CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C G)

Scheme of Teaching and Examination

B.E. VI SEMESTER MECHANICAL ENGINEERING

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Periods per week</th>
<th>Scheme of Exam</th>
<th>Total Marks</th>
<th>Credit</th>
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<tr>
<td>1</td>
<td>Mech. Engg.</td>
<td>337611 (37)</td>
<td>Machine Design - II</td>
<td>4</td>
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<td>2</td>
<td>Mech. Engg.</td>
<td>337612 (37)</td>
<td>Turbo Machinery</td>
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<td>Machine Tool Technology</td>
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<td>Industrial Engineering</td>
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<td>6</td>
<td>Refer Table</td>
<td>Professional Elective - I</td>
<td>4</td>
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<td>80</td>
<td>20</td>
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<td>7</td>
<td>Mech. Engg.</td>
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<td>Machine Design - II Lab</td>
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<td>8</td>
<td>Mech. Engg.</td>
<td>337622 (37)</td>
<td>Energy Conversion Systems Lab</td>
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<td>Industrial Engineering Lab</td>
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<td>Computer Aided Design Lab</td>
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<tr>
<td>11</td>
<td>Management</td>
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<td>Managerial Skills</td>
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<td>Total</td>
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L – Lecture, T – Tutorial, CT – Class Test, ESE- End Semester Exam, TA – Teacher’s Assessment

Note: Industrial Training of twelve weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part must have been completed in summer after IV sem. The second part to be completed during summer after VI sem, after which students have to submit a training report which will be evaluated by college teachers during B.E. VII sem.

Table - 1

Professional Elective-I

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Branch</th>
<th>Subject Code</th>
<th>Subject</th>
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<tr>
<td>1</td>
<td>Mechanical</td>
<td>337631 (37)</td>
<td>Fluidics &amp; Hydraulic Control</td>
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<tr>
<td>2</td>
<td>Mechanical</td>
<td>337632 (37)</td>
<td>Automatic Control</td>
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<td>3</td>
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<td>337633 (37)</td>
<td>Engineering Economics</td>
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<td>4</td>
<td>Mechanical</td>
<td>337634 (37)</td>
<td>Composite Materials</td>
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<td>5</td>
<td>Mechanical</td>
<td>337635 (37)</td>
<td>Power Plant Engineering</td>
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<tr>
<td>6</td>
<td>Mechanical</td>
<td>337636 (37)</td>
<td>Maintenance and Reliability</td>
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<tr>
<td>7</td>
<td>Mechanical</td>
<td>337637 (37)</td>
<td>Tribology</td>
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</table>

Note (1) – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a particular academic session.

Note (2) – Choice of elective course once made for an examination cannot be changed in future examinations.
UNIT – I
Spring
Spring materials and their mechanical properties, equation for stress and deflection, helical coil springs of circular section for tension, compression and torsion, dynamic loading, fatigue loading, Wahl line, leaf spring and laminated spring.

UNIT – II
GEARS
Spur Gears
Gear Drives, Classification of Gears, Selection of Type of Gears, Law of Gearing, Force Analysis, Gear Tooth Failures, Selection of Material, Number of Teeth, Face Width, Beam Strength of Gear Tooth, Effective Load on Gear Tooth, Estimation of Module Based on Wear Strength, Lewis equation, Gear Design for Maximum Power Transmitting Capacity, Gear Lubrication.

UNIT-III
Helical Gears
Helical Gears, Terminology of Helical Gears, Virtual Number of Teeth, Tooth Proportions, Force Analysis, Beam Strength of Helical Gears, Effective Load on Gear Tooth, Wear Strength of Helical Gears.
Bevel Gears:
Bevel Gears, Terminology of Bevel Gears, Force Analysis, Beam strength of Bevel Gears, Wear Strength of Bevel Gears, Effective Load on Gear Tooth.

