DE ME SEM-3 Detail Syllabus of Human Resource Management(3330001)

Teaching Scheme (In Hours)			Total Credits (L+T+P)			Examination Scheme		
Theory Marks			Practical Marks			Total Marks		
L	T	P	C	ESE	PA	ESE	PA	100
2	0	0	2	70	30	0	0	

Introduction: 1.1 Need and scope of human resource management in industrial environment. 1.2 Impact of human factors on productivity and industrial harmony. 1.3 Importance of providing need based training to the man power. 1.4 Qualities of a good supervisor

Human needs, relations and values: 2.1 Importance of human resources in Indian philosophy. 2.2 X and Y theory. 2.3 Maslow's hierarchy, its importance in managing human resources. 2.4 Need of human relations and human values in the industry, inter department and intra department. 2.5 Good relations with the suppliers and clients. 2.6 Desirable human values and their importance including ethics and morale values.

Behavioural dynamics: 3.1 Need for interpersonal competence. 3.2 Determinants of interpersonal behaviour, 3.3 Concept of interpersonal orientation and attractions and its importance in human behaviour, 3.4 Concept of group dynamics. 3.5 Dynamics of group formation. 3.6 Types of groups, 3.7 Role of teams in an organization. 3.8 Desirable characteristics of a team member. 3.9 Concept & importance of positive attitude and openness of mind. 3.10 Do's and don'ts for developing positive attitude. 3.11 Importance of mental health

Leadership Development: 4.1 Various definitions of leadership. 4.2 Situational approach to leadership. 4.3 Quality of a good leader. 4.4 Power influence and compliance. 4.5 Influence of Leadership. 4.6 Techniques to deal people effectively. - case studies. 4.7 Importance of resource management (human, machine, material, method, money, time (moment), information (message)). 4.8 Need, importance. 4.11 Need, importance and use of guidance, mentoring, coaching and counselling. 4.12 Importance of problem solving and decision making in context of productivity, quality, cost consciousness, human relations and goal achievement. 4.13 Factors affecting decision making. 4.14 Types and process of decision making. 4.15 Make the decisions for given case/situation. - case studies.

Change and stress management.: 5.1 Need for change. 5.2 Barriers to change. 5.3 Strategies and tools to manage change.(Effective implementation and management of change). - case studies. 5.4 Trade unions and their objectives. 5.5 Constructive role of trade unions in goal setting, achievement and change management, 5.6 Causes of conflicts and techniques to resolve conflicts - case studies. 5.7 Concept of stress. 5.8 Causes of stress. 5.9 Stress measuring techniques. 5.10 Need for relieving stress, 5.11 Techniques to manage the stress- case studies. 5.12 Self-management techniques

Syllabus of Manufacturing engineering-1(3331901)

Teaching Scheme (In Hours)			Total Credits (L+T+P)			Examination Scheme		
Theory Marks			Practical Marks			Total Marks		
L	T	P	C	ESE	PA	ESE	PA	200
3	0	4	7	70	30	40	60	

Introduction to manufacturing processes: 1.1 Nature, role and scope of manufacturing processes. 1.2 Role of machining, forming, casting and joining processes in manufacturing of industrial components. 1.3 Recall mechanical properties of material

Metal working processes: 2.1 Concept, principles and differences of hot and cold working processes. 2.2 Classification of forming processes. 2.3 Rolling, Forging, Spinning, Drawing, Extrusion, Swaging. i. Types. ii. Working principle. iii. Equipments used and their specifications. iv. Major parts of equipments and their construction of materials and functions. v. Process parameters. vi. ApplicationsMetal casting processes: 3.1 Basic concept of foundry process. 3.2 Types of foundries. 3.3 Pattern: i. Importance. ii. Types and materials of construction. iii. Allowances, their need and normal values. iv. Drawings and color codes. v. Making process. vi. Applications. 3.4 Cores: i. Need. ii. Types. iii. Making materials and its properties. iv. Testing methods. v. Sintering. vi. Applications. 3.5 Types, working and applications of furnaces. 3.6 Molding sand: i. Sand properties. ii. Sand mixing.iii. Sand binders. 3.7 Molding equipments, their major specifications and applications. 3.8 Types of mould, mould making, mould sintering and applications of mould. 3.9 Salvage techniques. 3.10 Recovery of sand. 3.11 Casting processes: basic principle, working, process parameters and applications. i. Centrifugal. ii. Die. iii. Investment. iv. Shell molding. 3.12 Casting defects -types, causes, effects and remedies. 3.13 Safety precautions in foundry.

