Vedang Institute of Technology Lesson Plan		
Discipline: Mechanical Engineering	Semester: 5th	Name of the Teaching Faculty: Samaresh Pratap Mohanty
Subject : Design of Machine Elements	No. of day days/Per weeks Class Allotted Weeks :4	Semester from date : 01/08/2023 To Date: 30/11/2023 No. of Weeks :15
Weeks	Class day	Theory
1ST	1st	Introduction to Machine Design and Classify it.
	2nd	Different mechanical engineering materials used in design with their uses and their mechanical and physical properties.
	3rd	Different mechanical engineering materials used in design with their uses and their mechanical and physical properties
	4th	Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I
2ND	1st	Define working stress, yield stress, ultimate stress & factor of safety and stress –strain curve for M.S & C.I
	2nd	Modes of Failure (By elastic deflection, general yielding & fracture)
	3rd	Modes of Failure (By elastic deflection, general yielding & fracture
	4th	State the factors governing the design of machine elements
3RD	1st	State the factors governing the design of machine elements
	2nd	Describe design procedure.
	3rd	Describe design procedure.
	4th	REVISION
4TH	1st	Joints and their classification.
	2nd	State types of welded joints.
	3rd	State advantages of welded joints over other joints.
	4th	Design of welded joints for eccentric loads
5TH	1st	State types of riveted joints and types of rivets.
	2nd	Describe failure of riveted joints
	3rd	Determine strength & efficiency of riveted joints
	4th	Design riveted joints for pressure vessel.
6TH	1st	Solve numerical on Welded Joint and Riveted Joints.
	2nd	Solve numerical on Welded Joint and Riveted Joints.
	3rd	Solve numerical on Welded Joint and Riveted Joints.
	4th	REVISION
7TH	1st	Design of shafts and Keys
	2nd	State function of shafts
	3rd	State materials for shafts.
	4th	Design solid & hollow shafts to transmit a given power at given rpm based on (a) Strength: (i) Shear stress, (ii)

		Combined bending & tension
8TH	1st	Design solid & hollow shafts to transmit a given powerat given rpm based on Rigidity: (i) Angle of twist, (ii) Deflection, (iii) Modulus of rigidity
	2nd	State standard size of shaft as per I.S.
	3rd	State function of keys, types of keys & material of keys
	4th	Describe failure of key, effect of key way
9TH	1st	Design rectangular sunk key considering its failure againstshear & crushing
	2nd	Design rectangular sunk key by using empirical relation for given diameter of shaft
	3rd	State specification of parallel key, gib-head key, taper keyas per I.S.
	4th	Solve numerical on Design of Shaft and keys
10TH	1st	Design of belt drivers and pulleys
	2nd	State types of belt drives & pulleys
	3rd	State formula for length of open belt
	4th	State formula for length of crossed belt,
11TH	1st	Ratio of driving and driven side tension
	2nd	Centrifugal tension
	3rd	Relation between centrifugal tension and tension on tightside for maximum power transmission
	4th	Determine belt thickness and width for given permissible Stress for open belt considering centrifugal tension.
12TH	1st	Determine belt thickness and width for given permissibleStress for crossed belt considering centrifugal tension.
	2nd	Design a cast iron (C.I) pulley using empirical formula only
	3rd	Solve numerical on design of belt and design of C.I pulley
	4th	Solve numerical on design of belt and design of C.I pulley
13TH	1st	Design a closed coil helical spring
	2nd	Materials used for helical spring
	3rd	Standard size spring wire. (SWG)
	4th	Terms used in compression spring
14TH	1st	Stress in helical spring of a circular wire
	2nd	End connection for helical tension spring
	3rd	Deflection of helical spring of circular wire
	4th	Eccentric loading of spring
15TH	1st	Surge in spring
	2nd	Solve numerical on design of spring
	3rd	Solve numerical on design of spring
	4th	Solve numerical on design of spring