UNIT – IV
BEARINGS
Rolling Contact Bearings
Types of ball and roller bearings, selection of bearing for radial and axial load, bearing life, Mounting and lubrication, shaft scales – contact type and clearance type.
Journal Bearings
Types of lubrication, viscosity, Hydrodynamic theory of lubrication, Sommerfield number, heat balance, self-contained bearings, bearing materials.

UNIT – V
Clutches
Friction clutches, Friction materials, Torque transmitting capacity, Single & Multiple plate clutch, centrifugal clutches.
Belt and Rope Drive:
Flat and V-belts, belt constructions, geometrical relationships for length of the belt, analysis of belt tensions, condition for maximum power, selection of flat & V-belts, adjustment of belt tensions, Wire ropes, stresses in wire ropes.

TEXT BOOKS
1. Design of Machine Elements from V.B. Bhandari, TMH Publications.

REFERENCE BOOKS
UNIT – I
Impulse Turbine

UNIT – II
Impulse Reaction Turbine
Velocity diagram, degree of reaction, impulse-reaction turbine with similar blade section and half degree of reaction. (Parson’s turbine) Height of reaction turbine blading section internal losses in steam turbine Nozzle, Losses, blade friction losses, disc friction losses, blade windage losses or partial admission losses, gland leakage or clearance losses, leaving velocity or residual loss, carry loss.

UNIT – III
State Point Locus and Reheat Factor
Factor-Stage, efficiency of impulse turbines, stage point locus of an impulse turbine, state point locus for multistage turbine reheat factor. Internal efficiency, over all efficiency, relative efficiency, Governing of steam turbine. Throttle governing, nozzle governing, bypass governing, combination of throttle and nozzle, governing and combination of bypass and throttle governing. Effect of governing on the performance of steam turbine.

UNIT – IV
Gas Turbine
Classification of gas turbine. Simple open cycle gas turbine Ideal and actual cycle (Brayton Cycle) for gas turbine Optimum pressure ratio for maximum specific output in actual gas turbine Regeneration, reheat and inter cooling and effect of these modification on efficiency and output, closed cycle gas turbine.

UNIT – V
Turbo Compressors
Introduction, classifications of Centrifugal compressors – components, working, velocity diagrams, calculations of power and efficiencies. Slip factor, surging and choking power and efficiencies. Axial Flow Compressor Construction and working, velocity diagram, calculation of power and efficiencies. Degree of reaction, work done factor, stalling, comparison of centrifugal and axial flow compressor.

TEXT BOOKS
1. Steam and Gas turbine – By R. Yadav - Central Publishing House, Allahabad
2. Gas Dynamics with Application: S.K. Kulshrestha

REFERENCE BOOKS
1. Turbine compressors and Fans – S.M. Yahya - TMH
2. Gas Turbine – V. Ganeshan – TMH
UNIT – I

Propulsion Devices
Types of jet engines, Ram Jet, pulse jet, Turbojet, Turbo propulsion, principle and operation. Energy flow through jet and variation of pressure and temperature, thrust equation, specific thrust and velocity of fluid. Thermodynamics of turbojet, efficiency & performance, parameters affecting performance, after burn, Injection of water & alcohol mixture.

UNIT – II

Rocket Propulsion
Basic theory, Physics equations, classifications, types of rocket engines, liquid propellant rockets, efficiency and performance, orbital & escape velocity application of space flight.

UNIT – III

Non-Conventional Energy Conversion
Classical sources of energy crisis and search for alternative sources of energy. Solar energy, earth sun angles, resolution, solar measurement, collection of solar energy, flat plate and focusing collector analysis, calculations and same design parameters. Applications of solar energy. Introduction to Photovoltaic cell energy conversion techniques.

UNIT – IV

Bio-Mass
Gasifiers, Gobar Gas plant, types of applications, Biomass conversion technologies, biogas Generation.

Wind Energy
Basic principles of wind energy conversion, wind energy estimation, site selection consideration, basic components of wind energy conversion system, classification, advantages & disadvantages of WECS.

