DME-501 PRODUCTION PROCESS ESTIMATING & COSTING

UNIT:-I

Selecting and Planning the Process of Manufacture: Introduction to planning Function, fundamental rules for the manufacturing process, basic design of product, influence of process engineering on product design, rechecking specifications, how materials selected affect process cost, using materials more economically, material cost balance sheet, eliminating operations, combined operations, selecting the process tooling, availability of equipment, make or buy decisions.

Unit:-II

Elements of Costs and their Allocation : Definition and objective of Estimating & costing, desirable conditions for a costing system, advantages of costing, elements of cost, , direct material cost, direct labour cost, direct expenses, prime cost overheads, indirect materials, indirect labour, indirect expenses administrative and selling expenses, analysis of total cost fixed cost and variable cost. Break even analysis

UNIT:- III

Depreciation: Definition & Concept, causes of depreciation methods of depreciation calculation.
Profit: Profit methods of increasing profit, effects of the methods on production, market and sales.
Budget : Definition, departmental budget and purpose of budgetary control.

UNIT:- IV

Actual Cost Estimation: Process Materials and Manpower - Terminology associated with estimation, Calculation of volume, weight and cost of materials.

UNIT:- V

Welding shop- process, materials and Man-power Gas and Arc. Welding terminology, production operation time, labour cost, materials cost, cost elements, batch production cost.

Foundry Shop: Process, Materials and Man- power - Pattern cost, production time for casting, material cost of casting, moulding cost, batch production time.

REFERENCE BOOKS

1 Cost Control by G. R. Sharma. (National Productivity Council)
2 Engineer' s Glude to Costing (Institute of cost works Accounts)
3 Mechanical Estimating And Costing by T.R. Banga and & S. C. Sharma (Khanna Pub.)

4 Mechanical Estimation and Costing by R.L. Shrimali & P.C. Jain (Jain Pub. House)
5 Yantriki Abhiyantriki Abhikalpan (Hindi) by K. D. Saxena. (Deepak Prakashan, Morar, Gwalior) .

DME-502 INDUSTRIAL ENGINEERING

UNIT:-I

Productivity: Production and productivity, production systems and their impact on productivity, its significance and benefits of higher productivity. Long term and short term factors affecting productivity, productivity cycle.

UNIT:-II

Work Study: objectives and application of work study, basic procedure and techniques of work study . Human factors in work study. Role of manager, supervisor and workers.

Method Study: Definition objectives, basic procedures of methods study. Recording techniques, operation process chart, flow process chart, machine chart, flow diagrams, string diagrams, two hand process charts, questioning technique procedure to develop, install and maintain new methods. Principles of Motion Economy **.**

UNIT:-III

Material Handling and Plant Layout : Importance and its effects on productivity, requirements of good material handling system, classification and selection of material handling equipment. Requirements of good layout. Effect of bad layout, Factors affecting plant layout, types of layout, advantages and limitations of each type of layout selection of layout, factors affecting the plant location.

UNIT:-IV

Statistical Quality Control: Definition of quality and total quality,

Control Charts for Variables: Statistical basic for control Charts for variables, construction of X and R Charts- their interpretation, use of X and R chart in establishment of process capability.

Control Charts for Attributes: Limitation of X and R charts, Meaning and use of attributes, their advantages, Calculation, construction, interpretation and application of p- chart, c- chart, ph-chart.

UNIT:-V

Job Evaluation, Wages and Incentives: Definition, need and scope of job evaluation. Job evaluation systems and their comparative merits and demerits and limitations, Wages and Incentives. PMTS , MOST .

REFERENCE BOOKS

1 Introduction To Industrial Engineering by Philip Hicks (McGraw Hills)
2 Productivity Means Property (Asian Productivity Organization, Tokyo)
3 Introduction To Work Study (International Labour Office)
4 Audyogiki Abhiyantran (Hindi) by J.C. Varshneya. (Deepak Prakashan, Gwalior)
5 Audyogik Engineering (Hindi) by K.D. Saxena . (Deepak Prakashan, Gwalior)

DME-503 MACHINE TOOL TECHNOLOGY

UNIT:-I

Introduction : Concept of machine tool technology, **Metal Cutting Theory** : Stages in cutting, factors affecting cutting, types of chips, Tool geometry and influence of tool angles, desirable properties of cutting tool materials and their influences on the choice of tool material. Tool geometry and influence of tool angles, desirable properties of cutting tool materials and their influences on the choice of tool material.

