Pharmacy Academy
IFTM UNIVERSITY, MORADABAD.
www.iftmuniversity.ac.in

Study & Evaluation Scheme of
Diploma in Pharmacy

Programme	:	***Diploma in Pharmacy***
Course Level	:	***Diploma***
Duration	:	***Two academic Year (Full Time)***
Medium of instruction	:	***Hindi, English***
Minimum Required Attendance	:	***75%***

Programme Outcomes (POs):

On completion of the D. Pharm. program, a student will be able to:

- Have sound knowledge to assess various disease and pathological conditions.
- Read, process and interpret the prescription.
- Prepare, pack, label and dispense the prescribed medications in addition to non-sterile compounding.
- Maintain of inventory record, analyze, organize and manage documents.
- Solve problems as a part of healthcare system.
- Demonstrate use of medical aids to patients.
- Develop a positive aptitude for skill development and lifelong learning.
- Provide empathy to chronic/emergency/economically back ward patients and their family.
- Apply the ethics and code of conduct to patient's, healthcare providers, other pharmacy co-workers and as well as to the society.
- Create awareness in society about the effective and safe use of medicines along with their storage conditions.

YEAR-I

Sl. No.	Subject Code	Subject Name	Periods			Evaluation Scheme					Subjects Total	Credits
			L	T	P	Mid Sessional Examn.				Annual Examn.		
						CT	As	At	Total			
THEORY												
1.	DPH-101	Pharmaceutics-I	3	--	0	15	--	05	20	80	100	3
2.	DPH-102	Pharmaceutical Chemistry-I	3	--	0	15	--	05	20	80	100	3
3.	DPH-103	Pharmacognosy	3	--	0	15	--	05	20	80	100	3
4.	DPH-104	Biochemistry & Clinical Pathology	2	--	0	15	--	05	20	80	100	2
5.	DPH-105	Human Anatomy & Physiology	3	--	0	15	--	05	20	80	100	3
6.	DPH-106	Health Education & Community Pharmacy	2	--	0	15	--	05	20	80	100	2
PRACTICAL/PROJECT												
7.	DPH=101P	Pharmaceutics-I	0	0	4	--	10	10	20	80	100	2
8.	DPH-102P	Pharmaceutical Chemistry-I	0	0	3	--	10	10	20	80	100	2
9.	DPH-103P	Pharmacognosy	0	0	3	--	10	10	20	80	100	2
10.	DPH-104P	Biochemistry & Clinical Pathology	0	0	3	--	10	10	20	80	100	2
11.	DPH-105P	Human Anatomy & Physiology	0	0	3	--	10	10	20	80	100	2
		Total	**16**	**--**	**16**	--	--	--	--	--	**1100**	**26**

L: Lecture; **T:** Tutorial; **P:** Practical; **CT:** Class Test; **As:** Assignment; **At:** Attendance.

DIPLOMA IN PHARMACY (Ist Year)

DPH-101 **PHARMACEUTICS-I**

Scope: This course is designed to impart a fundamental knowledge on the art and science of various dosage forms, immunological products and unit operation's used in pharmaceutical industry.

Objectives: Upon completion of the course student shall be able:

1. To understand the basics of different dosage forms
2. To know about metrology used in pharmaceutical industries (system of weights, measures and their calculations).
3. To know desirable features of a container used specially for pharmaceutical products.
4. To understand the material handling techniques.
5. To perform various processes involved in pharmaceutical manufacturing process.
6. To carry out various test to prevent the formulation from external effect.
7. To understand the processing of tablets and capsules.
8. To understand the basics of immunological products.

Course Content:

1. Introduction of different dosage forms. Their classification with examples-their relative applications. Familiarisation with new drug delivery systems.
2. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.
3. Metrology. Systems of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustments of products. Use of alligation method in calculations, Isotonic solutions.
4. Packing of Pharmaceuticals. Desirable features of a container. types of containers. Study of glass and plastics as materials for containers and rubber as material for closures-their merits and demerits. Introduction to aerosol packaging.
5. Size reduction Objectives, and factors affecting size reduction, methods of size reduction. Study of Hammer mill, Ball mill, Fluid Enegy Mill and Disintegrator.
6. Size separation. Size separation by sifting. Official Standard for powders. Sedimentation methods of size separation. Construction and working of cyclone separator.
7. Mixing and Homogenisation. Liquid mixing and powder mixing, Mixing of semisolids, Study of Silverson Mixer. Homogeniser, Planetary Mixer; Agitated powder mixer; Triple Roller Mill; Propeller Mixer, Colloid Mill and Hand Homogeniser. Double cone mixer.
8. Clarification and Filtration-Theory of filtration, Filter media; Filter aids and selection of filters. Study of the following filtration equipments. Filter Press, Sintered Filters, Filter Candles, Metafilter

9. Extraction and Galenicals

(a) Study of percolation and maceration and their modification, continuous hot extraction. Applications in the preparation of tinctures and extracts.

(b) Introduction to Ayurvedic dosage forms.

10. Heat processes Evaporation. Definition Factors affecting evaporation-Study of evaporating still and Evaporating Pan.
11. Distillation. Simple distillation and Fractional distillation; Steam distillation and vacuum distillation. Study of vacuum still, preparation of Purified Water I.P. and water for injection I.P. Construction and working of the still used for the same.
12. Introduction to drying processes. Study of Tray Dryers: Fluidized Bed Dryer, Vacuum Dryer and Freeze Dryer.
13. Sterilization. Concept of sterilization and its differences from disinfection-Thermal resistance of micro-organisms. Detailed study of the following sterilization process.
    i. Sterilization with moist heat,
    ii. Dry heat sterilization,
    iii. Sterilization by radiation,
    iv. Sterilization by filtration and
    v. Gaseous sterilization.

    Aseptic techniques. Application of sterilization processes in hospitals particularly with reference to surgical dressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.
14. Processing of Tablets-Definition; Different types of compressed tablets and their properties. Processes involved in the production of tablets; Tablets excipients; Defects in tablets. Evaluation of Tablets; Physical Standards including Disintegration and Dissolution. Tablet coating. sugar coating; film coating, enteric coating and microencapsulation (Tablet coating may be dealt in an elementary manner.)
15. Processing of Capsules. Hard and soft gelatin capsules; different sizes capsules; filling of capsules; handling and storage of capsules, Special applications of capsules.
16. Study of immunological products like sera vaccines, toxoids & their preparations.