UNIT – V

Additional Alternate Energy Sources & Improved Energy Utilization
Fuels cell technology, wave energy conversion, tidal energy conversion, OTEC. Principle of MHD power system, types of MHD system, advantages, materials for MHD system. Geothermal energy, nature of geothermal fields, Geothermal sources, prime movers for geothermal energy, advantages, disadvantages of Geothermal energy over other energy forms, its application.

High pressure boiler
Modification in Boiler, High Pressure Steam generators – La-Mont, Benson, Velox and Schmidt Hartmann Boilers.

TEXT BOOKS
2. Gas Dynamics & Space Propulsion – N. Shanmugam, M. Palani – Anuradha Agencies

REFERENCE BOOKS
1. Fundamental of Compressible Fluid Dynamics – P. Balachandran – PHI
5. Solar Energy, R Sukhatme,
UNIT - I
Cutting Tool – types, requirements, specification & application
Geometry of Single Point Cutting Tool - tool angle, Tool angle specification system, ASA, ORS and NRS and
inter-relationship.
Mechanics of Metal Cutting
Theories of metal cutting, Chip formation, types of chips, chip breakers, Orthogonal and Oblique cutting, stress and
strain in the chip, velocity relations, power and energy requirement in metal cutting.

UNIT - II
Machinability
Concept and evaluation of Machinability, Mechanism of Tool failure, Tool wear mechanism, Tool life, Tool life
equation, Machinability index, factors affecting machinability.
Thermal Aspects in Machining and Cutting Fluid
Source of heat in metal cutting and its distributions, temp measurement in metal cutting, function of cutting fluid,
types of cutting fluid.

UNIT – III
Design of Machine Tool Element
Design of Lathe bed, Material and construction feature, various bed section, analysis of force under headstock, tail
stock and saddle, torque analysis of lathe bed, bending of lathe bed, designing for torsional rigidity, use of
reinforcing stiffener in lathe bed.
Design of Guide ways, Material and construction features, over turning diagram, Antifriction guide ways.

UNIT – IV
Design of Speed Gear Box
Drives in Machine Tool, classification, selecting maximum and minimum cutting speeds, speed loss, kinematic
advantage of Geometric progression, kinematic diagrams, design of Gear Box of 6,9,12 and 18 speed.

UNIT – V
Design of Feed Gear Box
Elements of feed gear box, classification-Norton drive, draw key drive, Meander’s drive, Design of feed gear box for
longitudinal and cross feed and for thread cutting.
Machine Tool Installation and Maintenance
Machine Tool installation, Machine Tool Maintenance, lubrication, reconditioning of machine tool.
Machine Tool Testing
Testing, Geometrical checks, measuring equipment for testing, acceptance test for Lathe and Radial drilling
machines.

TEXT BOOKS

REFERENCE BOOKS
2. Production Technology – R.K. Jain – Khanna Publisher – New Delhi
Minimum number of class tests to be conducted: 2

UNIT – I
Introduction
History & development, system approach, relationship with other departments. Objective of Industrial Engineering, Place of Industrial engineering in an organization, related discipline, management, OR, statistics, ergonomics, manufacturing engineering.

Plant Location
Need for a suitable location, urban, suburban, systems approach, factors affecting location, quantitative method for evaluation of plant location.

Plant Layout
Objective & Principles, factors affecting layout, types of layout.

UNIT – II
Work Study
Purpose, objectives and applications of work study, Productivity and work study.

Method Study
Introduction, procedure, charts, man-machine, flow process charts, motion economy principles, micro motion study - Therbligs, cyclegraph.

Work Measurement
Definition, types, selection & timing the job, rating, allowances, Normal and standard time determination, work sampling

UNIT -III
Job Evaluation & Merit Rating
Definition, objectives, methods, job rotation, job enlargement, job enrichment.

Wages & Incentives
Terminology, characteristics, factors, types of incentives, wage incentive plan, Rowan plan, Taylor’s differential piece rate system, Emerson’s efficiency plan, Halsey’s 50-50 plan, Bedaux plan, Group task & Bonus system.

UNIT – IV
Information systems in organizations
Role id IS in Industry, increasing value of Information Technology, Internet worked enterprise, Internet, Intranet and Extranet, Globalization and IT, competitive advantage with IT.

