B. PHARM. SEMESTER-V
501 T: PHARMACEUTICS- VI (COSMETIC TECHNOLOGY)

Fundamental of cosmetic science. Formulation considerations, preparation, packaging and evaluation of the following cosmetic preparation:

1. Face Preparation: Face powder, Compact powder, Talcum powder, Face packs and Masks.
2. Colored make-up preparations: Lipsticks, Rouge, Mascara and Eye-liner.
6. Hair Preparations: Hair tonics, Hair conditioners, Hair lotions, Hair sprays, Hair dressings, Hair setting lotions and creams, Hair dyes, bleaches, Hair waiving, Hair straightners and Hair strengtheners.
8. Manicure Preparation: Nail polish, Nail lacquers and Nail bleaches.
9. Herbal Cosmetics: Cosmetics containing Aloe, Babul, Brahmi, Chandan, Cucumber, Haldi, Jatamansi, Khus, Mehandi, Neem, Reetha, Shikakai, Tulsi, Arnica, Bhringraj And Volatile Oils.

501 P: PHARMACEUTICS- VI (COSMETIC TECHNOLOGY)

1. Prepare, Pack and Evaluate Compact Powder.
2. Prepare and Evaluate Talcum Powder.
3. Prepare and Evaluate Vanishing Cream.
4. Prepare and Evaluate Cold Cream.
5. Prepare and Evaluate Cleansing Cream.
6. Prepare and Evaluate Emollient Cream.
7. Prepare and Evaluate Bleach Cream.
8. Prepare and Evaluate Sunscreen Preparation.
9. Prepare and Evaluate After shave lotion.
10. Prepare and Evaluate Lather shaving cream.
11. Prepare and Evaluate Lather shaving cream.
12. Prepare and Evaluate Simple shampoo (soap based).
13. Prepare and Evaluate Acid balanced shampoo.
15. Prepare and Evaluate Anti-dandruff shampoo.
16. Prepare and Evaluate Hair conditioner.
17. Prepare and Evaluate Tooth Powder.
18. Prepare and Evaluate Tooth Paste.
19. Prepare and Evaluate Mouth Wash.
20. Prepare, Pack and Evaluate Lipsticks.
22. Prepare and Submit Herbal preparations.

**BOOKS RECOMMENDED**


**502 T: PHARMACEUTICS-VII (PHARMACEUTICAL TECHNOLOGY-I)**

1. Liquid Dosage Forms: Introduction, types of additives used in formulations, vehicles, stabilizers, preservatives, suspending agents, emulsifying agents, solubilizers, colors, flavors and others, manufacturing, packaging and evaluation of clear liquids, suspensions and emulsions.
4. Solid Dosage Forms: Tablets: a. Formulation of different types of tablets, granulation technology on large scale by various techniques, different types of tablet compression, machinery and the equipments involved, evaluation of tablets.
5. Solid Dosage Forms: Capsules: Advantages and disadvantages of capsules dosage form, material for production of hard gelatin capsules, size of capsules, methods of capsule filling and sealing, soft gelatin capsule, capsule shell and capsule content, importance of base adsorption and minim per gram factors in soft gelatin capsules, quality control, stability studies and testing of capsule dosage form.
6. Pharmaceutical aerosols: Definition, propellants, and general formulation, manufacturing and packaging methods and pharmaceutical applications.
7. A brief introduction of blood products, plasma substitutes and surgical products.

**502 P: PHARMACEUTICS-VII (PHARMACEUTICAL TECHNOLOGY-I)**

1. Prepare and Evaluate suspensions.
2. Prepare and Evaluate emulsions.
3. Prepare and Evaluate solutions.
4. Prepare and Evaluate ointment bases.
5. Prepare and Evaluate ointments.
6. Fill and seal ointments (collapsible tubes).
7. Fill liquid dosage forms using bottle filling machine.
8. Seal bottles using bottle sealing machine.
10. Prepare and Evaluate suppositories.
11. Perform demonstration of various surgical products.
12. Prepare and Evaluate tablets by wet granulation method.
13. Prepare and Evaluate tablets by dry granulation method.
15. Prepare and Evaluate different types of tablets.
16. Perform coating of granules/tablets by different methods and its evaluation.
17. Perform evaluation and comparison of marketed tablets with the prepared tablets.
18. Perform filling, sealing and evaluation of capsules.