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Lesson Plan

Discipline Mechanical Engineering	**Semester – 5th**	**Name of Teaching Staff: Priyanka Barik**
Subject Entrepreneurship and Management & Smart Technology	**No. of days/Per weeks Class Allotted Weeks: 4**	**Semester from date : 01/08/2023 To Date: 30/11/2023 No. of Weeks : 15**
Weeks	**Class day**	**Theory**
1ST	1st	Entrepreneurship ,Concept /Meaning of Entrepreneurship Need of Entrepreneurship,Characteristics, Qualities and Types of entrepreneur, Functions
	2nd	Barriers in entrepreneurship, Entrepreneurs vrs. Manager
	3rd	Forms of Business Ownership: Sole proprietorship, partnership forms and others
	4th	Types of Industries, Concept of Start-ups
2ND	1st	Entrepreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC, SIDBI, NABARD, Commercial Banks, KVIC etc
	2nd	Entrepreneurial support agencies at National, State, District Level(Sources): DIC, NSIC,OSIC, SIDBI, NABARD,Commercial Banks, KVIC etc
	3rd	Technology Business Incubators (TBI) and Scienceand Technology Entrepreneur Parks
	4th	Technology Business Incubators (TBI) and Scienceand Technology Entrepreneur Parks
3RD	1st	Market Survey and Opportunity Identification (Business Planning)
	2nd	Business Planning
	3rd	SSI, Ancillary Units, Tiny Units, Service sector Units
	4th	Time schedule Plan, Agencies to be contacted for Project Implementation
4TH	1st	Assessment of Demand and supply and Potential areas ofGrowth
	2nd	Identifying Business Opportunity
	3rd	Final Product selection
	4th	Project report Preparation
5TH	1st	Preliminary project report
	2nd	Detailed project report, Techno economic Feasibility
	3rd	Project Viability
	4th	Management Principles

6TH	1st	Definitions of management
	2nd	Principles of management
	3rd	Functions of management (planning, organising, staffing, directing and controlling etc.)
	4th	Level of Management in an Organisation
7TH	1st	Functional Areas of Management
	2nd	a) Production management , Functions, Activities , Productivity
	3rd	• Quality control, Production Planning and control
	4th	b) Inventory Management , Need for Inventory management , Models/Techniques of Inventory management
8TH	1st	c) Financial Management, Functions of Financialmanagement
	2nd	• Management of Working capital ,Costing (only concept)
	3rd	• Break even Analysis , Brief idea about Accounting Terminologies: Book Keeping, Journal entry, Petty Cash book, P&L Accounts, Balance Sheets(only Concepts) d) Marketing Management
	4th	Concept of Marketing and Marketing Management Marketing Techniques (only concepts) Concept of 4P s (Price, Place, Product, Promotion)
9TH	1st	e) Human Resource Management Functions of Personnel Management
	2nd	• Manpower Planning, Recruitment, Sources of manpower, Selection process, Method of Testing, Methods of Training& Development, Payment of Wages
	3rd	Leadership and Motivation a) Leadership , Definition and Need/Importance
	4th	• Qualities and functions of a leader, Manager Vs Leader)
10TH	1st	• Style of Leadership (Autocratic, Democratic, Participative
	2nd	b) Motivation , Definition and characteristics, Importanceof motivation , Factors affecting motivation
	3rd	• Theories of motivation (Maslow) , Methods of Improving Motivation
	4th	• Importance of Communication in Business , Typesand Barriers of Communication
11TH	1st	Work Culture, TQM & Safety , Human relationship and Performance in Organization
	2nd	• Relations with Peers, Superiors and Subordinates
	3rd	• TQM concepts: Quality Policy, Quality Management,Quality system
	4th	• Accidents and Safety, Cause, preventive measures,General Safety Rules , Personal Protection Equipment(PPE)
12TH	1st	•Accidents and Safety, Cause, preventive measures,General Safety Rules , Personal Protection Equipment(PPE)
	2nd	Legislation a) Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights
	3rd	a) Intellectual Property Rights(IPR), Patents, Trademarks, Copyrights
	4th	b) Features of Factories Act 1948 with Amendment (only salient points)
13TH	1st	b) Features of Factories Act 1948 with Amendment (only salient points)

	2nd	c) Features of Payment of Wages Act 1936 (only salient points)
	3rd	c) Features of Payment of Wages Act 1936 (only salient points)
	4th	Smart Technology ,Concept of IOT, How IOT works ,
14TH	1st	• Concept of IOT, How IOT works
	2nd	Components of IOT, Characteristics of IOT, Categories of IOT
	3rd	Components of IOT, Characteristics of IOT, Categories ofIOT
	4th	• Applications of IOT- Smart Cities, Smart Transportation,
15TH	1st	Smart Home., Smart Healthcare,
	2nd	Smart Industry, Smart Agriculture,
	3rd	Smart Energy Management etc
	4th	Revision.

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Vedang Institute of Technology Lesson Plan		
Discipline : Mechanical Engineering	SEMESTER: 5TH	Name of Teaching Staff: Soumyashree Senapati
Subject: Hydraulic Machines & Industrial Fluid Power	No. of days/Per weeks Class Allotted Weeks: 4	Semester from date : 01/08/2023 To Date: 30/11/2023 No. of Weeks : 15
Weeks	Class day	Theory
1ST	1st	**Module-1** Definition of hydraulic turbines
	2nd	Classification of hydraulic turbines
	3rd	Construction of impulse turbine.
	4th	working principle of impulse turbine
2ND	1st	Class test.
	2nd	Velocity diagram of moving blades, work done and derivation of various efficiencies of impulse turbine.
	3rd	Numerical
	4th	Velocity diagram of moving blades, work done and derivation of various efficiencies of Francis turbine.
3RD	1st	Numerical
	2nd	Velocity diagram of moving blades, work done and derivation of various efficiencies of Kaplan turbine
	3rd	Numerical on above
	4th	Distinguish between impulse turbine and reaction turbine.
4TH	1st	Class test
	2nd	**Module-2** **CENTRIFUGAL PUMPS** Construction and working principle of centrifugal pumps
	3rd	Numerical