Business Process Re-Engineering
Definition, need & characteristics, Industrial Engineering & Re-engineering, advantages of re-engineering.

UNIT V
Maintenance Management
Objectives and need for maintenance, types of maintenance, breakdown, predictive and preventive maintenance

Equipment replacement policy
Reasons for replacement, deterioration, obsolescence, depreciation, method for depreciation calculation

Value Engineering & Value Analysis
Objectives & scope, application & techniques.

TEXT BOOKS
1. Industrial Engineering & Management –A new perspective, Philip E Hicks, Mcgraw Hill

REFERENCE BOOKS
1. Industrial Engineering and Production Management – Martand Telsan – S. Chand & Company
2. Motion & Time Study – Mundel - PHI
4. Motion and Time Study – Ralph M. Bannes – John Wiley & Sons
8. Handbook of Industrial Engineering – Grant & Grant – PHI
UNIT-I
Fluidics
Technology, Terminology, types of fluid logic elements, amplifiers, logic states, methods of obtaining input signals and power outputs, application of fluidics, third generation fluidics.

UNIT – II
Fluid Power System
Components, advantages, applications in the field of Machine Tools, material handling, presses, mobile and stationary machines, clamping & indexing devices etc., transmission of power at static and dynamic states.

Hydraulic Fluid
Types of hydraulic fluids, properties of fluid, selection of fluids, JIC/ISO symbols for hydraulic circuits.

UNIT – III
Pumps
Types, classification, principle and working of vane, gear, radial and axial plunger pumps, power and efficiency calculations, selection of pumps for hydraulic transmission.

Actuators
Linear and rotary actuators, hydraulic motor types & construction methods of control of acceleration, types of cylinder and mountings, calculation of piston velocity, thrust under static and dynamic application.

UNIT – IV
Control of Fluid Power
Principle, working types of the following valves, pressure control, direction control, flow control, relief valves, sequence values etc.

UNIT – V
Hydraulic Circuits
- Meter in, meter out circuits
- Pressure control for cylinders
- Flow divider circuits
Circuit illustrating use of pressure reducer valves, sequence valve, counter balance valves, unloading valves with the use of electrical control, accumulators etc.

Accumulators and Intensifiers:
Types, function, application, selection and design procedure.

TEXT BOOKS
1. Hydraulic Machines including fluidics – Dr. Jagdish lal, Metropolitan Book Company pvt. Ltd., New Delhi
2. Introduction to Fluid Power – Sahastrabadhe – Nirali Prakashan, Pune

REFERENCE BOOKS
1. Industrial Hydraulics – Pipenger & Hicks, Mc Graw Hill Company, New York
2. Fluid Power – Goodwin

Subject:      Automatic Control        Code: 337632 (37)
Total Theory Periods:  50      Total Tutorial Periods:  12
Total Marks in End Semester Exam:  80
Minimum number of class tests to be conducted: 2
UNIT – I
Fundamentals of Instrumentation
Block diagram of automatic control system. Static and dynamic characteristics of instruments. types of errors and sources of errors. Comparison of hydraulic and pneumatic and electronic systems. Servomechanism.

UNIT - II
Transducers
Classification and selection of transducers. Application of transducers for measurement of parameters like displacement, velocity, acceleration, shock, pressure, flow level, Measurement of force and torque. Introduction to noise measurement.

UNIT - III
Fundamentals of control systems
Close loop and open loop control systems. Feed back, feed forward control systems for position, flow and temperature. Delays in process.

UNIT - IV
Control Valves
(a) Types of control valves, characteristics of proportional control valves (spool valves). Application of control valves.
(b) Actuators - Principle and types of actuators such as electrical, pneumatic, hydraulic, electro-pneumatic and electro-hydraulic. Study of Hydraulic and pneumatic control systems.

