

DCM 401

ORGANIC PROCESS TECHNOLOGY

Unit I

Soaps and detergents, Glycerol recovery, sulphated fatty alcohols and alkyl – aryl sulphonates.

Unit II

Important features of Indian sugar industry, Alcohol fermentation, Pollution problems. Kraft and Sulphite pulping methods, Semi-chemical pulping, Pulp and paper, pulping process

Unit III

Important petrochemicals, cracking, alkylation-dealkylation and hydroalkylation, halogenation, oxidation, hydrogenation-dehydrogenation; hydration-dehydration.

Unit IV

Basic principles of polymerization reactions, polyethylene, polystyrene and PVC, Rubbers, their classification and processing, Dyes and Dye intermediates, insecticides and pesticides.

Unit V

Natural and synthetic fibres, Fibre spinning processes: melt, dry and wet spinning, nylon-6 and nylon-66, polyester fibres, polyamides, acrylics, cellulose and acetate,

References:

1. Dryden C.E; Outlines Of Chemical Technology; Affiliated. East West press, New Delhi, 1997
2. G.T. Austin, Shreve's Chemical Process Industries, Mc Graw Hill.
3. Gupta VB & Kathari VK; Manufacturing Fibre Technology; Chapman Hall, Newyork I Edition
4. Kathari V.K.; Progress In Textile, Sciences Technology, Vol I & II; IAFL Publications, S-351 Greater Kailash part I New Delhi – 48 I Ed.
5. Austin, G.T; Shreeves Chemical Progress Industries; . Mc. Graw Hill New York

DCM-402

MATERIAL SCIENCE

Unit I

Introduction: Introduction to material science, Properties and behavior of materials useful in structure, machines and equipment, Structure- Crystal Geometry and Structure, Structure determination X – ray diffraction, Braggs Law.

Unit II

Atomic arrangements in material and imperfections. Structure of atom, Crystal Imperfections: Point Imperfections, Line imperfections- edge and screw dislocations, Surface imperfections.

Unit III

Phase Diagram And Phase Transformations: Phase rule, Single component systems, Nucleation and growth, Deformation of Materials- Fracture: Elastic deformation, Plastic deformation, Creep, Visco-elastic deformation, Different types of fracture.

Unit IV

Heat Treatment: Annealing, Normalizing, Hardening, Quenching, Tempering, Corrosion And Prevention: Direct Corrosion, electro-chemical corrosion, Galvanic cells, High-temperature corrosion, factor influencing corrosion rate, Control and of corrosion-modification of corrosive environment, Inhibitors.

Unit V

Typical Engineering Materials: Nonferrous metals – Copper, Aluminum, Lead, Chromium, Tin, Brass, and Zinc and its alloy, Non-metals – Glass, Enamels, Chemical stone wares.

References:

1. Van Vlack; MATERIAL SCIENCE
2. WOOLEF; VOL. 1,2,3,4.
3. Perry RH & Don WG; PERRYS CHEMICAL Engineering HAND BOOK; McGraw Hill.
4. Murthy; Structures and properties of Engg Materials; TMH
5. Narula; Material science; TMH
6. Vijaya; Material Science; TMH
7. O.P. Khanna; MATERIAL SCIENCE & METALLURGY; DhanpatRai Publication.
8. S.K. HajraChoudhry; MATERIALS SCIENCE & PROCESSES; Indian Book Distrib

LIST OF EXPERIMENT

1. To study crystal structures of a given specimen.
2. To study crystal imperfections in a given specimen.
3. To study microstructures of metals/ alloys.
4. To study heat treatment processes (hardening and tempering) of steel specimen.
5. To study microstructure of heat-treated steel.
6. To study the mechanism of chemical corrosion and its protection.

DCM-403
ENVIRONMENTAL ENGINEERING

Unit I

Nature of environment, environmental degradation, environmental impact assessment, national environmental policies, environmental guidelines for process industries, environmental pollution and its effect on human beings, animal and vegetation system.

Unit - II

Air Pollution: Sources and effect of air pollution, classification of air pollutants, emission standard of air pollution. Meteorological condition influencing air pollution, Chemical inversion.

Unit -III

Water Pollution: Sources and effect of water pollution, water born diseases, classification of water pollutants, physical, chemical and bacteriological analysis of water; pollution laws and limits.

Unit - IV

Pollution due to Solid Waste and Noise: Nature of domestic, municipal, agricultural, industrial, Nuclear Wastes; collection, treatment and disposal of solids waste; waste recovery system, solid waste management.

Unit - V

Case study with respect to fertilizer industry, refinery and petrochemical industries, pulp and paper industries, sugar and alcohol industries.

References:

1. Rao C S; Environmental Pollution Control Engineering; New Age India Ltd.
2. Mahajan S P; Pollution Control in Process Industries
3. Canter Lary; Environmental Impact Assessment; TMG
4. Keily; Environmental Engineering; TMG
5. Miller GT Jr; Environmental sciences-working with earth; Cengage Pub

List of Experiments

1. To determine the BOD of a given water Sample.
2. To determine the D O of a given water Sample.
3. To determine the COD of a given water Sample.
4. To determine the pH value of a given water Sample.
5. To determine the Chlorides in a given water Sample.
6. To determine the Acidity in a given water Sample.
7. To determine the Alkalinity in a given water Sample.
8. To determine the Total Hardness in a given water Sample.
9. To determine the Turbidity of a given water Sample.
10. To determine the Total dissolve solid of a given sample.

