Status of pharmaceutical industries in India.
Project formulation, evaluation and implementation.
Pharmaceutical Factory Planning and layouts, preparation of flow diagrams, technical data sheets.

Material management: Basic principles of Material Management, Purchase, Store and Inventory control.

**Pharmaceutical Production Management**: Different aspects of Production Management, Performance Evaluation Technique, flow-process, know how process and maintenance.

**Pharmaceutical Economics**: Principles of economics with special reference to the laws of demands and supply, demand schedule, demand curves, general principles of insurance and inland and foreign trade, procedure of exporting and importing goods.
Pharmaceutical Marketing: Functions, wholesale, retail, and mail order business, market research.
**Pharmaceutical Salesmanship**: Principles of sales promotion, advertising, and ethics of Sales, merchandising, Window display and literature detailing.

**BOOKS RECOMMENDED:**
Pharmaceutical Analysis II - PY 602

The theoretical aspects, basic instrumentation, elements of interpretation of spectra and pharmaceutical application of the following analytical techniques –

1. Chromatography: Paper Chromatography TLC, GLC, HPTLC and HPLC.
2. Ultraviolet and visible spectrophotometry: Beer-lambert law, electronic transitions, instrumentation, methods, chemical derivatisation, structural analysis, applications.
4. Fluorimetry.
5. Mass Spectroscopy: Introduction, ionization techniques, mass analyzers, fragmentation rules, instrumentation, the mass spectrum & its applications.
6. NMR Spectroscopy: Introduction, continuous-wave (CW) NMR spectrometry, pulsed fourier transform spectrometry, chemical shift, spin coupling, spin decoupling & its applications.
7. Atomic Absorption.
10. Immunoassay techniques: Enzymes & radioimmunoassay techniques, theory, methods & its applications.

BOOKS RECOMMENDED:

5. Higuchi, J. and Hansen E.B., Pharmaceutical Analysis, Interscience Publisher John Willey and Sons, New York, Sydney.
7. Willard, Merritt and Settle, Instrumental Methods of Chemical Analysis,CBS Publisher and Distributors, New Delhi.
8. Ewing, G.W., Instrumental Methods of Chemical Analysis.,
LIST OF PRACTICALS:

1. Determination of solvent cut off value of different solvents.
2. Study of effect of various solvents on spectral features of any drug.
3. Perform the quantitative spectrophotometric estimation of drug by single point method.
4. Perform the quantitative spectrophotometric estimation of drug by calibration curve method.
5. Perform the quantitative spectrophotometric estimation of drug by standard absorptivity method.
7. Simultaneous quantitative spectrophotometric estimation of two drugs by dual wavelength method.
8. Simultaneous quantitative spectrophotometric estimation of two drugs by derivative spectroscopy.
9. To determine the tablet content of norfloxacin by hydrotrophy.
10. Interpretation of given IR spectra.
11. Quantitative estimation of alprazolam (Any drug) by RP-HPLC.
12. Simultaneous quantitative estimation of torsemide and spironolactone (Combination of two drugs) by RP-HPLC.
PHARMACEUTICAL CHEMISTRY – VII PY-603 (MEDICINAL CHEMISTRY-II)

( I ) Classification and mode of action, uses, structure activity relationship including physicochemical, steric aspects and recent advances in research of the following categories of drugs:

(A) Drug Acting on CNS
- General Anesthetics: Stages of Anesthesia, Pharmacokinetic Principles, Theories of the mechanisms.
- Antiscizure agents: Drugs effective against partial and generalized tonic-clonic seizure.
- Opiod Analgesics: Endogenous opioid peptides and their physiologic functions, Neurobiology of drug abuse and addiction.
- Antiparkinsonian and Spasmolytic agents: Pharmacotherapy of Parkinsons disease.
- Hallucinogens, Stimulants, and related drugs of Abuse.
- Psychopharmacological Agents: Antipsychotic agents, Antidepressants, Anxiolytics.

(B) Drug Acting on GIT :
- Laxative
- Antidiarrhoeal
- Anti spasmodic
- Antiulcers Drugs.

(C) Drug Acting on Hormonal System:
- Insulin and oral Hypoglycemic agents: Etiology of Diabetes, Biochemistry and Pathogenesis of Diabetes, Production of Insulin.
- Adrenocorticoids: Mechanism of steroid Hormone action, Development of Adrenocorticoid drugs.
- Sex Hormones: Male sex Hormones, Female sex Hormones.
- Thyroid and Antithyroid agents: Biochemistry and Physiology of Thyroid Hormones, Biosynthesis of Thyroid Hormones.