UNIT - V
PLC
Introduction, Micro PLC, Programming a PLC, Logic Functions, input & output Modules, PLC Processors, PLC Instructors, Documenting a PLC System, Timer & counter Instructions, Comparison & data Handling instructions, Sequencing Instructions, Mask Data representation, Typical PLC Programming Exercises for Industrial Applications.

TEXT BOOKS
2. Principles of Industrial Instrumentation - Pattarnabis - (IMH)

REFERENCE BOOKS
2. Process Control hand Book - BG Liptak – Chilton
3. Computer based Industrial control - Krishna Kant – PHI

Subject: Engineering Economics                               Code: 337633 (37)
Total Theory Periods: 50                                     Total Tutorial Periods: 12
Total Marks in End Semester Exam: 80                      Minimum number of class tests to be conducted: 2
UNIT-I
Introduction & Scope
Engineers and Economics, Utility of its study, Managerial Economics, Nature and scope, basic terms and concept of economics like goods, kinds of goods, utility, value and wealth.
Theory of Demand and supply, Elasticity of demand.
Meaning, Characteristics, Objectives of Firm, Managerial and behavioral theories of a firm.

UNIT – II
Pricing and Market Competition
Industrial Establishments, various types of industrial establishments, Sole traders, partnership, joint stock company, types of shares, financial goals of organization.
Pricing Perspective approach: Pricing policy and price influencing factors, Basic data for price fixation.
Market forms & Competition – Pure and perfect competition, monopoly, monopolistic competition, price determination under perfect and monopolistic competition.

UNIT – III
Economy, Monetary & Fiscal Policy
Balance of payments – money and monetary policy, fiscal policy, Inflation, measuring employment and unemployment. Credit policies
Concept and measurement of national income.

UNIT – IV
Cost and Costing Factors
Cost Analysis – Types and Elements of cost, cost planning and control.
Relationship between Average cost & Marginal cost, Short run and long run average cost curves.

UNIT – V
Depreciation & Capital Budgeting
Depreciation and its methods of calculation, marginal costing, break – even analysis, profit planning and forecasting, Capital budgeting, cost of capital, Appraising projects profitability.

TEXT BOOKS
1. Managerial Economics – P.L. Mehta – S. Chand and sons

REFERENCES
3. Managerial Economics – Mote and Paul - TMH
4. Macro Economics for management Students – A. Nag - Macmillan India Ltd
6. Managerial Economics - G.S. Gupta – TMH
9. Managerial Economics – Joel Dean - PHI

Subject: Composite Materials Code: 337634 (37)
Total Theory Periods: 50 Total Tutorial Periods: 12
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2
UNIT - I
Introduction
Definition of composite and their characteristics, polymeric materials, fiberous materials, polymeric composites,
Review of force tensors, stress tensors, strain tensors

UNIT - II
Material Properties:
Anisotropic materials, properties relating stress to strain, properties relating temperature to strain, properties relating
moisture to strain, properties relating stress (or strain) to failure

UNIT - III
Elastic Response of Anisotropic Material:
Hooke’s Law, stress and environmental effects, unidirectional composite laminates; Hooke’s law - referenced to
principal material coordinate system; Hooke’s law - referenced to arbitrary coordinate system, effective engineering
properties

UNIT - IV
Multi-angle Composite Laminates:
Thin-plate theory, classical lamination theory, effective elastic engineering properties

UNIT - V
Manufacturing and testing: Moulding, pultrusion, filament winding, quality inspection methods, uniaxial tension
test, uniaxial compression test-in plane shear test, fracture toughness testing of composites

TEXT BOOKS
   York
2. Fiber reinforced Composite materials: Manufacturing and design – P.K. Mallick - Marcel Dekker Inc

REFERENCE BOOKS
1. Primer on composite Materials analysis – J.C. Halpin - Techomic publishing Co
2. Composite Materials Technology; Processes and Properties – P.K. Mallick and Newman - Hansen Publisher,
   Munich

Subject: Power Plant Engineering Code: 337635 (37)
Total Theory Periods: 50 Total Tutorial Periods: 12
Total Marks in End Semester Exam: 80
Minimum number of class tests to be conducted: 2

UNIT-I
Elements of Power Plant
General Sources of power, Importance of Central Power Stations, types of power stations – steam, nuclear, diesel and hydro – Elements of modern power stations (Steam only): brief layout and arrangement of elements and complements, sitting of different power stations, foundation. Elements of Electric power systems primary and secondary distribution substations (in brief).