**BOOKS RECOMMENDED**

7. Pharmacopoeia of India, Ministry of Health and Family Welfare, Govt. of India, New Delhi.
8. Parrott E.L., Pharmaceutical Technology, Burgess, Minneapolis MN.

503 T: PHARMACEUTICAL CHEMISTRY-V (MEDICINAL CHEMISTRY-I)

1. Introduction and basic principles of Medicinal Chemistry: Historical perspectives of Medicinal Chemistry, Drug discovery, Physico-chemical, stereochemical (optical and geometrical) properties and bioisosterism in relation to biological action, receptors and drug action, theories and drug receptor interactive forces, Enzymes and drug action, Drug metabolism, Phase I and Phase II reactions
   Classification, synthesis of selective drugs, Structure activity relationship, pharmacological/biochemical mechanism of action, Therapeutic uses of following category of agents: (special emphasis should be given to specified drugs)
   2. Drugs affecting neurotransmission:
      c. Drug acting on serotonergic neurotransmission: Neurochemistry and stereochemistry of Serotonin, Serotonergic agonists and antagonistic agents.
      d. Local Anesthetic agents: Benzocaine, Procaine hydrochloride, Lignocaine hydrochloride, Bupivacaine hydrochloride, and Dibucaine hydrochloride.
3. Drugs affecting the Immune System:
   b. Antihistamines, anti-allergic and anti-ulcer agents: Neurochemistry and stereochemistry of histamine, Dual acting anti-histaminics, H₂ and H₃ antagonists (Diphenhydramine Hydrochloride, Bromodiphenhydramine Hydrochloride, Chlorcyclizine Hydrochloride, Promethazine Hydrochloride, Phenindamine Tartrate and Chlorpheniramine Maleate).


5. Miscellaneous agents:
   a. Diagnostic and Medicinal dyes (Congo Red, Evans Blue, Erythrosine Sodium, Iodipamide Meglumine, Phenolsulphonphthalein, Indocyanin Green And Fluorescein Sodium).
   b. Pharmaceutical aids.

503 P: PHARMACEUTICAL CHEMISTRY-V (MEDICINAL CHEMISTRY- I)

The practical includes synthesis of selected medicinally important compounds, physico-chemical characterization including melting point, solubility, thin layer chromatography, UV and IR spectrum.

1. Perform column chromatography of the given sample.
2. Synthesis and characterization of Benzocaine.
3. Synthesis and characterization of Salicylic Acid.
5. Synthesis and characterization of 2,3-Diphenyl Quinoxaline.
7. Synthesis and characterization of p-Nitro Acetanilide
BOOKS RECOMMENDED


504T PHARMACOGNOSY III

1. Systematic study of source, cultivation, collection, processing, commercial varieties, chemical constituents, substitutes, adulterants, uses, diagnostic macroscopic and microscopic features and specific chemical tests of following
Alkaloid containing drugs:
   a. Tropane: Belladona, hyoscyamus, datura, coca and withania.
   b. Quinoline and isoquinoline: Cinchona, ipecac and opium.
   c. Indole: Ergot, rauwolfia, catharanthus, nux-vomica, phsysostigma.
   d. Steroidal: Veratrum and kurchi.
   e. Steroidal amine: Ephedra and colchicum.
f. Purines: Coffee, tea and cola.

2. A brief account of plant-based industries and institutions involved in work on medicinal and aromatic plants in India, utilization and production of phytoconstituents such as Quinine, Calcium sennosides, Podophyllotoxin, Diosgenin, Solasodine and Tropane Alkaloids.

3. Utilization of aromatic plants and derived products with special reference to Sandalwood oil, Mentha oil, Lemon grass oil, Vetiver oil, Gentium oil and Eucalyptus oil.

4. Marine pharmacognosy novel medicinal agents from marine sources.

5. Introduction, classification and study of different chromatographic methods and their applications in evaluation of herbal drugs.

6. Holistic concept of drug administration in traditional systems of medicine, introductions to ayurvedic preparations like arishtas, asavs, gutikas, tailas, churans, lehyas and bhasmas.