UNIT:-II

Lathe: Basic difference between center, turret and Capston lathes, constructional details and specification. working principles , different operations on lathe,

Shaper, Drilling & Boring Machine: Construction, operation. application,

UNIT:-III

Milling Machines: Define milling, Classification of milling machines, Principles, parts and their functions, methods of mounting the cutter, work holding devices, dividing heads, simple and differential indexing,

Grinding Machines : types of abrasive materials and their properties, methods of dressing and tracing, Principles of working of grinding machines , functions of tool and work holding devices , Types of lubricants and coolants used in grinding, honing and lapping processes

UNIT:-IV

Special purpose Machines: Difference between forming and generation of gears, principle of gear shaping, hobbing and shaving, rate of production accuracy and limitations. Thread production : thread rolling and thread milling. Broaching Machines : Definition of Broaching, types of broaches, broaching machines, advantages and limitations.

UNIT:-V

Machine Tool Drives : Requirements of machine tools, elements of machine tools and their purpose Drive Systems : Stepped and step less drives, advantages and limitations of the gear box drives, function of feed box, types of feed gear boxes, working and advantages. Principle of straight line motion, multihandle, single lever and pre-selective control system, Jigs and Fixtures **.**

LIST OF EXPERIMENT:

1. Demonstration of formation of chips on a lathe, continuous, discontinuous and fractured by changing variables like rake angle, speed feed and depth of cut.
2. Demonstration of built up edge on the finished tool point by changing speed and depth of cut while machining on a mild steel bar.

3. Grinding of single point (H.S.S.) tools.
4. Practice of taper turning and screw cutting on a center lathe .
5. Practice of drilling, boring and reaming on a lathe.
6. Surface grinding or tapping on a flat surface.
7. Study of special purpose machines using web aid .

REFERENCE BOOKS :

1. Workshop Technology Vol. I & II by Hajra Chaudhary, (Media Promoters & Publishers Pvt. Ltd. Mumbai)
2. Workshop Technology Vol. I , II and III by W.A.J. Chapman, (ELBS)
3. Manufacturing Processes & Systems by Phillip F. Ostwald & Jairo Minoz (John Willey & Sons.)
4. Production Technology by R. K. Jain (Khanna Publishers, Delhi).
5. Vijayvargiya P.N."Machine Tool" Shilp Vigyan (Hindi)
(Deepak Prakashan, Morar Gwalior .)

DME-504 MECHANICAL MEASUREMENT & MAINTENANCE

UNIT:- I

General Measurement Concept: Limits, fits and tolerances, selection of fit, calculation of fundamental deviation, tolerance and limits, selection of limits, tolerances and allowances.

UNIT:-II

Linear Measurement: Working of vernier callipers, micrometers, vernier height gauge, dial vernier and dial height gauge, finding least count, precautions. Dial gauge, comparators - mechanical, electrical, optical and pneumatic comparators.

Angular Measurement: Protractor, angle gauges, Sine bars, spirit levels, clinometers

UNIT:-III

Straightness, Flatness, Squareness and Roundness Testing: Straight edge method, light gap and feeler gauge method, wedge method, use of V- Block and dial indicator for checking roundness.

Surface Roughness: Working principle of Tomlinson mechanical surface finish recorder.

Screw Thread Measurement: Equipment required for measuring pitch.

UNIT:-IV

Limit Gauges: Definition of gauge and gauging, necessity of gauging in industrial practice, screw pitch gauge, template feeler gauge, working tolerance of gauges, maximum and minimum metal conditions to tolerance. Taylor's principle for design of ' Go ' and ' No Go' gauges . Calculation of gauge dimensions form formula given in IS 3455 and selection of parameters necessary for calculation.