UNIT – II
Steam Power Plant
Steam power plants selection of working medium, Heat Balance in stem cycles, Heat rates, comparison of efficiencies gas loop, fuels and fuel handling. Equipments, fuel gas cleaning and ash handling. Air pre-heater, feed water pre-heaters, steam re-heaters, dearators, feed water treatment, pumping and regulation water walls, modern developments in steam boilers, Important instrumentation and piping of gas and water loop. Factors to be controlled from maximum efficiency and variable output.

UNIT – III
Hydro Electric power station – Potential power with reference to rainfall and catchments area, Water storage, equipment used in hydro electric power stations. Characteristics of hydraulic turbines. Comparison of the factors governing the cost of hydro steam and diesel power stations.
Diesel power station – Suitability of diesel engines for bulk power, advantages and limitations of diesel, power stations, efficiency and heat balance.

UNIT – IV
Nuclear Power Station
Evolution of nuclear energy from atoms by fission and fusion. Chain reactions, fission materials, types of reactors, gas cooled, boiling water liquid, metal cooled and fast reactor, arrangements of various elements in a nuclear power station, stem cycles and boilers coolant heat exchangers, Reactor control, Reactor shielding and safety methods.

UNIT – V
Variable load problems – Idealized and realized load curves, effect of variable load on plant design and operation variable load operation and load dispatch.
Power station Economics – Source of income, cost of plant and production, elements of cost, depreciation and replacement theory of rates.

TEXT BOOKS

REFERENCE BOOKS
Objective and functions, organization and administration, economics and maintenance policies. Types of maintenance systems-planned, unplanned, preventive, predictive, conditional monitoring, total predictive maintenance.

UNIT – II
Failure Analysis
Analysis of source identification, classification and selectivity of failures, catastrophic, wearout and cumulative failures, failure rate Mortality distribution, statistical and reliability concept of failure analysis, equipment replacement policy.

UNIT – III
Reliability Engineering
Concept, bath tub curve, elements, Hazard Models- constant, linearly increasing, weibull. System Reliability - Series configuration, parallel configuration, mixed configuration, reliability improvement – Improvement of components, Redundancy – element, unit, standby, repairable and non repairable systems, reliability, availability, maintainability, MTBF, MTTR, reliability allocation for simple series system.

UNIT – IV
Maintenance Management
Maintenance planning, maintenance scheduling, work orders, work measurement, maintenance cost budgeting, store and spare control, maintenance planning and control techniques, Incentives for maintenance work.

UNIT – V
Maintenance of Mechanical System

TEXT BOOKS

REFERENCE BOOKS
3. Concept in Reliability – LS. Srinath – Affiliated East-West Press, New Delhi
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Nominal life, static and dynamic capacity, equivalent load, probabilities of survival, cubic mean load, bearing mounting details, preloading of bearings, condition monitoring using shock pulse method.

UNIT - II
Hydrodynamic bearings

UNIT - III
Hydrostatic bearings
Dry rubbing bearings
Porous metal bearings and oscillatory journal bearings, qualitative approach only.

UNIT - IV
Lubrication
Choice of lubricant type, oil, grease and solid lubricants, additives, lubrication systems and their selection, selection of pump, filters, piping design, oil changing and oil conservation.

UNIT - V
Seals
Different types, mechanical seals, lip seals, packed glands, soft piston seals, mechanical piston rod packing, labyrinth seals and throttling bushes, oil flinger rings and drain grooves, selection of mechanical seals.
Failure of tribological components
Failure analysis of plain bearings, rolling bearings, gears and seals, wear analysis using SOAP and Ferrography.