	4th	Work done and derivation of various efficiencies of centrifugal pumps.
5TH	1st	Numerical on above
	2nd	Class test
	3rd	**Module-3** **RECIPROCATING PUMPS** . Describe construction & working of single acting reciprocating pump.
	4th	Numerical
6TH	1st	Describe construction & working of double acting reciprocating pump.
	2nd	
	3rd	Derive the formula foe power required to drive the pump (Single acting & double acting)
	4th	
7TH	1st	Define slip.
	2nd	State positive & negative slip & establish relation between slip & coefficient of discharge.
	3rd	Solve numerical on above
	4th	Class test
8TH	1st	**Module-4** **PNEUMATIC CONTROL SYSTEM** Elements –filter-regulator-lubrication unit
	2nd	Revision
	3rd	Pressure control valves
	4th	Numerical
9TH	1st	Pressure relief valves
	2nd	Pressure regulation valves Direction control valves 3/2DCV,5/2 DCV,5/3DCV
	3rd	Numerical
	4th	Flow control valves
10TH	1st	Throttle valves

	2nd	Numerical
	3rd	ISO Symbols of pneumatic components Pneumatic circuits
	4th	Numerical
11TH	1st	Direct control of single acting cylinder
	2nd	Numerical
	3rd	Quiz
	4th	Operation of double acting cylinder
12TH	1st	Operation of double acting cylinder with metering in and metering out control
	2nd	Class Test
	3rd	**Module-5** **HYDRAULIC CONTROL SYSTEM** Hydraulic system, its merit and demerits
	4th	Hydraulic accumulators
13TH	1st	Numerical
	2nd	Pressure control valves
	3rd	Pressure relief valves
	4th	Pressure regulation valves
14TH	1st	Direction control valves
	2nd	Numerical
	3rd	3/2DCV,5/2 DCV,5/3DCV
	4th	Numerical
15TH	1st	5.3.2 Flow control valves
	2nd	5.3.3 Throttle valves
	3rd	Revision
	4th	Revision

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Vedang Institute of Technology
Lesson Plan

Discipline: **Mechanical Engineering**	SEMESTER: **5th**	Name of Teaching Staff: **Amruta Panda**
Subject: **Mechatronics**	No. of days/Per weeks Class Allotted Weeks: **04**	Semester starts: **01/08/2023** Semester ends: **30/11/2023** No. of Weeks: **15**
Weeks	**Class day**	**Theory**
1ST	1st	Definition of Mechatronics, Advantages & Disadvantages of Mechatronics
	2nd	Application of Mechatronics
	3rd	Scope of Mechatronics in Industrial Sector
	4th	Components of Mechatronics System
2ND	1st	Importance of Mechatronics in automation
	2nd	Definition of Transducers, Classification of Transducers
	3rd	Electromechanical Transducers
	4th	Transducers Actuation Mechanism
3RD	1st	Displacement & Positions Sensors
	2nd	Displacement & Positions Sensors
	3rd	Velocity, Motion, Force and Pressure Sensors
	4th	Velocity, Motion, Force and Pressure Sensors
4TH	1st	Temperature and Light Sensors
	2nd	Displacement &Positions Sensors.
	3rd	Mechanical Actuators
	4th	Machine, Kinematic Link, Kinematic Pair
5TH	1st	Machine, Kinematic Link, Kinematic Pair
	2nd	Mechanism, Slider Crank Mechanism
	3rd	Gear Drive, Spur Gear, Bevel Gear, Helical Gear, Worm Gear
	4th	Belt & Belt Drive, Bearing
6TH	1st	Electrical Actuator, Switches and Relay
	2nd	Solenoid, D.C. Motors
	3rd	AC.Motors, Steppers Motors
	4th	Specification and control of stepper motors
7TH	1st	Servo Motors DC & AC
	2nd	Introduction to PLC
	3rd	Advantages of PLC
	4th	Selection and uses of PLC

