

ME-501-ENTREPRENEURSHIP & MANAGEMENT CONCEPT

UNIT	COURSE CONTENT
1	System Concepts: System objectives and characteristics, Interrelationship of system, subsystem & synergy ,system development, feed-back & feed-forward system, closed and open system and its control, law of Requisite Variety, System Coupling, system stress, Entropy.
2	Management: Introduction along with definition, School of Theories, function, knowledge management, E-Business, Business Environment along with significance, Organization ,Culture, Planning Hierarchy and its benefit and loss, Boston Consultancy Group Matrix, SWOT Analysis, Organization, Departmentation, Authority and responsibility, centralization and decentralization, span of control, Business Process Reengineering and its change along with barriers and remedies, Human Resource Planning, Placement, Training Principal and methods, MIS ,Personality, Attitudes ,learning process, leadership, Theories and importance of motivation.
3	Marketing: Introduction ,Holistic Marketing concept, Marketing Management, MIS ,Marketing Mix, New Product life cycle and its stages, Marketing Research Process, CRM along with phases, need and advantages, Economic Analysis of Investment, Simple Pay Back Period Method, Discounted Cash Flow Method, NPV Method, Break Even Analysis, Income Statement, Trading account, Profit and loss account, Balance sheet, Forms of Business Ownership, Private, Co-operative or Public Enterprise, stress management techniques
4	Productivity And Operations Standard of living and Happiness, Types of Productivity, Operation Management, Project planning,scheduling,controlling, Project life cycle, Program Evaluation and Review Technique and its steps, CPM and PERT, Plant Layout, Method Study, Work-Study ,TQM, Cost of quality, JIT, QFD, TPM Six sigma, Process chart.
5	Entrepreneurship Definition and concept, characteristic, comparison of entrepreneur, manager and intrapreneur, theories , Entrepreneur Traits, Role of Entrepreneur for economic growth and generation of employment and social stability, EDP

REFERENCES:

- 1-Daft R; The new era of management; Cengage.
- 2-Bhat Anil, Arya kumar; Management: Principles ,Processes and Practices; Oxford higher edu.
- 3- Davis & Olson; Management Information System; TMH.

4- Steven Alter; Information systems, Pearson, www.stevenalter.com 5- Kotler P; Marketing management;

5- Khan, Jain; Financial Management; 7- ILO; Work study; ILO.

6- Mohanty SK; Fundamental of Entrepreneurship; PHI.

ME – 502 TURBO-MACHINERY

UNIT	COURSE CONTENT
1	<p>Energy transfer in turbo machines: Application of first and second laws of thermodynamics to turbo machines, Moment of momentum equation and Euler turbine equation, Principles of impulse and reaction machines, Degree of reaction, Energy equation for relative velocities,</p>
2	<p>Steam turbines: Impulse staging: Velocity and pressure compounding, Include qualitative analysis, Effect of blade and nozzle losses on vane efficiency, Stage efficiency, Analysis for optimum efficiency, Mass flow and blade height. Reactions staging: Parson’s stages, Degree of reaction, Nozzle efficiency, Velocity coefficient, Stator efficiency, Carry over efficiency, Stage efficiency, Vane efficiency, Conditions for optimum efficiency, Axial thrust, Reheat factor in turbines, Free and forced vortex types of flow, Governing and performance characteristics of steam turbines.</p>
3	<p>Water turbines: Classification, Pelton, Francis and Kaplan turbines, vector diagrams and work done, draft tubes, governing of water turbines. Centrifugal Pumps: Classification, Advantage over reciprocating type, Definition of mano-metric head, Gross head, Static head, Vector diagram and work done. Performance and characteristics: Application of dimensional analysis and similarity to water turbines and centrifugal pumps, Selection of machines, Hydraulic, volumetric, Mechanical and overall efficiencies,</p>
4	<p>Rotary Fans, Blowers and Compressors: Classification based on pressure rise, centrifugal and axial flow machines. Centrifugal Blowers Vane shape, Velocity triangle, Degree of reactions, Slip coefficient, Vane shape and stresses, Efficiency, fan laws and characteristics. Centrifugal Compressor – Vector diagrams, Work done, Temp and pressure ratio, Slip factor, Work input factor, Pressure coefficient, Dimensions of inlet eye, Impeller and diffuser. Axial flow Compressors Vector diagrams, Work done factor, Temp and pressure ratio, Degree of reaction.</p>
5	<p>Power Transmitting turbo machines: Application and general theory, their torque ratio, Speed ratio, Slip and efficiency, Velocity diagrams, Fluid coupling and Torque converter, Positive displacement machines and turbo machines, their distinction. Positive displacement pumps with fixed and variable displacements, Hydrostatic systems hydraulic intensifier, accumulator, press and crane.</p>

REFERENCES:

1. Venkanna BK; turbomachinery; PHI
2. Csanady; Turbo machines
3. Kadambi V Manohar Prasad; An introduction to EC Vol. III Turbo machinery
4. Bansal R. K; Fluid Mechanics & Fluid Machines;
5. Rogers Cohen & Sarvan Multo Gas Turbine Theory
6. Kearton W. J; Steam Turbine: Theory & Practic

ME-503- MECHANICAL MEASUREMENT AND CONTROL

UNIT	COURSE CONTENT
1	Measurement : Significance of Mechanical Measurements, Classification of measuring instruments, generalized measurement system, types of inputs: Desired, interfering and modifying inputs. Static characteristics: Static calibration, Linearity, Static Sensitivity, Accuracy, Static error, Precision, Reproducibility, Threshold, Resolution, Hysteresis, Drift, Span & Range etc. Errors in measurement: Types of errors, Effect of component errors, Probable errors.
2	Displacement Measurement : Transducers for displacement, displacement measurement, potentiometer, LVDT, Capacitance Types, Digital Transducers (optical encoder) , Nozzle Flapper Transducer Strain Measurement : Theory of Strain Gauges, gauge factor, temperature Compensation, Bridge circuit, orientation of strain gauges for force and torque, Strain gauge based load cells and torque sensors Measurement of Angular Velocity : Tachometers, Tachogenerators, Digital tachometers and Stroboscopic Methods. Acceleration Measurement, theory of accelerometer and vibrometers, practical accelerometers, strain gauge based and piezoelectric accelerometers.
3	Pressure Measurement : Elastic pressure transducers viz. Bourdon tubes, diaphragm, bellows and piezoelectric pressure sensors, High Pressure Measurements, Bridge man gauge. Vacuum measurement : Vacuum gauges viz. McLeod gauge, Ionization and Thermal Conductivity gauges. Flow Measurement : Bernoulli's flow meters, Ultrasonic Flowmeter, Magnetic flow meter, rotameter. Temperature Measurement : Electrical methods of temperature measurement Resistance thermometers, Thermistors and thermocouples, Pyrometers. Sensitivity analysis of sensor -influence of component variation, Signal conditioning: Amplifier, Conversion, Filtering, Impedance Buffering, Modulation / Demodulation, Linearization, Grounding and Isolation.
4	Introduction to control systems, Classification of control system, Open loop and closed loop systems, Mathematical modelling of control systems, concept of transfer function, Block diagram algebra.
5	Transient and steady state analysis of first and second order system. Time Domain specifications. Step response of second order system. Steady-state error, error coefficients, steady state analysis of different type of systems using step, ramp and parabolic inputs.

REFERENCES:

1. Measurement Systems (Applications and Design) 5th ed.- E.O. Doebelin - McGraw Hill.
2. Mechanical Engineering Measurement - Thomas Beckwith, N.Lewis Buck, Roy Marangoni - Narosa Publishing House, Bombay.

3. Mechanical Engineering Measurements - A. K. Sawhney - Dhanpat Rai & Sons, New Delhi.
4. Instrumentation Devices & Systems - C.S. Rangan & G.R. Sarma - Tata McGraw Hill.
5. Instrumentation & Mechanical Measurements - A.K. Thayal.
6. Control System Engineering: by Nagrath IJ. and Gopal .

LIST OF EXPERIMENT (EXPANDABLE) :

- 1- Study of various temperature measuring devices; thermo couple, RTD, gas thermo meters.
- 2- Measuring velocity of fluid flow by Ventura meter/ orifice meter/ pitot-tube.
- 3- Measuring torque and power generated by a prime mover by using pony brake dynamometer.
- 4- Study of various pressure measuring devices like manometers, mercury in glass pressure gauge.
- 5- To develop a measuring device for fluid level measurement.

ME/AU- 504- MACHINE COMPONENT DESIGN

UNIT	COURSE CONTENT
1	Design Against Fluctuating Load : causes of stress concentration; stress concentration in tension, bending and torsion; Fluctuating Stresses, notch sensitivity, fatigue stress concentration factor, cyclic loading, endurance limit, S-NCurve, loading factor, size factor, surface factor. Design consideration for fatigue, Goodman and modified Goodman's diagram, Soderberg equation, Gerber parabola, design for finite life, cumulative fatigue damage factor.Fatigue Design under Combined Stresses
2	Design of components subject to static loads: riveted joints, welded joints threaded joints, pin, key knuckle, and cotter joints, Types of cotter Joint Dimension of Various part of the knuckle Joint ,Design procedure of pin, key, knuckle Joint ,
3	Springs: Design of helical compression and tension springs, consideration of dimensional and functional constraints, leaf springs and torsion springs; fatigue loading of springs, surge in spring; special springs,
4	Brakes & Clutches: Materials for friction surface, uniform pressure and uniform wear theories, Design of friction clutches: Disk , plate clutches, cone & centrifugal clutches. Design of brakes: Rope, band & block brake, Internal expanding brakes, Disk brakes.
5	Spur and Helical Gears: Force analysis of gear tooth, modes of failure, beam strength, Lewis equation, form factor, formative gear and virtual number of teeth; Gear materials; Surface strength and wear of teeth; strength against wear; Design of straight tooth spur and Helical Gears. Bevel Gears: Application of bevel, formative gear and virtual number of teeth; Force analysis; Lewis equation for bevel gears; Strength against wear; Design of bevel gear.