DPH-101P PHARMACEUTICS-I (Practical)

1. Aromatic waters
2. Solutions
3. Spirits
4. Tinctures
5. Extracts

6. Creams
7. Cosmetic preparations
8. Capsules
9. Tablets
10. Preparations involving sterilization
11. Ophthalmic preparations
12. Preparations involving aseptic techniques

Books Recommended : (Latest editions)

1. Remington's PharmaceuticalSciences.
2. The Extra PharmacopoeiaMartindale.
3. Theory and Practice ofIndustrial Pharmacy by Lachmann, Lea& Febiger Publisher, The University of Michigan.
4. Pharmaceutics- I by R. M. Mehta, Vallabh Prakashan, Delhi
5. Pharmaceutics -I by V. N. Raje , CBS Publishers & Distributors, New Delhi.
6. Pharmaceutics- I by R. M. Mehta, Vallabh Prakashan, Delhi

DPH-102 **PHARMACEUTICAL CHEMISTRY –I**

Scope: This subject deals with method of preparations, important physical and chemical properties, storage conditions, chemical incompatibility and pharmaceutical uses of inorganic drugs and pharmaceuticals.

Objectives: Upon completion of course student shall be able to

1. Write the name, structure, properties and the type of inorganic compounds.
2. understands the major intra and extracellular electrolytes and physiological acid-base balance.
3. Know the sources of impurities and methods to determine the impurities in inorganic drugs.
4. Know the identification tests for cations and anions.
5. Understand the medicinal and pharmaceutical importance of inorganic compounds and radio-pharmaceuticals.

Course Content:

1. General discussion on the following inorganic compounds including important physical and chemical properties, medicinal and Pharmaceutical uses, storage conditions and chemical incompatibility.

(A) Acids, bases and buffers Boric acid*, Hydrochloric acid, strong ammonium hydroxide, Calcium hydroxide, Sodium hydroxide and official buffers.

(B) Antioxidants. Hypophosphorous acid, Sulphur dioxide, Sodium bisulphite, Sodium metabisulphite, Sodium thiosulphate, Nitrogen and Sodium Nitrite.

(C) Gastrointestinal agents--

(i) Acidifying agents Dilute hydrochloric acid.

(ii) Antacids-Sodium bicarbonate, Aluminium hydroxide gel, Aluminium Phosphate, Calcium carbonate, Magnesium carbonate, Magnesium trisilicate, Magnesium oxide, Combinations of antacid preparations.

(iii) Protectives and Adsorbents-Bismuth subcarbonate and Kaolin.

(iv) Saline Cathartics-Sodium potassium tartrate and Magnesium sulphate.

(D) Topical Agents-

(i) Protectives-Talc, Zinc Oxide, Calamine, Zinc stearate, Titanium dioxide, Silicone polymers.

(ii) Antimicrobials and Astringents. Hydrogen peroxide*, Potassium permanganate, Chlorinated lime, Iodine, Solutions of Iodine, Povidone-iodine, Boric acid, Borax. Silver nitrate, Mild silver protein, Mercury, Yellow mercuric oxide, Ammoniated mercury.

(iii) Sulphur and its compounds. Sublimed sulphur precipitated sulphur, selenium sulphide.

(iv) Astringents:-Alum and Zinc Sulphate.

(E) Dental Products. Sodium Fluride, Stannous Flouride, Calcium carbonate, Sodium metaphosphate, Dicalcium phosphate, Strontium chloride, Zinc chloride.

(F) Inhalants. Oxygen, Carbon dioxide, Nitrous oxide.

(G) Respiratory stimulants. Ammonium Carbonate.

(H) Expectorants and Emetics. Ammonium chloride*, Potassium iodide, Antimony potassium tartrate.

(I) Antidotes-Sodium nitrate.

2. Major Intra and Extracellular electrolytes-

(A) Electrolytes used for replacement therapy-Sodium chloride and its preparations, Potassium chloride and its preparations.

(B) Physiological acid-base balance and electrolytes used-Sodium acetate, Potassium acetate, Sodium bicarbonate injection, Sodium citrate, Potassium citrate, Sodium lactate injection, Ammonium chloride and its injection.

(C) Combination of oral electrolyte powders and solutions.

3. Inorganic Official compounds of Iron, Iodine, and, Calcium Ferrous Sulfate and Calcium gluconate.

4. Radio pharmaceuticals and Contrast media-Radio activity-Alpha, Beta and Gamma Radiations, Biological effects of radiations, Measurement of radio activity, G. M. Counter Radio isotopes their uses, storage and precautions with special reference to the official preparations.

Radio opaque Contrast media. Barium sulfate.

5. Quality control of Drugs and Pharmaceuticals-Importance of quality control, significant errors, methods used for quality control, sources of impurities in Pharmaceuticals, Limit tests for Arsenic, chloride, sulphate, Iron and Heavy metals.

6. Identification tests for cations and anions as per Indian Pharmacopoeia.

DPH-102P PHARMACEUTICAL CHEMISTRY –I (Practical)

1. Identification tests for inorganic compounds particularly drugs and pharmaceuticals.

2. Limit test for chloride, sulfate, Arsenic, Iron and Heavy metals.

3. Assay of inorganic Pharmaceuticals involving each of the following methods of compounds marked with (*) under theory.

a. Acid-Base titrations (at least 3)

b. Redox titrations (One each of Permanganometry and iodimetry)

c. Precipitation titrations (at least 2)

d. Complexometric titrations (Calcium and Magnesium)

Book recommended (Latest editions)

1. Indian Pharmacopoeia.

2. Text Book of Quantitative Inorganic analysis by A.I. Vogel.

3. Inorganic Pharmaceutical Chemistry by M.L Schroff.

4. Textbook of Pharmaceutical Inorganic Chemistry by Mohammed Ali, Oxford and IBH Publishers, Delhi.

5. A Text Book of Pharmaceutical Chemistry-I by Dr. A. V. Kasture, Dr. S. G. Wadokar, Nirali Prakashan, Pune.

DPH-103 **PHARMACOGNOSY**

Scope: Study of all kinds of crude drugs including their identification, classification, adulteration, uses and chemical constituents for medicinal and therapeutic usages.

Objectives: Upon completion of the subject student shall be able to:

1. Understand synonyms, taxonomy, morphological classification of crude drugs.
2. To study various methods of evaluation of adulteration in crude drugs.
3. Cultivation and collection of crude drugs.
4. Various natural pharmaceutical aids and their usages.
5. Chemical constituents identification by chemical tests.
6. Therapeutic usages of crude drugs.

Course Content:

1. Definition, history and scope of Pharmacognosy including indigenous system of medicine.
2. Various systems of classification of drugs of natural origin.
3. Adulteration and drug evaluation; significance of Pharmacopoeial standards.
4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
5. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.

(a) Laxatives: Aloes, Rhuburb, Castor oil, Ispaghula, Senna.

(b) Cardiotonics-Digitalis, Arjuna.