8TH	1st	Selection and uses of PLC
	2nd	Architecture basic internal structures
	3rd	Architecture basic internal structures
	4th	Architecture basic internal structures
	1st	Input/ Output Processing and Programming
	2nd	Input/ Output Processing and Programming
	3rd	Input/ Output Processing and Programming
	4th	Mnemonics
10TH	1st	Mnemonics
	2nd	Master and Jump Controllers
	3rd	Master and Jump Controllers
	4th	Introduction to Numerical Control of Machines and CAD/CAM
11TH	1st	Introduction to Numerical Control of Machines and CAD/CAM
	2nd	NC Machines
	3rd	CNC Machies
	4th	CAD/ CAM
12TH	1st	Software and Hardware for CAD/CAM
	2nd	Functioning of CAD/CAM system
	3rd	Features and characteristic of CAD/CAM system
	4th	Application areas for CAD/CAM
13TH	1st	Elements of CNC machines
	2nd	Introduction to Machine Structure
	3rd	Guideways/Slide ways.
	4th	Introduction and Types of Guideways
14th	1st	Facturs of Design of Guideways
	2nd	Drives, Spindle Drives
	3rd	Feed Drives, Spindle and Spindle Bearings
	4th	Definition, Function and Laws of Robotics
15TH	1st	Robotics Systems
	2nd	Advantages and Disadvantages of Robots
	3rd	Revision and Doubt Clearance
	4th	Revision and Doubt Clearance

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Vedang Institute of Technology
Lesson Plan

Discipline **Mechanical Engineering**	**Semester** **5th**	**Name of the Teaching Faculty** **Soumya Ranjan Nayak**
Subject **Refrigeration & Air Conditioning**	**No. of days/Per weeks Class Allotted Weeks** **4 P/W**	**Semester from date** **01/08/2023 to 30/11/2023** **No. of Weeks -15**
Weeks	**Class Period**	**Theory**
1ST	1st	Air Refrigeration System
	2nd	Definition of refrigeration and unit of refrigeration.
	3rd	Definition of COP, Refrigerating effect (R.E)
	4th	Principle of working of open and closed air system of refrigeration.
2ND	1st	Simple Vapour Refrigeration System
	2nd	schematic diagram of simple vapors compression refrigeration system
	3rd	Types of Refrigeration Cycle
	4th	Cycle with dry saturated vapors after compression.
3RD	1st	Cycle with wet vapors after compression.
	2nd	Cycle with superheated vapors after compression.
	3rd	Cycle with superheated vapors before compression.
	4th	Cycle with sub cooling of refrigerant
4TH	1st	Representation of above cycle on temperature entropy and pressure enthalpy diagram
	2nd	Numerical on above (determination of COP, mass flow)
	3rd	Vapour Absorption Refrigeration System
	4th	Simple vapor absorption refrigeration system
5TH	1st	Practical vapor absorption refrigeration system
	2nd	COP of an ideal vapor absorption refrigeration system.
	3rd	Numerical on COP
	4th	Refrigeration Equipments
6TH	1st	Refrigeration Components
	2nd	Principle of working and constructional details of reciprocating and rotary compressors
	3rd	Centrifugal compressor only theory
	4th	Important terms. Hermetically and semi hermetically sealed compresser.
7TH	1st	Condenser
	2nd	Principle of working and constructional details of air cooled and water cooled condenser
	3rd	Heat rejection ratio
	4th	Cooling tower and spray pond
8TH	1st	Evaporaters
	2nd	Principle of working and constructional details of an evaporator.

	3rd	Types of evaporator, Bare tube coil evaporator, finned evaporator, shell and tube evaporator
	4th	Refrigerant Flow Control
9TH	1st	Expansion Valve, Capillary tube
	2nd	Automatic expansion valve, Thermostatic expansion valve
	3rd	Refrigerant, Classification of refrigerants
	4th	Desirable properties of an ideal refrigerant. , Designation of refrigerant.
10TH	1st	Thermodynamic Properties of Refrigerants, Chemical properties of refrigerants.
	2nd	commonly used refrigerants, R-11, R-12, R-22, R-134a, R- 717 Substitute for CFC
	3rd	Applications of refrigeration
	4th	cold storage, dairy refrigeration
11TH	1st	ice plant, water cooler
	2nd	frost free refrigerator
	3rd	Air Conditioning Systems
	4th	Psychometric terms
12TH	1st	Adiabatic saturation of air by evaporation of water
	2nd	Psychometric chart and uses. , Psychometric processes
	3rd	Sensible heating and Cooling
	4th	Cooling and Dehumidification, Heating and Humidification
13TH	1st	Adiabatic cooling with humidification
	2nd	Total heating of a cooling process
	3rd	SHF, BPF, Adiabatic mixing
	4th	Problems on above,
14TH	1st	Effective temperature and Comfort chart
	2nd	Components of Air Conditioning Systems
	3rd	Factors affecting comfort air conditioning.
	4th	Equipment used in an air-conditioning.
15TH	1st	Classification of air-conditioning system
	2nd	Winter Air Conditioning System
	3rd	Summer air-conditioning system
	4th	Numerical on above

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