SEMESTER-IV
M 4 IC 01 CT 11

Textile Chemistry

Time: 3 Hrs. **M.M. 80 marks**
Credits: 4

Unit-I

Historical development of natural and synthetic dyes, dyestuff industries in India, classification of dyes according to chemical constitution, method of preparation of nitroso, nitro, azo dyes, pyrazolone, acridine, ketoamine, anthraquinones, azines, thiazines, oxazine, Indigo, thio indigo alizarine and various dyes.

Unit-II

Chemical bond their role and involvement in dyeing of different textile materials, role of chemical bonds in colour fastness of dyes, physical and chemical principals involved in the application of dyestuff e.g. direct, basic, acid, vat, disperse, azioc, pigments dyes etc.

Unit-III

Evalution of textile chemicals axilary's VIZ detergents, wetting agents, cross linking agents, softners, stiffeners, silicone emulsions. Study of various method of dyeing, various form of dyes and their application.

Unit-IV

Isolation of products for manufacturing of dye intermediates, dyes intermediate related to hydroxy, helogencompounds and heterocyclic compopunds general method of nitration of toluene phenol, aniline, naphthalene series. Chemistry of benzene and naphthalene with their orientation. General method of dye sulphonation of benzene and aniline, napthalenes, napthols, sulphonic acid, General method of amination of nitro compounds and naphthalene series.

Unit-V

Relation between colour and chemicals constitution, substantively and chemical constitution, chemistry of various types of pigments fluorescent brightening agents and miscellaneous dyes. Toxicity of dyes and dyes intermediates.

Books recommended:

1. Technology of dyeing , V.A. Shehnai vol-6
2. Textile chemistry, R.H. Peter, Vol-3
3. Evalution of textile chemicals, V.A. Shhnai vol-8
4. Theory of coloration of textiles C.L Bird

SEMESTER-IV
M 4 IC 02 CT 12

Effluents treatment and waste management

Time: 3 Hrs. **M.M. 80 marks**
Credits: 4

Unit-I

Industrial Pollution; Introduction, principal causes of industrial pollution, environmental problems of caustic-chlorine industry, thermal power plants, nuclear power reactors, fertilizers and chemical industries, tanner industries, agro based industries, pulp and paper industry, distillery industry, plastic industry, detergent industry, sponge iron industry.

Unit-II

Industrial waste and treatment processes: Introduction, types of industrial wastes, principal of industrial waste treatment, protection of biosphere and surface water from industrial waste, treatment and disposal industrial waste, treatment of waste or effluents with organic impurities and inorganic impurities, effluents of industrial unit and their purification, treatment of some industrial pollutants.

Unit-III

Environmental toxicology: Introduction, Route and mechanism of toxicant entry to organism, Distribution of toxicants with within the toxicants, biotransformation of toxicants, excretion of toxicants, classes of poisons based on effect, quantitative principals of toxicology, Experimental testing for toxicity.

Unit-IV

Radioactive pollution: Source of radioactive pollution, natural and anthropological radioactive pollution, classification and effect of radiation, harmful effects of various radiations, protection and control from radiation, types of radioactive waste, disposal method of radioactive waste, radioactive waste detector.

Unit-V

Waste management ; Introduction, Municipal waste and environment, Land filling , Incineration, dioxins, disposal of medical waste, emmunisation waste, electronic waste, paper waste and their recycling, Reed bed system.
Management of hazardous chemicals: Introduction, brief idea of sampling and monitoring, techniques for chemical analysis, quality assurance and quality control.

Books recommended:
1. Environmental chemistry, B.K. Sharma, Goel publishing house
2. Basic concept of environmental chemistry, D.W. Connell, CRC, Taylor & francis

SEMESTER-IV
M 4 IC 03 ET 16

Agro based Chemicals

Time: 3 Hrs. **M.M. 80 marks**
Credits: 4

Unit-I

Paper and Pulp Industries: Manufacture of pulp, mechanical and chemical pulping, manufacturing of paper.

Oil/fats/Wax/Soaps: Fatty acids and triglycerides, Saturated and unsaturated fats, hydrogenation, polymerization, rancidity of oils, fat analysis, Butter, margarine and mayonnaise, Waxes: Their types and applications, Soap and soap manufacture, Hard and soft soaps, Disadvantages of soaps over synthetic detergents.

Unit-II

Fermentation industry: Anaerobic and aerobic fermentation production of antibiotics acids (lysine,glutamic acid), alcohol, acetone, butanol, lactic acid, citric acid, vitamins and enzymes, brewing industry.

Perfumes: Introduction of perfumes and perfumery chemicals, theory of olfaction and mechanism, classification of perfumes, Essential oils and their isolation, Some important terpenes and esters, Flavors, synthesis of civetone and Muskone, relation between perfumes and pheromones.

Unit-III

Surfactants: Classification with example, adsorption micelle formation, manufacture of anionic, cationic, zwitterionic and nonionic detergents, applications in industries. Application as foaming agent, wetting agents, Dispersant, solublizers, emulsifiers and rheology modifiers, detergents formulations, detergents, biodegradation, biosurfactants**.**

Unit-IV

Pesticides: Introduction, classification, synthesis of few common pesticides of chlorinated (DDT, BHC, chlordane, aldrin), organophosphorus and carbamate (parathion, malathion, carbaryl) compounds family, Plant Pesticides, pesticide formulations.