References:

1. Shingley J.E; Machine Design; TMH
2. Sharma and Purohit; Design of Machine elements; PHI
3. Wentzell Timothy H; Machine Design; Cengage learning
4. Mubeen; Machine Design; Khanna Publisher
5. Ganesh Babu K and Srithar k; Design of Machine Elements; TMH
6. Sharma & Agrawal; Machine Design; Kataria & sons
7. Maleev; Machine Design;

List of Experiment (Pl. expand it):

Designing and sketching of components contained in the syllabus

ME- 505- DYNAMICS OF MACHINES

UNIT	COURSE CONTENT
1	Dynamics of Engine Mechanisms: Displacement, velocity and acceleration of piston, turning moment on crankshaft, turning moment diagram .
2	Governor Mechanisms: Types of governors, characteristics of centrifugal governors, gravity and spring controlled centrifugal governors, hunting of centrifugal governors, inertia governors.
3	Balancing of Inertia Forces and Moments in Machines: Balancing of rotating masses, two plane balancing, determination of balancing masses (graphical and analytical methods), balancing of rotors, balancing of I.C. engine.
4	Friction: Frictional torque in pivots and collars by uniform wear and uniform pressure Boundary and fluid film lubrication, friction in journal and thrust bearings, rolling friction .Clutches
5	Belt : Belt drives; Velocity ratio, limiting ratio of tension; power transmitted; centrifugal effect on belts, maximum power transmitted by belt, initial tension, chain and rope drives; Brakes: Band brake, block brakes, Internal and external shoe brakes, braking of vehicles. Dynamometer types and uses. Analysis of Cams, Response of un-damped cam mechanism

REFERENCES:

- 1 Rattan SS; Theory of machines; TMH
- 2 Dr.R.K.Bansal& Dr.Brar; Theory of Machines LP
- 3 Ghosh and Mallik; Theory of Mechanisms and Machines; Affiliated East-West Press, Delhi
- 4 Norton RL; kinematics and dynamics of machinery; TMH
- 5 Grover; Mechanical Vibrations
- 6 Theory of Vibrations by Thomson

List of Experiment (Expandable)

- 1- Study of various models of governors.
- 2- Study of gyroscopic motion and calculation of value of gyroscopic couple.
- 3- Study of various types of Cams and followers and drawing the cam profile with the help of test kit.
- 4- Study of various first order vibration systems.
- 5- To study working of friction clutches using models

ME- 506 – RDBMS

UNIT	COURSE CONTENT
1.	Introductory concepts of DBMS: Introduction and applications of DBMS, Purpose of data base, Data Independence, Database System architecture- levels, Mappings, Database users and DBA, Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships.
2.	Relational Model: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension
3.	Entity-Relationship model: Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema.
4.	Relational Database design: Functional Dependency – definition, trivial and non-trivial FD, closure of FD Set, Closure of attributes, irreducible Set of FD, Normalization – 1NF, 2NF, 3NF, Decomposition using FD, dependency preservation, BCNF, Multi- valued dependency, 4NF, Join dependency and 5NF.
5.	Relational Query languages & SQL: Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union, Data definition in SQL, update statements and views in SQL QUEL & QBE, Data storage and definitions, Data retrieval queries and update statements.

REFERENCES:

1. Elmasri, Navathe, “Fundamentals Of Database Systems”, Addison Wesley
2. Korth, Silbertz, Sudarshan, “Database Concepts”, McGraw Hill
3. Toledo; Data base management systems;TMH
4. Panneeselvam “Database Management System” PHI
5. Date C J, “An Introduction To Database System”, Addison Wesley

6. Ashutosh Kumar Dubey “Data Base Management Concepts” Katson Publication

LIST OF EXPERIMENTS:-

1. Study of DBMS, RDBMS and ORDBMS.
2. To study Data Definition language Statements.
3. To study Data Manipulation Statements.
4. Study of SELECT command with different clauses.
5. Study of SINGLE ROW functions (character, numeric, Data functions).
6. Study of GROUP functions (avg, count, max, min, Sum).
7. Study of various type of SET OPERATORS (Union, Intersect, Minus).
8. Study of various type of Integrity Constraints.
9. Study of Various type of JOINS.
10. To study Views and Indices.