(c) Carminatives & G.I. regulators-Umbelliferous fruits, Coriander, Fennel, Ajowan, Cardamom Ginger, Black pepper, Asafoetida, Nutmeg, Cinnamon, Clove.

(d) Astringents Catechu.

(e) Drugs acting on nervous system-Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra, Opium, Cannabis, Nux vomica.

(f) Antihypertensives-Rauwolfia.

(g) Antitussives-Vasaka, Tolu balsam, Tulsi.

(h) Antirheumatics-Guggul, Colchicum.

(i) Antitumour-Vinca.

(j) Antileprotics-Chaulmoogra Oil.

(k) Antidiabetics -Pterocarpus, Gymnema, Sylvestro.

(l) Diuretics. Gokhru, Punarrnava.

(m) Antidysentrics-Ipecacuanha

(n) Antiseptics and disinfectants Benzoin, Myrrh. Nim, curcuma.

(o) Antimalarials. Cinchona.

(p) Oxytocics-Ergot.

(q) Vitamines-Shark liver Oil and Amla.

(r) Enzymes-Papaya, Diastase, Yeast.

(s) Perfumes and flavouring agents-Peppermint Oil, Lemon Oil, Orange Oil, Lemon grass Oil, Sandalwood.

(t) Pharmaceutical aids-Honey, Arachis Oil, Starch, Kaolin, Pectin, Olive oil, Lanolin, Beeswax, Acacia, Tragacanth, Sodium alginate, Agar, Guar gum, Gelatin.

(u) Miscellaneous-Liquorice, Garlic, Picrorhiza, Dioscorea, Linseed, Shatavari, Shankhapusphi, Pyrethrum, Tobacco.

6. Collection and preparation of crude drug for the market as exemplified by Ergot, opium, Rauwolfia, Digitalis, Senna.

7. Study of source, preparation and identification of fibres used in sutures and surgical dressing's cotton, silk, wool and regenerated fibre.

8. Gross anatomical studies of Senna, Datura, Cinnamon, Cinchona, Fennel, Clove, Ginger, Nux vomica & Ipecacuanha.

DPH-103P PHARMACOGNOSY (Practical)

1. Identification of drug by morphological characters.

2. Physical and chemical tests for evaluation of drugs wherever applicable.

3. Gross anatomical studies (t.s) of the following drugs: Senna, Datura, Cinnamon, Cinchona, Coriander, Fennel, Clove, Ginger, Nuxvomica, Ipecacuanha.

4. Identification of fibres and surgical dressings.

Book recommended (Latest editions)

1. A Text Book of Pharmacognosy, First year Diploma in Pharmacognosy by SB Gokhale, C K Kokate and A P Purohit Publisher Nirali Prakashan, Pune

2. Practical Pharmacognosy by Dr. K R khandelwal, Publisher , Nirali Prakshan,Pune

3. Practical Pharmacognosy by CK Kokate.

DPH-104 BIOCHEMISTRY AND CLINICAL PATHOLOGY

Scope: The course aims to provide an advanced understanding of the core principles and topics of biochemistry and their experimental basis, and to enable students to acquire a specialized knowledge and understanding metabolism of various nutrients in physiological and pathological conditions.

Objectives: At the end of the course, students shall able to know following aspects of subject:

1. Understand the role of protein, carbohydrates and enzymes also their metabolic effects, therapeutic effects, physiological effects and therapeutic applications.
2. Understand the metabolism of various nutrients- vitamins and lipids in biological conditions.
3. Understand the pathological aspects of blood & its component and urine & their role in various diseases.

Course Content:

1. Introduction to biochemistry.
2. Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.
3. Brief chemistry and role of Carbohydrates, Classification, qualitative tests, Diseases related to carbohydrate metabolism.
4. Brief chemistry and role of Lipids, Classification, qualitative tests. Diseases related to lipids metabolism.
5. Brief chemistry and role of Vitamins and Coenzymes.
6. Role of minerals and water in life processes.
7. Enzymes: Brief concept of enzymic action. Factors affecting it. Therapeutic and pharmaceutical importance.
8. Brief concept of normal and abnormal metabolism of proteins, carbohydrates and lipids.
9. Introduction to pathology of blood and urine.

(a) Lymphocytes and Platelets, their role in health and disease.
(b) Erythrocytes Abnormal cells and their significance.
(c) Abnormal constituents of urine and their significance in diseases.

DPH-104P BIOCHEMISTRY AND CLINICAL PATHOLOGY (Practical)

1. Detection and identification of Proteins, Amino acids, Carbohydrates and lipids.

2. Analysis of normal and abnormal constituents of Blood and Urine (Glucose, Urea, Creatine, creatinine, cholesterol, alkaline phosphatase, acid phosphatase, Bilirubin, SGPT, SGOT, Calcium, Diastase, Lipase).

3. Examination of sputum and faeces (microscopic and staining).

4. Practice in injecting drugs by intramuscular, subcutaneous and intravenous routes. Withdrawal of blood samples.

Book recommended (Latest editions)

1. Biochemistry by U. Satyanarayana, U. Chakrapani, Books and Allied Pvt Ltd. Kolkata, India.
2. Biochemistry and Clinical Pathology by K. K. Pillai, J. S. Qadry, CBS Publishers & Distributors, New Delhi, India.
3. Text Book of Biochemistry and Clinical Pathology by M. R. Chaudhari, Y. A. Kulkarni, S. B. Gokhale, Nirali Prakashan, Pune.
4. Biochemistry by Dr. Mrs. Padmaja, H. Agarkar, Dr.YogeshKulkarni, Dr. Rammohan Rao, Nirali Prakashan, Pune.

DPH-105 **HUMAN ANATOMY AND PHYSIOLOGY**

Scope: This subject is designed to convey the fundamental information of the various systems of the human body in anatomy and physiology.

Objectives: Upon end of this course the student should be able to

1. Understand the scope of anatomy and physiology.
2. Describe the structure and functions of cell, tissues, organs, skeleton and blood in human body.
3. Explain the structure and functions of various systems of the human body.

Course Content:

1. Scope of Anatomy and Physiology.

Definition of various terms used in Anatomy

2. Structure of cell, function of its components with special reference to mitochondria and microsomes.

3. Elementary tissues of the body. i.e epithelial tissue, muscular tissue, connective tissue and nervous tissue.

4. Structure and function of skeleton. Classification of joints and their function, Joint disorder.

5. Composition of blood, functions of blood elements. Blood group and coagulation of blood. Brief information regarding disorders of blood.

6. Name and functions of lymph glands.

7. Structure and functions of various parts of the heart. Arterial and venous systems with special reference to the names and positions of main arteries and veins. Blood pressure and its recording. Brief information about cardiovascular disorders.

