M.Sc. (Industrial Chemistry) IVth Semester

IC 401 - IPR, TQM & TECHNOLOGY MANAGEMENT

UNIT – I

UNIT – II
IPR, management of IPR, various IPR, Viz. copyrights and traditional knowledge, patents, condition of patentability, steps to obtain a patent, source of patent information, infringement analysis, recent changes in IPR and brief idea about various patent policies and practices.

UNIT – III
Concepts of ISO, Total Quality Management (TQM), Six Sigma, Kaizen, JIT, Total Quality Control (TQC), Total Waste Elimination (TWE), Total Productive Maintenance (TPM).

UNIT – IV
Concepts and guidelines of USFDA, Good Manufacturing Practices (GMP), GPC, ICH guidelines, research methodology used in CRO.

UNIT – V
Technology Management: Basic concepts, role and importance to technology management, Technological change, and Technology life cycle, diffusion and growth of Technology. Technology planning, Technology dev. and strategies, Technological forecasting, Technology generation and development and Technology transfer. Organization for technology at enterprise level.
IC 402 - ADVANCED INSTRUMENTAL TECHNIQUES

UNIT - I
Thermoanalytical Methods: thermogravimetry, factors affecting thermogravimetric curves, derivative thermogravimetry (DTG), thermobalance. Applications of thermogravimetry, differential thermal analysis, factors affecting DTA curves, instrumentation; application of DTA.
Differential scanning colorimetry (DSC), theory, instrumentation, applications of DSC, thermometric titrations, principal classification. Instrumentation and application of thermogravimetric titrations and online analysis.

UNIT - II
Electro analytical methods:
Electrogravimetric analysis, theory, apparatus cell process, deposition and separation.
Electrolytic separation of metals.
Coulometry, apparatus and general techniques controlled potential coulometry.
Potentiometry – Fundamentals, reference electrodes (Hydrogen, calomel, silver and silver chloride electrode).
Indicator and ion selective electrode, instrumentation and measurement of cell and emf conductance and conductometric titrations

UNIT - III
UNIT – IV

Refractometry, Polarimetry, Fluorescence and Phosphorance spectrometry. Optical Rotatry dispersion (ORD) and circular dichroism (CD) theory, instrumentation and application of above techniques.

UNIT – V

Surface characterization by spectroscopy and microscopy, Introduction, surface scanning electron microscopy, scanning probe microscope. Supercritical fluids chromatography and extraction Properties of super critical fluids, super critical fluids chromatography and super critical fluids extraction
UNIT – I


UNIT – II


UNIT – III


UNIT – IV


Hydrolysis: Hydrolysing agents, kinetic mechanism and thermodynamic of hydrolysing equipments for hydrolysis. Typical industrial hydrolytic reaction.

UNIT – V

Alkylation: Types of alkylation, alkylating agents, factor controlling alkylation. Kinetics and mechanism, some industrial alkylating process.

UNIT – I

Petroleum: Constituents of Petroleum, Processing or Refining, Petrochemicals, Feedstock’s, Petrochemicals from methane, ethylene, propylene, butylenes and cyclic ring. Manufacture of petrochemical by chemical conversion.

UNIT – II

Oils: Edible and nonedible oils, chemical composition and physical properties of vegetable oils, Method of extracting oils, Hydrogenation of oils.

UNIT – III

Soaps and detergents: Cleaning agents, Soaps, manufacture of soaps, Glycerin, Methods of production of glycerin, Detergents, manufacture of various kinds of detergents, cleaning action of soaps and detergents, Use Pattern, Soapification value, Acid values, Iodine value, Titer, Rosin value, Total fatty matter.

UNIT – IV


UNIT – V

UNIT – I

Drugs acting on CNS:

(a) Introduction, site and mechanism of action of some neurotransmitters NA, Dopamine, 5H.T., acetyl choline, GABA, Histamine.

(b) General and Local anaesthetics. Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Ether, Halothane, Nitrous Oxide, Chloroform, Thiopentone sodium, Ketamine hydrochloride, Lignocaine hydrochloride, cinchocaine, phenacainie HCl, Ethyl- p-amino benzoate.

UNIT – II

a) Sedatives and hypnotics: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Barbiturates (Barbiton, Phenobarbital, Allobarbital, Thiopental sodium), Benzodiazepines (Diazepan, buspirone) and alcoholic hypnotics (Ethyl Alcohol, methylparafynol, Ethchlorvynol)

b) Tranquilizers or Antianxiety Agents: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Reserpine, Chlorpromazine, Haloperidol, Benzodiazepines.

UNIT – III

(a) Anticonvulsants and Antiepileptic drugs: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Phenobarbital, Phenytoin Sodium, Trimethadione, Phensuximide, Primidone.

(b) CNS stimulants: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Caffeine, Theophylline, Doxapram, Cocaine.

(c) Hallucinogens: Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Lysergic acids, Diethylamide, $^9\Delta$ Tetrahydrocannabinol.
UNIT– IV

a) **Antiseptic and Disinfectants:** Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Potassium permanganate, Hydrogen peroxide, Chlorhexidine, Cetrimide, ethanol, formaldehyde, glutaraldehyde, silver nitrate, silver sulfadiazine, gentian violet, acriflavine.

b) **Ectoparasiticides:** Classification, pharmacology, mode of action, adverse effects, synthesis and structure activity relationship of Benzyl benzoate, Lindane.

c) Principles of Toxicology and General Treatment of Poisoning

UNIT – V

**DRUG DESIGN**

a) **A rational approach:** Analogues and prodrugs, concepts of lead, factors governing drug design, rational approach of drug design, research and development strategies, tailoring of drugs.

b) **Physical – Chemical factors and biological activities:** Physical properties, factor governing ability of drugs to reach active site, dissociation constants, isoterism and bio-isoterism.