UNIT:-V

Introduction to Plant Maintenance: Introduction to maintenance, its need and scope, functions of the maintenance department. Different maintenance practices, procedure of corrective or break down maintenance, scheduled maintenance, preventive maintenance and predictive maintenance, methods of keeping records for condition of equipment, maintenance and replacement of parts, standard data for maintenance form, time standards (time to complete the maintenance job).

LIST OF EXPERIMENT:

1. Study of different type of fits with their practical application
2. Measurement of diameter, length, thickness etc. Using different calipers and steel rule.
3. Measurement of various parameters of different objects using vernier caliper & Micro-meter .
4. Measurement of various parameters of different objects using combination set.

5 Measure of unknown angle with the help of a sine bar and a slip gauge set.
6 Measure different angles using angle gauges.
7 Check for flatness, and parallelism of an object using a dial indicator and surface plate.
8 Maintance practice on lathe and shaper m/cs .

REFERENCE BOOKS :

1. Engineering Metrology. by R.K. Jain (Khanna Pub. Delhi)
2. Engineering Metrology. by I.C. Gupta (DANPAT RAI & SONS)
3. Inspection & Gauging by Kennedy (The Industrial Press, 93, Wortinstreet, New york)
4. Mechanical & Industrial Measurement R.K. Jain (Khanna Publishers New Delhi)
5. Industrial maintenance – H.P. Garg (S. CHAND & Company Ltd)
6. Maap Vigyan Avum Yantrikaran (Hindi) by Yogendra Varshneya. (Deepak Prakashan, Morar,Gwalior)
7. Sanyantra Anurakshan Avum Suraksha Abhiyantriki (Hindi) by Yogendra Varshney (Deepak Prakashan, Morar, Gwalior)

DME-505 POWER PLANT ENGINEERING

UNIT:-I

Introduction : Methods of converting various energy sources to electric power, direct conversion methods renewable energy sources, solar, wind, tidal, geothermal, bio-thermal, biogas and hybrid energy systems, fuel cells, thermoelectric modules, MHD-Converter.

UNIT:-II

Fossil fuel steam stations: Basic principles of sitting and station design, effect of climatic factors on station and equipment design, choice of steam cycle and main equipment, fuel handling, burning systems, element of feed water treatment plant, condensing plant and circulating water systems, cooling towers, turbine room and auxiliary plant equipment., instrumentation, testing and plant heat balance.

UNIT:-III

Hydro-Power Station: Elements of Hydrological computations, rainfall run off, flow and power duration curves, mass curves, storage capacity, salient features of various types of hydro stations, component such as dams, spillways, intake systems, head works, pressure tunnels, penstocks, reservoir, balancing reservoirs, Micro and pico hydro machines, selection of hydraulic turbines for power stations, selection of site.

UNIT:-IV

Nuclear Power Station: Review of atomic structure and radio activity, binding energy concept, fission and fusion reaction, fissionable and fertile materials, thermal neutron fission, important nuclear fuels, moderators and coolants, their relative merits, thermal and fast breeder reactors, principles of reactor control, safety and reliability features.

UNIT:-V

POWER STATION ECONOMICS: Estimation and prediction of load. Maximum demand, load factor, diversity factor, plant factor and their influence on plant design, operation and economics; comparison of hydro and nuclear power plants typical cost structures.

References:

1- Nag PK; Power plant Engg; TMH

2- Al-Wakil MM; Power plant Technology; TMH

3- Sharma PC; Power plant Engg; Kataria and sons, Delhi

4- Domkundwar; Power Plant Engg; Dhanpatrai & sons.

5- Rajput RK; A text book of Power plant Engg.; Laxmi Publications.

6- Yadav R; Steam and gas turbine and power plant engg by

LIST OF EXPERIMENT:

1) Study of simple power plant
2) Study of solar water heating system
3) Study of wind power generation plant
4) Study of biogas plant
5) Study of hydraulic power plant.