8. Various parts of respiratory system and their functions. Physiology of respiration.

9. Various parts of urinary system and their functions, structure and functions of kidney. Physiology of Urine formation. Pathophysiology of renal diseases and oedema.

10. Structure of skeletal muscle. Physiology of muscle contraction, Names, position, attachments and functions of various skeletal muscles. Physiology of neuromuscular junction.

11. Various parts of central nervous system, brain and its parts, functions and reflex action. Anatomy and Physiology of autonomic nervous system.

12. Elementary knowledge of structure and functions of the organs of taste, smell, ear, eye and skin. Physiology of pain.

13. Digestive system; names of the various parts of digestive system and their functions. Structure and functions of liver, physiology of digestion and absorption.

14. Endocrine glands and Hormones. Locations of the glands, their hormones and functions. Pituitary, thyroid, Adrenal and Pancreas.

15. Reproductive system -Physiology and Anatomy of Reproductive system.

DPH-105P HUMAN ANATOMY AND PHYSIOLOGY (Practical)

1. Study of the human skeleton.

2. Study with the help of charts and models of the following systems and organs:

(a) Digestive system.

(b) Respiratory system.

(c) Cardiovascular system.

(d) Urinary system.

(e) Reproductive system.

(f) Nervous system.

(g) Eye.

(h) Ear.

3. Microscopic examination of epithelial tissue, cardiac muscle, smooth muscle, skeletal muscle. Connective tissue and nervous tissues.

4. Examination of blood films for TLC, DLC and malarial parasite.

5. Determination of clotting time of blood, erythrocyte sedimentation rate and Hemoglobin value.

6. Recording of body temperature, pulse, heart rate, blood pressure and ECG.

Book recommended (Latest editions)

1. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
2. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.
3. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA, U.S.A.
4. Textbook of Practical Physiology by C.L. Ghai, Jaypee brothers medical publishers, New Delhi.

DPH-106 HEALTH EDUCATION AND COMMUNITY PHARMACY

Scope: This course is designed to impart fundamental knowledge related to favorably changing attitudes and influencing behavior with respect to health practices and also imparting information about health in such a way that the recipient is motivated to use that information for the protection or advancement of his own, his family's or his community's health.

Objectives: Upon completion of course student shall be able:

1. To know about the different diseases, their etiology and how to prevent them.
2. To understand about the changing or forming attitudes, beliefs, values or opinions about health.
3. To understand the changing lifestyles affect on health and in preventing disease.
4. To become responsible and himself must take to receive the full benefits of prevention at all levels.
5. To motivate people and alerting them to the physician's services and to all other community health resources.
6. To know about services of community pharmacy, a place under the direct supervision of a pharmacist where the practice of pharmacy occurs.

Course Content:

1. Concept of health. Definition of physical health, mental health, social health, spiritual health determinants of health, indicators of health, concept of disease, natural history of diseases, the disease agents, concept of prevention of diseases.

2. Nutrition and health. Classification of foods requirements, disease induced due to deficiency of proteins, Vitamins and minerals-treatment and prevention.

3. Demography and family planning. Demography cycle, fertility, family planning, contraceptive methods, behavioural methods, natural family planning method, chemical method, mechanical methods, hormonal contraceptives, population problem of India.

4. First aid. Emergency treatment in shock, snake-bite, burns poisoning, heart disease, fractures and resuscitation methods. Elements of minor surgery and dressings.

5. Environment and health-Sources of water supply, water pollution, purification of water, health and air, noise light-solid waste disposal and control-medical entomology, arthropod borne diseases and their control, rodents, animals and diseases.

6. Fundamental principles of microbiology classification of microbes, isolation, staining techniques of organisms of common diseases.

7. Communicable diseases. Causative agents, modes of transmission and prevention.

(a) Respiratory infections. Chicken pox, measles. Influenza, diphtheria, whooping cough and tuberculosis.

(b) Intestinal infections: Poliomyelitis. Hepatitis. Cholera. Typhoid, Food poisoning, Hookworm infection.

(c) Arthropod borne infections-plague, Malaria, Filariasis.

(d) Surface infections-Rabies, Trachoma, Tetanus, Leprosy.

(e) Sexually transmitted diseases ---Syphilis. Gonorrhoea. AIDS.

8. Non-communicable diseases-Causative agents, prevention, care and control; Cancer, Diabetes, Blindness, Cardiovascular diseases.

9. Epidemiology. Its scope, methods, uses, dynamics of disease transmission, immunity and immunization: Immunological products and their dose schedule. Principles of disease control and prevention, hospital acquired infection, prevention and control. Disinfection, types of disinfection, disinfection procedures, for faeces, urine, sputum, room linen, dead-bodies, instruments.

Book recommended (Latest editions)

1. Handbook of Health Education and community Pharmacy by A. K. Gupta. CBS Publishers and Distributers Private Limited, New Delhi
2. Health Education and Community Pharmacy by P.C. Dandiya, Z.Y. K. Zafer and A. Zafer. Vallabh Prakashan, New Delhi
3. Health Education and Community Pharmacy by N.S. Parmar. CBS Publishers and Distributers Private Limited, New Delhi
4. Health Education and community Pharmacy by N. Murughesh, New Delhi
5. Basics of Health Education and community Pharmacy by R.K. Goyal, P.A. Bhatt and P. Kumar. B.S. Shah Prakashan, Ahmedabad.

YEAR-II

Sl.No.	Subject Code	Subject Name	Periods			Evaluation Scheme					Subjects Total	Credits
			L	T	P	Mid Sessional Examn.				Annual Examn.		
						CT	As	At	Total			
THEORY												
1.	DPH=201	Pharmaceutics-II	3	--	0	15	--	05	20	80	100	3
2.	DPH-202	Pharmaceutical Chemistry-II	3	--	0	15	--	05	20	80	100	3
3.	DPH-203	Pharmacology & Toxicology	3	--	0	15	--	05	20	80	100	3
4.	DPH-204	Pharmaceutical Jurisprudence	2	--	0	15	--	05	20	80	100	2
5.	DPH-205	Drug Store & Business Management	3	--	0	15	--	05	20	80	100	3
6.	DPH-206	Hospital & Clinical Pharmacy	3	--	0	15	--	05	20	80	100	3
PRACTICAL/PROJECT												
7.	DPH=201P	Pharmaceutics-II	0	0	4	--	10	10	20	80	100	2
8.	DPH-202P	Pharmaceutical Chemistry-II	0	0	3	--	10	10	20	80	100	2
9.	DPH-203P	Pharmacology & Toxicology	0	0	3	--	10	10	20	80	100	2
10.	DPH-206P	Hospital & Clinical Pharmacy	0	0	3	--	10	10	20	80	100	2
		Total	**17**	**--**	**13**	--	--	--	--	--	**1000**	**25**

L: Lecture; **T:** Tutorial; **P:** Practical; **CT:** Class Test; **As:** Assignment; **At:** Attendance.