TEXT BOOKS
2. Engineering Tribology – Prasanta Sahoo - PHI

REFERENCES BOOKS

EXPERIMENTS TO BE PERFORMED
Each student shall submit two-assembly design report along with the drawing for assembly/sub assembly for any mechanical system consisting of not less than four machine elements included in the syllabus.
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Subject: Energy Conversion Systems Lab Code: 337622 (37)
Total Practical Periods: 28 Total Marks in End Semester Exam: 40

EXPERIMENTS TO BE PERFORMED (MINIMUM TEN Experiments)

1. Determination of Mechanical and volumetric efficiency of Reciprocating Air Compressor.
2. Testing of Reciprocating Air Compressor.
11. Study and Performance of La-Mont Boiler
12. Study and Performance of Benson Boiler
13. Study and Performance of Velox Boiler
14. Study and Performance of Simple Steam Turbine

LIST OF EQUIPMENTS/MACHINES REQUIRED

1. Reciprocating air compressor test rig
2. Axial flow compressor with flow discharge tunnel.
3. Flat plate solar collector with solar pump.
4. Focusing type parabolic solar collector.
5. Modified conjugate electrical backup type solar collector.
7. La-Mont boiler model.
8. Benson boiler model.
9. Velox boiler model.
10. Experimental setup of Simple Impulse Turbine.

Subject:   Industrial Engineering Lab  Code: 337623 (37)
Total Practical Periods: 28  Total Marks in End Semester Exam: 40

EXPERIMENTS TO BE PERFORMED (MINIMUM TEN EXPERIMENTS)

1. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method -men type flow process chart.
2. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method -material type flow process chart.
3. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method - machine type flow process chart
4. To prepare the charts & diagrams for a selected problem according to the existing method and an improved method – multiple activity chart.
5. Study of principles of fundamentals of hand motion.
6. Study & applications of principles of motion economy.
10. Calculation of allowance for a job.
13. Case study of an industrial/service organization using a method study techniques.

Subject: Computer Aided Design Lab                          Code: 337624 (37)
Total Practical Periods: 28                                 Total Marks in End Semester Exam: 40

EXPERIMENTS TO BE PERFORMED (MINIMUM TEN NUMBERS)

1. Introduction to integrated development environment of AutoCAD release 2000 or higher version
2. Basic drawing commands example: - LINE, POLYLINE, MULTILINE, POLYGON, CIRCLE, ELLIPSE, etc.
3. Basic editing commands e.g. - COPY, MOVE, ROTATE, MIRROR, CHAMFER, FILLET and array command as well as zoom and pan command.
4. Text command, TEXT, DTEXT, MTEXT.
5. Creation and insertion of blocks
6. Concept of layers and view ports
7. Creation of assembly drawing of stuffing box using above commands.
8. Dimensioning of stuffing box and showing the assembled view and its components in different view ports.
11. Conversion of assembly drawing of stuffing box from 2D to 3D.
12. Placement of 3D assembly drawing of stuffing box and placing views in different view ports

LIST OF EQUIPMENTS/MACHINES REQUIRED
P-IV (IBM) 2.6 GHz, 80 GB HDD, 256/512 SD RAM (Compatible with CAD Software), 52 X CD RW, 1.44 MB FDD, 17” Colour Monitor, Laser Scroll Mouse

Unit-I
Managerial Communication Skills: Importance of Business Writing: writing business letters, memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication- presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.
Unit-II
Managerial skills: Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brainstorming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive.

Unit-III
Proactive Manager: How to become the real you: The journey of self-discovery, the path of self-discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self assessment.

Unit-IV
Attitudinal Change: Meaning of attitude through example, benefits of positive attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate?

Unit-V
Creativity – a managerial skill, Trying to get a grip on creativity.

Text & Reference Books:
1. Basic Managerial skills for all by E.H. McGrawth, Prentice Hall India Pvt Ltd, 2006
2. How to develop a pleasing personality by Atul John Rego, Better yourself bools, Mumbai, 2006
3. The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
4. How to Success by Brian Adams, Better Yourself books, Mumbai, 1969