(D) Vitamins


BOOKS RECOMMENDED:


**LIST OF PRACTICALS:**


2. Synthesis and Characterization of Barbital from Urea.


15. Estimation of Na\(^+\), K\(^+\), Ca\(^{++}\) ions using flame photometry.
16. To perform the QSAR Analysis by Free Wilson Approach.
17. To determine the regression coefficients for a series by using Hansch and Free Wilson Approach.
18. To determine the correlation between physiochemical properties and biological activity for a series by using Hansch analysis.
PHARMACOGNOSY – IV (PY 604)

General introduction classification and brief description of different chromatographic techniques with detailed emphasis on application of paper chromatography, column chromatography, TLC, HPLC and HPTLC in the evaluation of herbal drugs.

Historical development of plant tissue culture technique, types of culture, nutritional requirements, surface sterilization of explants, growth and maintenance. Application of PTC in development of phytoconstituents.

An introduction of marine pharmacognosy and novel agents from marine sources like cardiovascular active substances, cytotoxic, antimicrobial, antibiotic, anti-inflammatory, antispasmodic agents, marine toxin etc.

Herbs as health food, cosmeceuticals.

An introduction to cultivation and utilization of aromatic plants with special reference to sandalwood oil, menthe oil, eucalyptus oil, lemon grass oil, clove oil.

Production and analysis of phytoconstituents of pharmaceutical importance like quinine, strychnine, atropine, morphine podophyllotoxin, papain, vincristine, ephedrine and Tannic acid, Spectral analysis of herbal drugs with emphasis on application of UV, IR, NMR, mass.

Natural dyes, Immunomodulators and Adaptogents.

**LIST OF PRACTICAL:**

1. To perform chromatography of amino acids
2. To perform paper chromatography of sugars
3. To perform TLC of alkaloids
4. To perform TLC of extract of rauwolfi, datura
5. To perform TLC of volatile oils i.e. eucalyptus oil, menthe oil
6. To identify the presence of eugenol in clove oil by TLC
7. To determine volatile oil content of eucalyptus leaf
8. To determine volatile oil content of fennel fruits
9. To isolate ammonium glycyrrhizinate from glycyrrhiza
10. To extract aloin from aloe
11. To extract tannic acid from myrobalan
12. To perform column chromatography a natural dye.

**BOOKS RECOMMENDED:**
1. Trease, G.E. and Evans, W.C., Pharmacognosy, Bailliere, Tindall, Eastbourne, U.K.
2. Tayler, V.E., Brady, L.R. and Robers, J.E., Pharmacognosy Lea and Febiger, Philadelphia
3. Kokate, C.K., Purohit, A.P. and Gokhale, S.B., Pharmacognosy Nirali Prakashan, Pune
Pharmacology-III (PY 605)

Pathophysiology of diseases of cardiovascular system and pharmacology of drugs used for their treatment
   a) Cardiac Glycosides
   b) Antiarrythmic drugs
   c) Antianginal drugs
   d) Antihypertensive drugs

Pharmacology of drugs acting on hematopoietic system
   a) Hematinics
   b) Drugs affecting coagulation, bleeding and thrombosis
   c) Plasma expanders
   d) Hypolipidaemic drugs

Pharmacology of drugs acting on urinary system

Pathophysiology of diseases of endocrine system and pharmacology of drugs used for their treatment
   a) Hypothalamic and pituitary hormones
   b) Thyroid hormones and antithyroid drugs
   c) Insulin, oral hypoglycemic agents and glucagons
   d) Corticosteroids
   e) Androgens and drugs for erectile dysfunction
   f) Estrogens, progestins and contraceptives
   g) Oxytocin and drugs acting on uterus
   h) Drugs affecting calcium balance

List of Practicals

1. Determine the strength of given sample (acetyl choline/ histamine) by three point bioassay method using isolated organ preparation (rat ileum/ rat duodenum/ rat colon/ rat fundus/ guinea pig ileum).
2. Determine the strength of given sample (acetyl choline/ histamine) by four point bioassay method using isolated organ preparation (rat ileum/ rat duodenum/ rat colon/ rat fundus/ guinea pig ileum).
3. Record the concentration response curve of oxytocin using rat uterus preparation.
5. Compare the diuretic/saluretic activity of different drugs in rats.
6. Determine the effect of anticoagulants by subaqueous tail bleeding time method in rodents.
7. Study the effect of oral hypoglycemic agents in diabetic rodents.
8. Study the effect of thyroid hormones on the tensile strength of connective tissues in rats.
9. Study the effect of growth hormone on the weight gain in female rats.

BOOKS RECOMMENDED