DIPLOMA IN PHARMACY (IInd Year)

DPH-201 PHARMACEUTICS II

Scope: This course is designed to impart a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms and their dispensing with respect to the prescription.

Objectives: Upon completion of this course the student should be able to:

1. Know the detailed knowledge about the prescription; understand the professional way of handling the prescription and the calculation of dosage.
2. Understand the basics of different dosage forms, posology, pharmaceutical incompatibilities found in prescription.
3. Know the detailed knowledge about the method of preparations, additives/excipients used in the preparations of various conventional dosage forms.

Course Content:

1. Dispensing Pharmacy:

(i) Prescriptions-Reading and understanding of prescription; Latin terms commonly used (Detailed study is not necessary), Modern methods of prescribing, adoption of metric system. Calculations involved in dispensing.

(ii) Incompatibilities in Prescriptions-Study of various types of incompatibilities-physical, chemical and therapeutic.

(iii) Posology. Dose and Dosage of drugs, Factors influencing dose, Calculations of doses on the basis of age, sex and surface area. Veterinary doses.

2. Dispensed Medications:

(Note: A detailed study of the following dispensed medication is necessary. Methods of preparation with theoretical and practical aspects, use of appropriate containers and closures. Special labelling requirements and storage conditions should be high-lighted).

(i) Powders-Types of powders-Advantages and disadvantages of powders, Granules, Cachets and Tablet triturates. Preparation of different types of powders encountered in prescriptions. Weighing methods, possible errors in weighing, minimum weighable amounts and weighing of material below the minimum weighable amount, geometric dilution and proper usage and care of dispensing balance.

(ii) Liquid Oral Dosage Forms:

(a). Monophasic. Theoretical aspects including commonly used vehicles, essential adjuvant like stabilizers, colourants and flavours, with examples.

Review of the following monophasic liquids with details of formulation and practical methods.

Liquids for internal administration	Liquids for external administration or used on mucus membranes.
Mixtures and concentrates	Gargles
Syrups	Mouth washes Throat-paints Douches
Elixirs	Ear Drops Nasal drops & Sprays Liniments Lotions.

(b) Biphasic Liquid Dosage Forms:

(i) Suspension (elementary study) Suspensions containing diffusible solids and liquids and their preparations. Study of the adjuvants used like thickening agents, wetting agents, their necessity and quantity to be incorporated. Suspensions of precipitate forming liquids like, tinctures, their preparations and stability. Suspensions produced by chemical reaction. An introduction to flocculated, non-flocculated suspension system.

(ii) Emulsions-Types of emulsions, identification of emulsion system, formulation of emulsions, selection of emulsifying agents. Instabilities in emulsions. Preservation of emulsions.

(iii) Semi-Solid Dosage Forms:

(a) Ointments. Types of ointments, classification and selection of dermatological vehicles. Preparation and stability of ointments by the following processes:

(i) Trituration (ii) Fusion (iii) Chemical reaction (iv) Emulsification.

(b) Pastes--- Difference between ointments and pastes, bases of pastes. Preparation of pastes and their preservation.

(c) Jellies-An introduction to the different types of jellies and their preparation.

(d) An elementary study of poultice.

(e) Suppositories and pessaries-Their relative merits and demerits, types of suppositories,

suppository bases, classification, properties, Preparation and packing of suppositories. Use of suppositories for drug absorption.

(iv) Dental and Cosmetic Preparations:

Introduction to Dentrifices, Facial cosmetics, Deodorants, Antiperspirants, Shampoos, Hair dressing and Hair removers.

(v) Sterile Dosage Forms:

(a) Parenteral dosage forms. Definitions, General requirements for parenteral dosage forms. Types of parenteral formulations, vehicles, adjuvants, processing, personnel, facilities and Quality control. Preparation of Intravenous fluids and admixtures-Total parenteral nutrition, Dialysis fluids.

(b) Sterility testing, Particulate matter monitoring-Faulty seal packaging.

(c) Ophthalmic Products-Study of essential characteristics of different ophthalmic preparations. Formulation additives, special precautions in handling and storage of ophthalmic products.

DPH-201P PHARMACEUTICS II (Practical)

Dispensing of at least 100 products covering a wide range of preparations such as mixtures, emulsions, lotions, liniments, E.N.T, preparations, ointments, suppositories, powders, incompatible prescriptions etc.

Books recommended :(Latest editions)

1. Indian Pharmacopoeia.
2. British Pharmacopoeia.
3. National Formularies (N.F.I, B.N.F)
4. Remington's Pharmaceutical Sciences.
5. Martindale Extra Pharmacopoeia.
6. Pharmaceutics- II by R. M. Mehta, Vallabh Prakashan, Delhi.
7. Pharmaceutics- II by Gaurav Agarwal CBS Publishers & Distributors, New Delhi.
8. Theory and Practice of Industrial Pharmacy by Lachmann, Lea& Febiger Publisher, The University of Michigan.

DPH-202 **PHARMACEUTICAL CHEMISTY II**

Scope: This subject is designed to convey a fundamental knowledge on the introduction to the nomenclature of organic chemical systems, important structures, chemistry, physical/chemical properties and therapeutic values of pharmaceutical organic compounds.

Objectives: After completion of the syllabus students are able to-

1. Know the nomenclature of organic chemical systems with particular reference to heterocyclic system.
2. Understand the chemical structures, chemistry and medicinal uses of pharmaceutical organic compounds.
3. Know the important physical and chemical properties of pharmaceutical organic compounds.
4. Know the stability, storage conditions, pharmaceutical formulations and brand names of pharmaceutical organic compounds.

Course Content:

1. Introduction to the nomenclature of organic chemical systems with particular reference to heterocyclic system containing up to 3 rings.
2. The Chemistry of following Pharmaceutical organic compounds, covering their nomenclature, chemical structure, uses and the important Physical and Chemical properties (Chemical structure of only those compounds marked with asterisk (*).

The stability and storage conditions and the different type of Pharmaceutical formulations of these drugs and their popular brand names.

Antiseptics and Disinfectants-Proflavine, * Benzalkoniumchloride, Cetrimide, Chlorocresol*, Chloroxylene, Formaldehyde solution, Hexachlorophene, Liquified phenol, Nitrofurantoin.

Sulfonamides-Sulfadiazine, Sulfaguanidine*, Phthalysulfathiazole, Succinylsulfathiazole, Sulfadimethoxine, Sulfamethoxypridazine, Sulfamethoxazole, co-trimoxazole, Sulfacetamide*.