Writing Skills: 4.1 Concept, basic principle, major parts, working and their materials of construction, process parameters and applications of: i. Injection moulding. ii. Blow moulding. iii. Extrusion process, 4.2 Safety precautions.

Metal joining processes: 5.1 Introduction and classification. 5.2 Welding: working principle, setup sketch, specifications of equipment and consumables, functions of each element, process parameters for various materials, applications and safety precautions for: i. Gas welding (Oxy-acetylene, Air-acetylene, oxy-hydrogen and LPG (Liquid Petroleum Gas)- oxygen. ii. Arc welding (Carbon arc, metal arc, MIG (Metal Inert Gas), TIG (Tungsten Inert Gas), flux coated arc and submerged arc). iii. Resistance welding (butt, spot, seam, projection and percussion). iv. Thermit welding. v. Forged welding. 5.3 Welding defects -types, causes, effects and remedies. 5.4 Working principle, setup sketch, specifications of equipment, tools and consumables, functions of each element, process parameters for various materials, applications and safety precautions for: i. Soldering. ii. Brazing. 5.5 Adhesive joining - process, applications. Fastening process - process, applications

Syllabus of Thermodynamics(3331902)

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	100
3	0	0	3	70	30	0	0	

Basic concepts of thermodynamics: 1.1 Introduction. 1.2 Thermodynamic systems-concept, terminology associated, classification, concept of continuum. 1.3 Thermodynamics properties & their units. 1.4 Concept of energy, heat, work and power- types & simple numerical examples. 1.5 Zeroth law of thermodynamics and its, application. 1.6 Name of various Temperature measurement devices/instruments used with related units.

First law of thermodynamics: 2.1 Joule's experiment-set up & significance. 2.2 Law of conservation of energy. 2.3 First law of thermodynamics with reference to: i. Closed system. ii. System undergoing a change of state. iii. Open system. 2.4 Energy equation & its application to: i. Non flow process. ii. Open system. iii. Steady flow (Steady flow energy equation –SFEE) 2.5 Limitations of first law of thermodynamics. 2.6 Simple numerical examples based on above.

Ideal gases and thermodynamic processes: 3.1 Various ideal gas laws. 3.2 Characteristic gas equation and Universal gas constant, 3.3 Specific heats & their relationship. 3.4 Different thermodynamic processes, their representation on P-V (Pressure-Volume) and T-s (Temperature-Entropy) diagram, 3.5 Equations for PVT relationship, work transfer, heat transfer internal energy (without derivations). 3.6 Simple numerical examples based on above

Second law of thermodynamics: 4.1 Concept and real life examples of heat source, heat sink (reservoir), heat engine, heat pump and refrigerator. 4.2 Second law of thermodynamics. i. Kelvin-Plank statement ii. Clausius statement. iii. Equivalence of above two statements. iv. Corollary. 4.3 Concept of thermal efficiency and COP (Coefficient of Performance). 4.4 Concept, importance and examples of entropy. 4.5 Concept of reversibility and irreversibility of thermodynamic processes causes of irreversibility. 4.6 Carnot cycle, representation on P-V, T-s diagrams, derivation, examples

Thermodynamic cycles: 5.1 Concept of air standard efficiency. 5.2 Otto, Diesel & Dual Combustion cycle, i. Representation on P-V & T-s diagram, derivation for air standard efficiency & simple examples. ii. Limitations, applications & comparison of above cycles based on different parameters. 5.3 Refrigeration cycles: Reversed Carnot cycle, Reversed Brayton cycle: i. Representation on P-V & T-s diagram & expression for COP (without derivation).

