bernoulli's theorem and continuity flow.	
	4 th	10.1	Intensifier.	
15th	1 ST	10.2	Direct acting hydraulic lift.	
	2 nd	10.2	Suspended hydraulic lift.	
	3 rd	10.3	Accumulator.	
	4 th	10.4	Hydraulic ram.	

3rd SEMESTER MECHANICAL

SUBJECT- ENGINEERING MATERIALS

TOTAL PERIODS-60
THEORY-4P/WEEK

NAME OF FACULTY :HADU BANDHU DAKUA

Sl No.	week	Day	Topics to be covered
1	1 st	1 st day	Material classification into ferrous and non ferrous category and alloys
		2 nd day	Properties of Materials: Physical and Chemical Mechanical
		3 rd day	Properties of Materials: Mechanical and Thermal properties
		4 th day	Material reliability and safety
2	2 nd	1 st day	Characteristics and application of ferrous materials
		2 nd day	Classification, composition and application of low carbon steel,
		3 rd day	Classification, composition and application of medium carbon steel and High carbon steel
		4 th day	Alloy steel: Low alloy steel and high alloy steel
3	3 rd	1 st day	Types of tool steel and stainless steel:Classification,Properties and uses
		2 nd day	Tool steel: Effect of various alloying elements such as Cr, Mn, Ni, V, Mo,
		3 rd day	Introduction to Iron – Carbon system
		4 th day	Concept of phase diagram
4	4 th	1 st day	Concept of Cooling curves
		2 nd day	Features of Iron-Carbon diagram with salient micro-constituents of Iron and Steel
		3 rd day	Iron-Carbon diagram
		4 th day	Crystal defines and classification of crystals
5	5 th	1 st day	Ideal crystal definition
		2 nd day	Classification of imperfection: Point defects and Line defects
		3 rd day	Types of surface defects and volume defects
		4 th day	Types and causes of point defects: Vacancies, Interstitials and impurities
6	6 th	1 st day	Types and causes of line defects: Edge dislocation and screw dislocation
		2 nd day	Effect of imperfection on material properties

		3 rd day	Deformation by slip and twinning
		4 th day	Effect of deformation on material properties
Sl No.	week	Day	Topics to be covered
7	7 th	1 st day	Introduction to Heat Treatment
		2 nd day	Purpose of Heat treatment
		3 rd day	Process of heat treatment: Annealing, Normalizing and Hardening
		4 th day	Tempering and stress relieving measures
Sl No.	week	Day	Topics to be covered
8	8 th	1 st day	Surface hardening: Carburizing and Nitriding process
		2 nd day	Effect of heat treatment on properties of steel
		3 rd day	Hardenability of steel
		4 th day	Revision and Discussions with doubt clearance
Sl No.	week	Day	Topics to be covered
9	9 th	1 st day	Introduction to Non-ferrous alloys
		2 nd day	Aluminum alloys: Composition, property and usage of Duralmin, γ -alloy
		3 rd day	Copper alloys: Composition, property and usage of CopperAluminum, Copper-Tin, Babbit alloys
		4 th day	Copper alloys: Composition, property and usage of Phosperous bronze, brass, Copper- Nickel alloys
Sl No.	week	Day	Topics to be covered
10	10 th	1 st day	Predominating elements of lead alloys, Zinc alloys and Nickel alloys
		2 nd day	Low alloy materials like P-91, P-22 for power plants
		3 rd day	High alloy materials like stainless steel grades of duplex, super duplex materials
		4 th day	Introduction to Bearing Material
Sl No.	week	Day	Topics to be covered
11	11 th	1 st day	Classification, composition, properties and uses of Copper base bearing materials
		2 nd day	Classification, composition, properties and uses of Tin Base and Lead base, bearing materials

		3 rd day	Classification, composition, properties and uses of Cadmium base bearing materials
		4 th day	Doubt clearance
Sl No.	week	Day	Topics to be covered
12	12 th	1 st day	Introduction to Spring materials
		2 nd day	Classification, composition, properties and uses of Ironbase Spring materials
		3 rd day	Classification, composition, properties and uses of copperbase Spring materials
		4 th day	Doubt clearance
Sl No.	week	Day	Topics to be covered
13	13 th	1 st day	Introduction to Polymers
		2 nd day	Classification of Polymers and types
		3 rd day	Polymer reaction
		4 th day	Properties and uses of Plastics
Sl No.	week	Day	Topics to be covered
14	14 th	1 st day	Properties and application of Thermosetting and Thermoplastic polymers
		2 nd day	Properties of Elastomers and types
		3 rd day	Uses of Elastomers
		4 th day	Introduction to composites and Ceramics
Sl No.	week	Day	Topics to be covered
15	15 th	1 st day	Classification, composition and properties of Composites
		2 nd day	Uses of particulate based and fibre reinforced composites
		3 rd day	Classification and uses of ceramics
		4 th day	Classification and uses of ceramics