Antileprotic Drugs-Clofazimine, Thiambutosine, Dapsone*, Solapsone.

Anti-tubercular Drugs-Isoniazid*, PAS*, Streptomycin, Rifampicin, Ethambutol*, Thiacetazone, Ethionamide, Cycloserine, Pyrazinamide*.

Antiamoebic and Anthelmintic Drugs- Emetine, Metronidazole*, Halogenated

hydroxyquinolines, diloxanidefuroate, Paramomycin Piperazine*, Mebendazole, D.E.C*,.

Antibiotics-Benzyl Penicillin*, Phenoxy methyl Penicillin*, Benzathine Penicillin Ampicillin*, Cloxacillin, Carbenicillin, Gentamicin, Neomycin , Erythromycin , Tetracycline, Cephalexin, Cephaloridine , Cephalothin, Griseofulvin , Chloramphenicol.

Antifungal agents-Undecylenic acid, Tolnaftate, Nystatin, Amphotericin, Hamycin.

Antimalarial Drugs-Chloroquine*, Amodiaquine, Primaquine, Proguanil, Pyrimethamine*, Quinine, Trimethoprim.

Tranquilizers-Chlorpromazine*, Prochlorperazine, TrifluoPerazine, Thiothixene, Haloperidol*, Triperidol, Oxypertine, Chlordiazepoxide, Diazepam*, Lorazepam, Meprobamate.

Hypnotics"Phenobarbitone*, Butobarbitone, Cyclobarbitone, Nitrazepam, Glutethimide*, Methyprylone, Paraldehyde, Triclofos sodium.

General Anaesthetics-Halothane*, Cyclopropane*, Diethyl ether*, Methohexital sodium, Thiopental sodium, Trichloroethyelene.

Antidepressant Drugs-Amitriptyline, Nortryptyline, Imipramine*, Phenelzine, Tranylcypromine.

Analeptics-Theophylline, Caffeine*,Coramine*, Dextroamphetamine.

Adrenergic Drugs-Adrenaline*, Noradrenaline, Isoprenaline*, Phenylephrine Salbutamol, Terbutaline, Ephedrine *, Pseudoephedrine.

Adrenergic Antagoinst-Tolazoline, Propranolol*, Practolol.

Cholinergic Drugs-Neostigmine*,Pyridostigmine, Pralidoxime, Pilocarpine, Physostigmine*. Cholinergic Antagonists-Atropine*, Hysocine, Homatropine, Propantheline*, Benztrophine, Tropicamide, Biperiden.*

Diuretic Drugs-Furosemide*,Chlorothiazide, Hydrochlorothaizide*, Benzthiazide, Urea*,Mannitol *, Ethacrynic Acid.

Cardiovascular Drugs-Ethyl nitrite*, Glyceryl trinitrate, Alpha methyl dopa, Guanethidine, Clofibrate, Quinidine.

Hypoglycemic Agents-Insulin, Chlorpropamide*, Tolbutamide, Glibenclamide, Phenformin *, Metformin.

Coagulants and Anti-Coagulants-Heparin, Thrombin, Menadione*, Bishydroxycoumarin, Warfarin Sodium.

Local Anaesthetics-Lignocaine*, Procaine*, Benzocaine.

Histamine and Antiâ€“histaminic Agents-Histamine, Diphenhydramine*, Promethazine, Cyproheptadine, Mepyramine, Pheniramine, Chlorpheniramine*.

Analgesics and Anti-pyreticsâ€“Morphin, Pethidine*, Codeine, Methadone, Aspirin*, Paracetamol*, Analgin, Dextropropoxyphene, Pentazocine.

Non-steroidal anti-inflammatory Agents-Indomethacin*, phenylbutazone*, Oxyphenbutazone, Ibuprofen, Thyroxine and Antithyroids-Thyroxine*, Methimazole, Methylthiouracil, Propylthiouracil.

Diagnostic Agents-Iopanoic Acid, Propyliodone, Sulfobromophthalein. Sodium indigotindisulfonate, Indigo Carmine, Evans blue, Congo Red, Fluorescein Sodium .

*Anticonvulsants, cardiac glycosides, Antiarrhythmic antihypertensives & vitamins.

Steroidal Drugs-Betamethazone, Cortisone, Hydrocortisone, prednisolone, Progesterone, Testosterone, Oestradiol, Nandrolone.

Anti- Neoplastic Drugs-Actinomycins, Azathioprine, Busulphan, Chlorambucil, Cisplatin cyclophosphamide, Daunorubicin hydrochloride, Fluorouracil, Mercaptopurine, Methotrexate, Mytomycin.

DPH-202P PHARMACEUTICAL CHEMISTRY-II (Practical)

1. Systematic qualitative testing of organic drugs involving Solubility determination, melting point and boiling point, detection of elements and functional groups (10 compounds).
2. Official identification test for certain groups of drugs included in the I.P like barbiturates, sulfonamides, phenothiazine, Antibiotic etc (8 compounds).
3. Preparation of three simple organic preparations.

Books Recommended :(Latest editions)

1. Pharmocopoeia of India.
2. British Pharmaceutical Codex.
3. Martindale: The Extra Pharmacopoeia.
4. Medicinal and Pharmaceutical Chemistry by H. Singh, V. K. Kapoor, Vallabh Prakashan, Delhi.
5. A Text Book of Pharmaceutical Chemistry-II by Dr. A. V. Kasture, Dr. S. G. Wadokar, Nirali Prakashan, Pune.
6. Handbook of Pharmaceutical Chemistry-II by H. R. Batra, VallabhPrakashan, Delhi.

DPH-203 PHARMACOLOGY & TOXICOLOGY

Scope: The subject impart the knowledge about the drugs like, classification, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with the adverse effects, uses, drug-drug interactions, doses, contraindications and routes of administration of different classes of drugs.

Objectives: After completion of the course the student should be able to

1. Know the pharmacological actions of different classes of drugs.
2. Describe the mechanism of drug action and apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
3. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments.
4. Appreciate correlation of pharmacology with related medical sciences.

Course Content:

1. Introduction to Pharmacology, scope of Pharmacology.
2. Routes of administration of drugs, their advantages and disadvantages.
3. Various processes of absorption of drugs and the factors affecting them, Metabolism, distribution and excretion of drugs.
4. General mechanism of drugs action and the factors which modify drug action.
5. Pharmacological classification of drugs. The discussion of drugs should emphasise the following aspect:

(i) Drugs acting on the Central Nervous System:

(a) General anaesthetics, adjunction to anaesthesia, intravenuous anasesthetics.