Syllabus of Fluid Mechanics and Htdraulic Machine(3331903)

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	150
4	0	2	6	70	30	20	30	

Fluid and fluid properties: 1.1 Concept and classification of fluid. 1.2 Properties of fluid 1.3 Newton's law viscosity. 1.4 Simple numerical examples

Fluid statics: 2.1 Laws of fluid statics. 2.2 Types, working and applications of pressure measuring devices (Manometers and mechanical gauges) with simple numerical examples. 2.3 Selection criteria for pressure measuring devices.

Fluid kinematics: 3.1 Concept of control volume. 3.2 Fluid flow i. Continuity and energy equation. ii. Momentum equations (without derivation) and its application in impact of jet.(The detail applications should be dealt in Unit VII.) iii. Types of fluid flow. iv. Flow patterns for ideal, laminar, turbulent and compressible fluid flow of one dimension. 3.3 Simple numerical problems on all of above

Fluid dynamics and flow measurement: 4.1 Fluid energy-types and interrelations. 4.2 Euler's equation. i. Concept and definition, ii. Understanding various terms in Euler's equation (No derivation). 4.3 Bernoulli's equation. i. Concept and definition. ii. Limitations and assumptions. iii. Derivation from Euler's equation. iv. Applications. 4.4 Flow measurement. i. Parameters and units of measurements related to following devices. ii. Devices- classifications, principle, working, applications without derivation. (Pitot tube, Venturi meter, Flow nozzle, Rota meter, Orifice, Notch). 4.5 Selection criteria for flow measuring device. 4.6 Simple numerical examples on all of above.

Flow through pipes: 5.1 Introduction to pipe and pipe flow. 5.2 Reynolds's experiment, friction factor, Darcy's equation, Moody's chart. 5.3 Water hammer effect. 5.4 Selection criteria for pipes and pipe sizes. 5.5 Simple numerical examples.

Hydraulic pumps & prime movers: 6.1 Concept and classification of pumps. 6.2 Detailed study(construction, working and applications) of i. Centrifugal pump. ii. Reciprocating pump. iii. Submersible pump. . Rotary positive displacement type pumps like Gear pump and Van pump. v. Vacuum pump. 6.3 Performance (efficiency, discharge, head, specific speed and power consumption) of centrifugal pump and reciprocating pump with simple numerical example

6.4 Characteristic curves of centrifugal pump and reciprocating pump. 6.5 Need for priming of centrifugal pump. 6.6 Selection of pumps.

Hydraulic prime movers (Turbine): Classification, construction, working principle and applications of: i. Pelton wheel. ii. Francis turbine. iii. Kaplan turbine. 6.8 Selection criteria of prime movers.

Hydro pneumatic elements and devices: 7.1 Types, sketch, working, specifications, symbols and applications of hydraulic and pneumatic elements like: i. Cylinder. ii. Valve. iii. Manifolds, etc. 7.2 Hydraulic devices- i. Hydraulic press. ii. Hydraulic accumulator. iii. Hydraulic lift iv. Hydraulic ram v. Hydraulic crane vi. Hydraulic coupling vii. Hydraulic intensifier. (Explain working of each with labelled schematic diagram, their specifications and Applications)

Syllabus of Strength of Material(3331904)