**504P: PHARMACOGNOSY III**

1. Study of microscopic characters of Withania root.

2. Study of microscopic characters of Datura leaf.

3. Study of microscopic characters of Vinca rosea.

4. Study of microscopic characters of Nux vomica.

5. Study of microscopic characters of Kurchi.

6. Perform powder characteristics Rauwolfia and vinca rosea.

7. Perform powder characteristics Nux vomica and Kurchi.

8. Isolate volatile oil contents from leaves of Mentha.

9. Isolate volatile oil contents from leaves of Lemon grass.

10. Isolate volatile oil contents from leaves of Eucalyptus.

11. Perform paper chromatography of given sample.


**BOOKS RECOMMENDED**

4. Indian Pharmacopoeia, Ministry of Health and Family Welfare, Govt. of India, New Delhi.

505T: PHARMACOLOGY-I

1. General Pharmacology
   a. Introduction to pharmacology, sources of drugs, dosage forms and routes of administration, mechanism of action, combined effects of drugs, factors modifying drug action, tolerance and dependence, pharmacogenetics.
   b. Absorption, distribution, metabolism and excretion of drugs, principle of basic and clinical pharmacokinetics adverse drug reactions and treatment of poisoning, ADME drug interactions, receptors, bioassay of drugs and biological standardization, discovery and development of new drugs. Introduction to clinical trials, bioavailability and bioequivalence studies.

2. Pharmacology of peripheral nervous system
   a. Neurohumoral transmission (autonomic and somatic)
   b. Parasympathomimetic, parasympatholytic and sympathomimetics.
   c. Adrenergic receptors and neuron blocking agents, ganglionic stimulants and blocking agents.
   d. Neuromuscular blocking agents.
   e. Local anaesthetic agents.

3. Pharmacology of drugs acting on gastrointestinal tract
   a. Antacids, anti-secretory and anti-ulcer drugs (pathophysiology of ulcer).
   b. Laxatives and anti-diarrhoeal drugs.
c. Appetite stimulants and suppressants.
d. Emetics and anti-emetics.
e. Carminatives, demulcents, protectives, adsorbents, astringents, digestants, enzymes and mucolytics.

4. Autacoids:
   a. Histamine, bradykinin, 5-HT and their antagonists.
   b. Prostaglandins, leukotrienes and platelet activating factors.
   c. Pentagastrin, cholecystokinin, angiotensin, bradykinin and substance P

5. Analgesic, antipyretic, anti-inflammatory (vascular and cellular events of acute inflammation, chemical mediators of inflammation, pathogenesis of chronic inflammation), anti-gout and anti rheumatic drugs (pathophysiology of gout and rheumatoid arthritis)

6. Pharmacology of drugs used for respiratory system:
   Anti-asthmatic drugs (pathophysiology of asthma) including bronchodilators, antitussives, expectorants and respiratory stimulants.

505P: PHARMACOLOGY-I

1. Introduction to experimental pharmacology and various regulatory authorities.
2. Study of common laboratory animals and anesthetics used in animal studies.
3. Study of various routes of drug administration in experimental animals.
4. Preparation and use of molar and w/v solutions in experimental pharmacology.
5. Study of commonly used instruments in experimental pharmacology.
6. Perform the bioassay for acetylcholine/histamine using isolated organ preparations (rat ileum/rat duodenum/rat colon/rat fundus/guinea pig ileum/guinea pig tracheal chain preparation/goat ileum)
   a) Matching bioassay or Bracketing bioassay
   b) Interpolation bioassay or graphical bioassay

7. Study of the effect of autonomic drugs on rabbit’s eye.
8. Record the concentration response curve of acetylcholine, physostigmine, d-tubocurarine, 5-HT, histamine and noradrenaline using isolated preparations.
9. Study of the effect of local anesthetics on rabbit’s eye.
10. Study of the peripheral analgesic activity of given drug using writhing test on mice.
12. Study of the analgesic effect of given drug on mice using
   a) Radiant heat analgesiometer.
   b) Eddy’s hot plate.

BOOKS RECOMMENDED

506 P: COMMUNICATION SKILLS & PERSONALITY DEVELOPMENT-V
1. Oral business communication: Characteristics of effective oral communication, oral
communication skills, components of oral effective communication, barriers to effective oral communication, difference between oral and written communication, tools for oral communication.

2. Non-verbal business communication: Introduction of non-verbal business communication, characteristics of non-verbal business communication, nature and significance of non-verbal business communication, relation between verbal and non-verbal communication. (Seminars on related topics)

BOOKS RECOMMENDED

2. Rutherford, A.J. Basic Communication Skills for Technology, Pearson Education Asia, Hong Kong.