(b) Analgesic antipyretics and non-steroidal anti-inflammatory drugs, Narcotic analgesics, Antirheumatic and antigout remedies, Sedatives and Hypnotics, Psychopharmacological agents, anti convulsants, analeptics.

(c) Centrally acting muscle relaxants and anti parkinsonism agents

(ii) Local anaesthetics.

(iii) Drug acting on autonomic nervous system.

(a) Cholinergic drug, Anticholinergic drugs, anti cholinesterase drugs.

(b) Adrenergic drugs and adrenergic recepter blockers.

(c) Neurones blockers and ganglion blockers.

(d) Neuromuscular blockers, drugs used in myasthenia gravis.

(iv) Drugs acting on eye, mydriatics, drugs used in glaucoma.

(v) Drugs acting on respiratory system-Respiratory stimulants, Bronchodilators, Nasal decongestants, Expectorants and Antitussive agents.

(vi) Antacids, Physiological role of histamine and serotonin, Histamine and Antihistamines, Prostaglandins.

(vii) Cardio Vascular drugs, Cardiotonics, Antiarrhythmic agents, Antianginal agents, Antihypertensive agents, Peripheral Vasodilators and drugs used in atherosclerosis.

(viii) Drugs acting on the blood and blood forming organs. Haematinics, Coagulants and anti Coagulants, Haemostatics, Blood substitutes and plasma expanders.

(ix) Drugs affecting renal function-Diuretics and antidiuretics.

(x) Hormones and hormone antagonists-hypoglycemic agents, Antithyroid drugs, sex hormones and oral contraceptives, corticosteroids.

(xi) Drugs acting on digestive system-Carminatives, digestants Bitters, Antacids and drugs used in Peptic ulcer, purgatives, and laxatives, Antidiarrhoeals, Emetics, Antiemetics, Anti-spasmodics.

Chemotherapy of microbial disease ;Urinary antiseptics, Sulphonamides, Penicillins, Streptomycin, Tetracylines and other antibiotics, Antitubercular agents, Antifungal agents, antiviral drugs, antileprotic drugs.

6. Chemotherapy of protozoal diseases Anthelmintic drugs.
7. Chemotherapy of cancer.
8. Disinfectants and antiseptics.

A detailed study of the action of drugs on each organ is not necessary.

DPH-203P PHARMACOLOGY (Practical)

The first six of the following experiments will be done by the students while the remaining will be demonstrated by the teacher.

1. Effect of K+, Ca++, acetylcholine and adrenaline on frog's heart.
2. Effect of acetylcholine on rectus abdominis muscle of Frog and guinea pig ileum.

3. Effect on spasmogens and relaxants on rabbits intestine.
4. Effect of local anaesthetics on rabbit cornea.
5. Effect of mydriatics and miotics on rabbits eye.
6. To study the action of strychnine on frog.
7. Effect of digitalis on frog's heart.
8. Effect of hypnotics in mice.
9. Effect of convulsants and anticonvulsant in mice or rats.
10. Test for pyrogen.
11. Taming and hypnosis potentiating effect of chlorpromazine in mice/rats.
12. Effect of diphenhydramine in experimentally produced asthma in guinea pigs.

Books Recommended :(Latest editions)

1. Essentials of Medical Pharmacology by K.D.Tripathi, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
2. Modern Pharmacology with clinical Applications by Charles R.Craig & Robert.
3. Handbook of experimental pharmacology by S.K. Kulkarni. Vallabh Prakashan, 101

DPH-204 PHARMACEUTICAL JURISPRUDENCE

Scope: This course is designed to impart basic knowledge on important legislations related to the profession of pharmacy in India.

Objectives: Upon completion of the course, the student shall be able to understand:

1. The code of ethics during the pharmaceutical practice.
2. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
3. Various Indian pharmaceutical acts and laws.
4. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.

Course Content:

1. Origin and nature of Pharmaceutical legislation in India, its scope and objectives. Evolution of the "Concept of Pharmacy" as an integral part of the Health Care System.

2. Principles and significance of Professional Ethics. Critical study of the code of Pharmaceutical Ethics drafted by Pharmacy Council of India.

3. Pharmacy Act, 1948-The General study of the Pharmacy Act with special reference to Education Regulations, working of State and Central Councils, constitution of these councils and functions, Registration procedures under the Act.

4. The Drugs and Cosmetics Act, 1940â€"General study of the Drugs and Cosmetics Act and the Rules thereunder. Definitions and salient features related to retail and wholesale distribution of drugs. The powers of Inspectors, the sampling procedures and the procedure and formalities in obtaining licences under the rule. Facilities to be provided for running a Pharmacy effectively. General study of the Schedules with special reference of schedules C, C1, F, G, J, H, P and X and salient features of labelling and storage condition of drugs.

5. The Drug and Magic Remedies (Objectionable Advertisement) Act, 1945-General study of the Act Objectives, special reference to be laid on Advertisements. Magic remedies and objectionable and permitted advertisements-disease which cannot be claimed to be cured.

6. Narcotic Drugs and Psychotropic Substances Act, 1985-A brief study of the act with special reference to its objectives, offences and punishment.

7. Brief introduction to the study of the following acts.

1. Latest Drugs (Price Control) Order in force.
2. Poisons Act 1919 (as amended to date)
3. Medicinal and Toilet Preparations (Excise Duties) Act, 1995 (as amended to date)
4. Medical Termination of Pregnancy Act, 1971 (as amended to date)

BOOKS RECOMMENDED (Latest edition)

1. Bare Acts of the said laws published by Government.
2. Pharmaceutical Jurisprudence by Dr. B. S. Kuchekar, Nirali Prakashan, New Delhi.
3. 3. Pharmaceutical Jurisprudence by Vinita Patole and K. D. Lone. Tech-Neo Publications LLP, Pune, Maharashtra.

DPH-205 DRUG STORE AND BUSINESS MANAGEMENT

Scope: The course aims to provide knowledge about the business management, inventory and accountancy related to pharmacy

Objectives: After completion of the syllabus students shall able to know-

1. About the basics of trade and economy.
2. About the management of pharmacy and drug stores.
3. Startup the business in pharmaceutical sector
4. About the legal requirements of opening of a drug store.
5. Responsibilities of a pharmacist, various methods of promotion, sales and marketing
6. Strategies to promote business and to grow in the market.
7. Understands about the concept of accounting, stock management and banking systems.