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	150
3	0	2	5	70	30	20	30	

DIRECT STRESS & STRAIN: 1.1 Different types of Structures and Loads 1.2 Direct Stress , linear Strain , Hook's Law Calculate Numerical on Direct Stress & Linear Strain , Stress Strain curve of Mild Steel , Modulus of Elasticity ,Yield , Breaking & Ultimate Stress and factor of Safety 1.3 Lateral Strain and Poission's ratio 1.4 Temperature Stresses & Strain with & without yielding 1.5 Shear Stress , Shear Strain & Shear Modulus 1.6 Bulk Modulus & Volumetric Strain 1.7 Differentiate Sudden , Gradual & Impact Load Strain Energy & Proof Resilience for Sudden , Gradual & Impact Load with numerical problems

MOMENT OF INERTIA: 2.1 Moment of Inertia & its Importance 2.2 Parallel & Perpendicular Axis Theorem 2.3 Formula of Moment of Inertia of solid & Hollow sections like Rectangle , Triangle , Circle 2.4 Moment of Inertia about C.G for I section , H section , Channel Section , Angle Section , T Section and Built up Section having flange plates to I & H Section and of Double Channels back to back & toe to toe

S.F & B.M IN BEAM: 3.1 Statically Determinate Beams Like Cantilever , Simply Supported & Over Hang Beam

3.2 Relation between Shear Force and Bending Moment 3.3 Sagging & Hogging Bending Moment and its importance 3.4 Point of Contra flexure & its importance 3.5 S.F & B.M Diagram for Cantilever , Simply Supported & Over Hang Beam elements like shaft , axle , spindle subjected to Point Load and/ or U.D.L

BENDING STRESSES IN BEAM: 4.1 Bending Theory Equation Bending stress , Sectional Modulus , Nutral Axis Application of Bending theory to Statically determinate beams elements like shaft , axle , spindle , pulley arm having rectangular or circular section to find out stresses

DEFLECTION OF BEAMS: 5.1 Slope & Deflection 5.2 Formulae for Cantilever Beam subjected to Point Load at free end and with full UDL 5.3 Formulae for S.S Beam subjected to Point Load at MID SPAN and with full UDL 5.4 Numerical problems on Slope and Deflection

COLUMNS & STRUTS: 6.1 Column & Strut 6.2 Short & Long Column 6.3 End Condition of Column and effective Length of Column & Modes of Failure in column 6.4 Radius of Gyration , Slenderness Ratio

6.5 Euler's Crippling Load & its numerical 6.6 Rankin's load / Buckling Load of Column / screw of screw jack & its numerical

COMBINED DIRECT & BENDING STRESSES: 7.1 Eccentricity 7.2 Formula for combined Direct & Bending Stresses 7.3 Limit of Eccentricity 7.4 Core section for Rectangular & Circular (Hollow & Solid) 7.5 Numerical on Combined Stresses for Rectangle & Circular Section

PRINCIPAL PLANE & PRINCIPAL STRESS: 8.1 Formulae for Normal , Tangential & Resultant Stresses due to Direct Orthogonal Stresses & Shear Stress 8.2 Numericals on Principal Plane & Principal Stress 8.3 Formulae for Principal Stresses and for Location of Principal Planes

TORSION: 9.1 Torsion , Angle of Twist , Polar Moment of Inertia , Torsional Rigidity 9.2 Formula of Torsional Stress 9.3 Formula for Power Transmitted / Consumed for shaft , spindle and axle of solid and hollow sections subjected to Torsion 9.4 Numericals

MECHANICAL PROPERTIES OF MATERIALS: 10.1 Various Mechanical Engineering Materials 10.2 Specifications of materials in accordance to BIS , ASME 10.3 Test Mechanical Properties like HARDNESS , IMPACT 10.4 Compare materials with their utility point of view

Syllabus of Applied Electrical and Electronics(3331905)