LESSON PLAN-5TH SEMESTER

Subject- [TH.5] REFRIGERATION AND AIR CONDITIONING

Name of the Faculty- HADU BANDHU DAKUA

MONTH	CHAPTER /UNIT	COURSE TO BE COVERED	CLASSES REQUIRED	REMARKS (IF ANY)
	Chapter-1	AIR REFRIGERATION CYCLE.	05	
	1.1	Definition of refrigeration and unit of refrigeration.	2	
	1.2	Definition of COP, Refrigerating effect (R.E)	1	
	1.3	Principle of working of open and closed air system of refrigeration.	1	
	1.3.1	Calculation of COP of Bell-Coleman cycle and numerical on it.	1	
	Chapter -2	SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM	10	
	2.1	Layout of steam power stations	1	
	2.2	Types	2	
	2.2.1	Cycle with dry saturated vapors after compression.		
	2.2.2	Cycle with wet vapors after compression		
	2.2.3	Cycle with superheated vapors after compression.	2	
	2.2.4	Cycle with superheated vapors before compression		
	2.2.5	Cycle with sub cooling of refrigerant	3	
	2.2.6	Representation of above cycle on temperature entropy and pressure enthalpy diagram		
	2.2.7	Numerical on above (determination of COP, mass flow)	2	
	Chapter-3	VAPOUR ABSORPTION REFRIGERATION SYSTEM	07	
	3.1	Simple vapor absorption refrigeration system	1	
	3.2	Practical vapor absorption refrigeration system	2	
	3.3	COP of an ideal vapor absorption refrigeration system	2	
	3.4	Numerical on COP.	2	
	Chapter-4	REFRIGERATION EQUIPMENTS	08	
	4.1	REFRIGERANT COMPRESSORS		
	4.1.1	Principle of working and constructional details of reciprocating and rotary compressors.	1	

	4.1.2 4.1.3	Centrifugal compressor only theory Important terms	1	
	4.1.4	Hermetically and semi hermetically sealed compressor	1	
	4.2 4.2.1	CONDENSERS Principle of working and constructional details of air cooled and water cooled condenser	1	
	4.2.2 4.2.3	Heat rejection ratio. Cooling tower and spray pond.	1	
	4.3 4.3.1	EVAPORATORS Principle of working and constructional details of an evaporator.	1	
	4.3.2 4.3.3	Types of evaporator. Bare tube coil evaporator, finned evaporator, shell and tube evaporator.	2	
	Chapter-5	REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS	10	
	5.1 5.1.1 5.1.2	EXPANSION VALVES Capillary tube Automatic expansion valve	2	
	5.1.3	Thermostatic expansion valve	1	
	5.2	REFRIGERANTS Classification of refrigerants Desirable properties of an ideal refrigerant.	1	
	5.2.3	Designation of refrigerant.	1	
	5.2.4 5.2.5	Thermodynamic Properties of Refrigerants. Chemical properties of refrigerants.	1	
	5.6	commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717 Substitute for CFC	1	
	5.3 5.3.1 5.3.2	Applications of refrigeration Cold storage Dairy refrigeration	1	
	5.3.3 5.3.4	Ice plant water cooler	1	
	5.3.5	Frost free refrigerator	1	
	Chapter-6	PSYCHOMETRICS & COMFORT AIR	10	

	6.1	CONDITIONING SYSTEMS Psychometric terms	1	
	6.2	Adiabatic saturation of air by evaporation of water	1	
	6.3	Psychometric chart and uses.	1	
	6.4 6.4.1 6.4.2	Psychometric processes Sensible heating and Cooling Cooling and Dehumidification	2	
	6.4.3	Heating and Humidification	1	
	6.4.4 6.4.5 6.4.6	Adiabatic cooling with humidification Total heating of a cooling process SHF, BPF	1	
	6.4.7 6.4.8	Adiabatic mixing Problems on above.	2	
	6.5	Effective temperature and Comfort chart	1	
	7.0	AIR CONDITIONING SYSTEMS	10	
	7.1 7.2	Factors affecting comfort air conditioning. . Equipment used in an air-conditioning.	3	
	7.3	Classification of air-conditioning system	1	
	7.4 7.5	Winter Air Conditioning System Summer air-conditioning system	2	
	7.6	Numerical on above	4	