Course Content:

Part-I Commerce

1. Introduction-Trade, Industry and Commerce, Functions and subdivision of Commerce, Introduction of Elements of Economics and Management.
2. Forms of Business Organizations.
3. Channels of Distribution.
4. Drug House Management-Selection of Site, Space Lay-out and legal requirements. Importance and objectives of Purchasing, selection of suppliers, credit information, tenders, contracts and price determination and legal requirements thereto.
   Codification, handling of drug stores and other hospital supplies.
5. Inventory Control-objects and importance, modern techniques like ABC, VED analysis, the lead time, inventory carrying cost, safety stock, minimum and maximum stock levels, economic order quantity, scrap and surplus disposal.
6. Sales Promotion, Market Research, Salesmanship, qualities of a salesman, Advertising and Window Display.
7. Recruitment, training, evaluation and compensation of the pharmacist.
8. Banking and Finance Service and functions of the bank, Finance Planning and sources of finance.

Part-II Accountancy

1. Introduction to the accounting concepts and conventions, Double entry Book keeping,

Different kinds of accounts.

2. Cash Book.
3. General Leger and Trial Balance.
4. Profit and Loss Account and Balance Sheet.
5. Simple technique of analysing financial statements.

Introduction to Budgetting.

Books Recommended (Latest edition)

1. Remington's Pharmaceutical Sciences.
2. Drug Store and Business Management(Including Accountancy) by Mohammad Ali and Jyoti Gupta, CBS Publishers & Distributors, New Delhi, India.
3. Drug Store and Business Management by R. M. Mehta, VallabhPrakashan, Delhi.
4. Handbook of Drug Store and Business Management by A. K. Gupta, CBS Publishers & Distributors, New Delhi, India.

DPH-206 HOSPITAL AND CLINICAL PHARMACY

Scope: This course is designed to impart a fundamental knowledge on the Hospital Pharmacy and Clinical Pharmacy including drug information, drug distribution and therapeutic drug monitoring for improved patient care.

Objectives: Upon completion of the course student shall be able:

1. To understand the functions and objectives of hospital pharmaceutical services.
2. To know about requirements and abilities required for hospital pharmacists.
3. To understand the drug distribution system in hospitals.
4. To understand the ordinary daily terminology used in the practice of medicine.
5. To understand the drug interactions, adverse drug reactions and bio-availability of drugs.

Course Content:

Part-I Hospital Pharmacy

1. Hospitals Definition, Function, Classifications based on various criteria, organisation, Management and Health delivery system in India.

2. Hospital Pharmacy:

(a) Definition

(b) Functions and objectives of Hospital Pharmaceutical services.

(c) Location, Layout, Flow chart of material and men.

(d) Personnel and facilities requirements including equipments based on individual and basic needs.

(e) Requirements and abilities required for Hospital pharmacists.

3. Drug Distribution system in Hospitals:

(a) Out-patient services

(b) In-patient services-(a) types of services (b) detailed discussion of unit Dose system, Floor ward stock system, Satellite pharmacy services, Central sterile services, Bed Side Pharmacy.

4. Manufacturing:

(a) Economical considerations, estimation of demand.

(b) Sterile manufacture-large and small volume parenterals, facilities, requirements, layout production planning, man-power requirements.

(c) Non-sterile manufacture-Liquid orals, externals-bulk concentrates.

(d) Procurement of stores and testing of raw materials.

5. Nomenclature and uses of surgical instruments and Hospital Equipments and health accessories.

6. P.T.C (Pharmacy Therapeutic Committee), Hospital Formulary System and their organisation, functioning, composition.

7. Drug Information service and Drug Information Bulletin.

8. Surgical dressing like cotton, gauze, bandages and adhesive tapes including their pharmacopoeial tests for quality. Other hospital supply e.g I.V sets B.G sets, Ryals tubes, Catheters, Syringes etc.

9. Application of computer in maintenance of records, inventory control, medication monitoring, drug information and data storage and retrieval in hospital and retail pharmacy establishments.

Part-II Clinical Pharmacy

1. Introduction to Clinical Pharmacy Practice-Definition, scope.

2. Modern dispensing aspects-Pharmacists and Patient counselling and advice for the use of common drugs, medication history.

3. Common daily terminology used in the Practice of Medicine.

4. Disease, manifestation and pathophysiology including salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardiovascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

5. Physiological parameters with their significance.

6. Drug Interactions:

(a) Definition and introduction.

(b) Mechanism of Drug Interaction.

(c) Drug-drug interaction with reference to analgesics, diuretics, cardiovascular drugs, Gastro-intestinal agents, Vitamins and Hypoglycemic agents.

(d) Drug-food interaction.

7. Adverse Drug Reactions.:

(a) Definition and Significance.

(b) Drug-induced diseases and Teratogenicity.

8. Drugs in Clinical Toxicity-Introduction, general treatment of poisoning, systematic

antidotes. Treatment of insecticide poisoning, heavy metal poison, Narcotic drugs, Barbiturate, Organophosphours poisons.

9. Drug dependences, Drug abuse, addictive drugs and their treatment, complications.
10. Bio-availability of drugs, including factors affecting it.

DPH-206P HOSPITAL & CLINICAL PHARMACY (Practical)

1. Know the uses of the surgical instruments & hospital equipments used in the hospital.
2. Study & demonstrate various sterilization equipments & methods.
3. Perform various pharmacopoeial tests on absorbent cotton wool.
4. Perform the identification test for D-glucose (Dextrose) and limit test for chloride and sulphate as specified in I.P.
5. Study various equipments, materials and clothing used in aseptic techniques.
6. Perform the pharmacopoeial tests on sterile water for injection.
7. Study & determine the bleeding & clotting time of blood.
8. Study & perform pharmacopoeial tests for quality on surgical dressings like cotton, gauze, bandages and adhesive tapes.
9. Categorization and storage of Pharmaceutical products based on legal requirements of labelling and storage.
10. Project report on visit to the nearby Community for Counselling on the rational use of drugs and aspects of health care.
11. Prescription handling and identification of drug interactions & incompatibilities.
12. Health screening services and study of equipments for:-
    A. Blood glucose determination (Glucometer)
    B. Blood pressure (BP apparatus)
    C. Lung function test (Peak flow meter)
13. Design of community pharmacy to incorporate all pharmaceutical care services (as per schedule N).
14. Study of OTC medications List & Available brands.
15. Interpretation of various pathological reports of blood and urine.

Books recommended (Latest editions)

1. Remington's Pharmaceutical Sciences.
2. Martindale: The Extra Pharmacopoeia
3. Drugs Pharmacology by Maheshwari, K. K. Vallabh Prakashan, Delhi.
4. Basic & Clinical Pharmacology by Katzung, B.G., Prentice Hall, International.
5. Dispensing for Pharmaceutical Students by Carter S.J. Cooper and Gunn's, CBS Publishers, Delhi.
6. "A text book of hospital and clinical pharmacy" Theory and Practical by N. Pratibha & R. K. Khar, Birla publications (p) Ltd Delhi.