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	150
3	0	2	5	70	30	20	30	

Fundamentals of electrical engineering and magnetic circuit: 1.1 Electricity generation-principle, working setup, elements and their functions. 1.2 Concept of AC (Alternating Current) and DC (Direct current). 1.3 Magnetic circuit: M.M.F, magnetic force, magnetic field strength, permeability, reluctance, magnetic flux, hysteresis loop. 1.4 Magnetic field of permanent magnet and current carrying conductor, Right hand rule and Cork Screw rule.1.5 Terminologyassociated with electrical circuit: Electromotive force, current, voltage, resistance, and conductance. 1.6 Ohm's law. 1.7 AC wave cycle, instantaneous value, amplitude, frequency, time period, R.M.S. value, mean value, phase, phase difference, power factor, electric field, work, power and energy. 1.8 Concept of line value and phase value,line voltage, line current, phase voltage andphase current. 1.9 Concept of single phase and three phase supply.

Electrical components, tools and instruments: 2.1. Types, specifications, materials and applications of wires, cables and fuses. 2.2. Types, construction, symbols,materials and applicationsof switches/plugs/sockets. 2.3. Types, specifications, materials of construction and applications of various tools. 2.4. Meters: multimeter,clip-on, meter, tester, voltmeter, ammeter, energy meter, CRO- Types, specifications, materials of construction, connection method and applications

Electrical Machines: 3.1 Synchronous machines:construction andworking 3.2 Types of AC motors: Three phase and single phase- specification, construction, working, starting method, connection diagrams and applications. 3.3 Commonly occurring faults in single phase motor, three phase motor 3.4 Fractional Horse power motors - construction, working,number of inputs, number of outputs and how to connect, common troubles and remedies: i. Stepper motor ii. Servo motors.

Electrical Safety and Protection: 4.1 Earthing. 4.2 Insulation 4.3 Safety and Protection-specification, working and applications of protective devices such as fuses, MCBs and ELCBs. 4.4 Concept of optical fibre communication. 4.5 Opto-isolation for circuit safety

Electronic Components and Circuits: 5.1 Discrete electronic components: Symbols, general construction and working: Resistor, Inductor, Capacitor, Diode, Transistor, photo diodes. 5.2 Microcontrollers and PLCs (Programmable Logic Controller) - Concept, general constructional features, working and applications. 5.3 Regulated power supply, Rectifier (Half and Full wave), Uninterruptible power supply (UPS) - 5.4 Power electronic components: Symbols, general construction and working: DIAC, TRIAC, SCR, IGBT and GTO 5.5 PCB-concept and general applications. 5.6 PCBs for following applications: i. Movement of stepper motor according to input value of x, y and z coordinates. ii. Generate different time delay by 555 timers IC. iii. A circuit which latch the given input (Switch 1) and reset by another input (Switch 2). iv. Circuit to detect a given object. (Use photo diode and photo transistor).

Syllabus of Computer Aided Machine Drawing(3331906)

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	100
0	0	4	4	0	0	40	60	

Introduction: 1.1 Basic knowhow of computer hardware, software and peripherals. 1.2 Concept and need of machine drawings. 1.3 Drafting, tolerance and geometrical symbols used in machine drawing. 1.4 AutoCAD (Mechanical) screen, library, symbols, templates in context of machine drawing. 1.5 Drawing standards.(IS-696 /SP 46) (Drawing/ printing/ storage)

2D production drawings: 2.1 Simple 2D production drawings of 6-7 Mechanical components made up of minimum 5- 6 manufacturing operations using Auto CAD (Mechanical). 2.2 2D assembly productions drawing of any one simple mechanical assembly having minimum 5- 6 components each made up of 5-10 manufacturing operations using AutoCAD (Mechanical). 2.3 Take print outs of above drawings using Printer/plotter

2D parametric drawings : 3.1 Concept and examples of parametric and non parametric models. 3.2 Concept, examples and applications of constraints and relations. 3.3 Simple 2D parametric drawings of 6-7 machine components made up of minimum 5-6 manufacturing operations each using sketcher mode

Project work: 4.1 Prepare one assembly drawing having 4-5 mechanical components, draw orthographic projections of each component with Institute template and take print out of it. (Group of 5-7 students).