DCM-404
PLANT ECONOMICS MANAGEMENT AND OPTIMIZATION
Unit I

Introduction: Basic considerations in chemical engineering plant design, optimization and feasibility of plant design.

Unit II

Selection of process equipment's: Standard versus special equipment-material of construction for process equipment's, selection criteria, and specification sheets. Cost estimation: Cash flow and cumulative cash position for industrial operations, factors affecting estimation of investment and production cost, breakeven point and its significance, total capital investment, fixed and working capital investment & their estimations, type of estimates, cost indexes, method for estimating capital investment.

Unit III

Estimation of total product cost: Estimation of total product cost: manufacturing cost, general expenses, Manufacturing cost: direct production cost, fixed charges, plant overhead cost.

Unit IV

Profitability, alternative investments and replacement: Methods for profitability evaluation, Evaluation of Break Even Point, % rate of return, Practical factors in alternative investment and replacement Studies.

Unit V

Project management: Planning of project schedule by BAR CHART, Inventory control scheduling a project using CPM/PERT methods. Depreciation: Types of depreciation, Method for determining depreciation: straight line method, decline balance method, sum of the year digit method, shrinking fund method etc, single unit and group depreciation, adjustment of depreciation account, evaluation of depreciation methods.

Reference Books:

1. M.S. Peters and Timmerhaus, "Plant design and Economics for Chemical Engineers", McGraw Hill 3rd Edition.
2. F.C. Vibrandt and C.E. Dryden, "Chemical Engineering Plant Design", McGraw Hill Fifth Edition.
3. Coulson & Richardson's Chemical Engineering Volume 6, Butterworth-Heinemann, 1999, 3rd Edition
4. Industrial Engineering and Management by O. P. Khanna, Dhanpat Rai & Sons, 1985 7th Edition.
5. Project Engineering: Suhas Mokashi, Mcmillan Publisher.

Practical: Design any plant and perform the economic and optimization studies

DCM-405
(A)ENTREPRENEURSHIP

Unit – 1

Introduction: Meaning and Importance, Evolution of term ‘Entrepreneurship’, Factors influencing entrepreneurship’, Psychological factors, Social factors, Economic factor, Environmental factors, Characteristics of an entrepreneur, Entrepreneur and Entrepreneur

Unit – II

Types of entrepreneur: According to Type of Business, According to Use of Technology, According to Motivation, According to Growth, According to Stages, New generations of entrepreneurship viz. social entrepreneurship, Health entrepreneurship, Tourism entrepreneurship, Women entrepreneurship etc., Barriers to entrepreneurship.

Unit – III

Entrepreneurial Motivation: Motivation, Maslow’s theory , Herjburg’s theory, McGragor’s Theory, McClelland’s Need – Achievement Theory, Culture & Society, Values / Ethics, Risk taking behavior.

Unit – IV

Creativity: Creativity and entrepreneurship, Steps in Creativity, Innovation and inventions, Using left brain skills to harvest right brain ideas, Legal Protection of innovation, Skills of an entrepreneur, Decision making and Problem Solving (steps indecision making).

Unit – V

Organization Assistance: Assistance to an entrepreneur, New Ventures, Industrial Park (Meaning, features, & examples), Special Economic Zone (Meaning, features & examples), Financial assistance by different agencies, MSME Act Small Scale Industries, Carry on Business (COB) license, Environmental Clearance.

Reference Books:

1. Nieuwenhuizen, Basics of Entrepreneurship, Juta and Company Ltd,
2. David Stokes, Nicholas Wilson, Martha Mador, Entrepreneurship, Cengage Learning EMEA.
3. Mark Casson, Bernard Yeung, Anuradha Basu, The Oxford Handbook of Entrepreneurship, Oxford University Press, 2008.

DCM-405
(B) MARKETING MANAGEMENT

UNIT I

Salesmanship: Meaning, Definition, Characteristics, Concept, Kinds, Nature, Evolution, and Psychology in Selling, Scope, Limitations and Importance; Sales Management: Meaning, Definition, Characteristics, Principles, Functions and Importance, Difference between Sales Management and Marketing Management.

UNIT II

Salesman: Types, Qualities, Objectives, Duties and Responsibilities of Good Salesman, Recruitment, Selection and Training of Salesman: Sources of Recruitment, Principles of Selection, Selection Procedure, Meaning, Advantages, Disadvantages, Methods, Principles and Limitation, Subject Matter and Types of Good Training Programme.

UNIT III

Remuneration/ Compensation: Essentials of Good Remuneration Plan, Objectives, Methods, Factors determining Remuneration Plan, Comparative study of various plans. Motivating Sales Force: Meaning, Definition, Objectives, Importance and Methods.

UNIT IV

Sales Planning: Meaning, Components, Elements, Types, Importance and Limitations, Sales Fields or territories: Meaning, Definition, Objectives, Factors determining Size, Allocation of Sales territories, Steps in setting Sales territories.

UNIT V

Consumer Behaviour: Meaning, Definition, Variables and Factors affecting Consumer Behaviour. Buying Motives: Meaning, Kinds, Chief Buying Motives, Different Types of Consumers, Behaviour and Customer Service.

Reference Books:

1. Santoki, Sales Management, Kalyani Publisher
2. Gupta, S.L., Sales and Distribution Management, Excel Books, New Delhi, 2008
3. Still, R., Richard, Sales Management, Pearson Prentice Hall, Delhi
4. Schiffman, Kanuk, Kumar, Consumer Behaviour, Pearson, Tenth Edition
5. Kotler, Keller, Marketing Management, Pearson Publications