Unit-V

Food and dairy chemistry: Composition and chemistry of cream, butter, ghee, ice-cream, cheese, condensed and dried milk, infant food, spoilage of ghee and use of antioxidant, chemistry

of milk fermentation, chemistry of rennin coagulation of milk and changes occurring during ripening of cheese, physicochemical changes in manufacture and storage of milk powder lactose, crystallization and its significance, physicochemical changes during the manufacture of indigenous milk product, quality standard of dairy product.

SEMESTER-IV
M 4 IC 04 ET 17

Fuels, Petroleum and petrochemicals

Time: 3 Hrs. **M.M. 80 marks**
Credits: 4

Unit-I

Introduction of fuel, Calorific value, determination of CV, Modern concept of fuels. Classification of fuels, criteria of selection of fuel, methods of processing of various fuels.

Unit-II

Coal & coal chemicals: Origin of coal, types of coal and their purification, recovery of coal chemicals, process of combination products, fractional distillation of coal tar, uses of tar & tar products.

Unit-III

Petroleum: Origin, distribution, process of production, composition, classification and distillation of crude petroleum.

Unit-IV

Processing of liquid fuels such as petroleum and petroleum products.

Unit-V

Manufacture of following compounds: Methane, ethylene, acetylene. Preparation of the following from methane, methanol. Hydrogen cynaide, carbondisulphide. Preparation of following from ethylene, Ethyl chloride, ethanol, ethylene oxide, ethylene glycol ,acetic acid, styrene, vinyl acetate, benzene, Xylene, acrylonitrile, butandionols etc. Various crystals used in petrochemical industry, preparation, applications and selectivity.

SEMESTER-IV
M 4 IC 05 ET 18

Medicinal Chemistry-II

Time: 3 Hrs. **M.M. 80 marks**
Credits: 4

Unit-I

Drugs: Structurally specific and non-specific drugs, Thermodynamic activity, Various theories, Meyer overtone and Hemmi theory, Fergusen theory, Cutt of point , steric factor, Verloop steric parameter, Carig plot and Topliss scheme, ADME concept, Molecular modeling and drug design.

Unit-II

General Anesthetics: Classification , Various theories for mode of action of general anesthetics.

Local Anesthetics: Chemical classification, lofgrens classification.

Anti-inflammatory drug: NSAIDS, classification, Structure, Synthesis and mode of action of Ibuprofen, Diclofanac sodium, Indemethacin, Naproxen, Pyroxicam.

Unit-III

Anticonvulsants: Troxidone, Phensuximide , Phenytoin and their mode of action.

Antianxiety drug and Tranquilizers: Diazepam, Metaxalone tybamate chlorpromazine hydrochloride and their mode of action.

Unit-IV

Diuretics: Mericurial and non-mericurial diuratics, Merallurice mercaptomerin chlorothiazide and their mode of action.

Antiparkinsonian agents: Classification, Biperiden, Procyclidine, Benztropine mesylate, Levodopa and their mode of action.

Unit-V

Antineoplastic agents: Chemotherapeutic intervanation, Classification, Alkylating agents, methane sulphonates, Ethylenimines, Nitrosaureas, Azothiopurines, Cylarabine, Flurouracil, Vinblastin.

Antithyroid drugs: Classification and mode of actions. Prostaglandins and their bio-activity.

SEMESTER-IV

M 4 IC 05 CP 06

(Practical-A-IV**)**

Credits 4; Time 8h **M.M. 100**

80 marks (External)
20 marks (Internal)

1 Volumetric analysis of ternary mixture of inorganic salts, like Bi^{+3} Pb^{+2} Cd^{+2} etc.
2 Study of specific rotation of drug molecules
3 Estimation of metals (Pb^{+2}, Cd^{+2}, Cu^{+2}, Hg^{+2} , As^{+2} etc.) using AAS
4 Study of DC polarography / Cyclic voltametery of metals (Pb^{+2}, Cd^{+2}, Cu^{+2}, Hg^{+2} , As^{+2} etc.)
5 Column chromatographic separation of organic mixture and natural products

Solvent extraction

1 Uranyl nitrate from thorium nitrates with the help of tributyl phosphate
2 Separation of metal from a mixture
3 Study of the solvent extraction of Hg and Al with 8-hydroxyquinoline.

SEMESTER-IV

M 4 IC06 EP 02

(Practical-B-IV**)**

Credits 4; Time 8h **M.M. 100**

80 marks (External)
20 marks (Internal)

Spectrophotometric estimation of drugs like:

1 Ciprofloxacin
2 Rifampicin
3 Metronidazole
4 Tinidazole
5 Paracetamol
6 Diclofenac sodium
7 Valsartin
8 Ketoprofen
9 Ibuprofen
10 Sodium chloride
11 Ambroxol
12 Sildenafil
13 Lacipidine
14 Tobramycin
15 Propantheline bromide
16 Clarithromycin
17 Efavirenz
18 Drotavarine
19 Pravastatin sodium

Formulation of pharmaceutical dosage forms like Suspensions, Emulsions, Creams, Ointments, Tablets and Capsules.