K. R. MANGALAM UNIVERSITY

THE COMPLETE WORLD OF EDUCATION

School of Medical & Allied Sciences

Diploma in Pharmacy
(D. Pharm)

Program Code: 31

2019-2021

Approved in the 20th Meeting of Academic Council Held on 16 July 2019

Academic Council
Member Secretary
K.R. Mangalam University

Registrar
K.R. Mangalam University
Sohna Road, Gurugram, (Haryana)

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PREFACE

The objective of any program at Higher Education Institute is to prepare their students for the society at large. The K. R. Mangalam University envisions all its programs in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses. The Under-Graduate Programmes will prepare the students for both, academia and employability. Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the diploma level. The diploma attributes encompass values related to critical thinking and skills for employability. In short, each programme prepares students for sustainability and life-long learning. The PCI approved curriculum of D. Pharmacy offer in depth knowledge of ever changing field of pharmacy with focus on latest developments in drug design and discovery. After D Pharm, students get registered in state pharmacy council and as registered Pharmacist may work at drug stores in Government Hospitals, Private Hospitals, Clinics, Community Health Centers or Private Drug Stores. They may even start their own Drug store (Entrepreneurship) and online Pharmacy. Pharmacist can also work as Medical sales Representative and as Manufacturing and Quality Control Chemist in Pharmaceutical Industries. The K. R. Mangalam University hopes the curriculum of the programme D. Pharmacy will help students in making an informed decision at the time of working in any private or government services.

ACKNOWLEDGEMENT

The development of Curriculum for Undergraduate diploma course in Pharmacy is a result of thoughtful deliberations at various stages of dedicated and specialized experts. This curriculum has been framed to meet the expectations of an academically challenging environment, develop problem-solving skills by students, align with current standards and to enrich the students to make them self-enablers and/or match job requirements on successful completion of their degrees.

I wish to acknowledge all our experts who have been involved in the process of developing this outcome-based curriculum for D. Pharmacy. We are thankful to Dr. Pankaj Gupta, with his team of Academic and Industry experts who were devotedly committed towards framing this curriculum.

I am greatly gratified Ms. Manvi Arora for her supervision contribution, guidance, and support throughout the development of this curriculum.

Special thanks and gratitude to Prof. Aditya Malik, Vice Chancellor, K.R. Mangalam University, who have been instrumental and encouraging throughout the process of developing this curriculum.

Last, but not the least, I also sincerely thank to Mr. Vinod Kumar and Dr. Nitin Kumar who have contributed for development of this curriculum.

Dean
School of Medical & Allied Sciences

CONTENTS

1. INTRODUCTION

The K.R. Mangalam Group has made a name for itself in the field of education. The K.R. Mangalam story goes back to the chain of schools that offered an alternative option of world-class education, pitching itself against the established elite schools, which had enjoyed a position of monopoly till then. Having blazed a new trail in school education, the focus of the group was aimed at higher education.

K.R. Mangalam University is the fastest-growing higher education institute in Gurugram, India. K. R. Mangalam University was established under the Haryana Private University Act 2006, received the approval of Haryana Legislature vide Amendment Act # 36 of 2013 and consent of the Hon'ble Governor of Haryana on 11th April 2013, which was published in the Gazette notification vide Leg. No.10/2013, dated 3rd May 2013.

Since its inception in 2013, the University has been striving to fulfil its prime objective of transforming young lives through ground-breaking pedagogy, global collaborations, and world-class infrastructure. Resources at K.R Mangalam University have been continuously upgraded to optimize opportunities for the students. Our students are groomed in a truly interdisciplinary environment where they grow up with integrative skills through interaction with students from engineering, social sciences, management and other study streams.

K. R. Mangalam University is unique because of its

1. Enduring legacy of providing education to high achievers who demonstrate leadership in diverse fields.

2. Protective and nurturing environment for teaching, research, creativity, scholarship, social and economic justice.

Objectives

1. Enhance leadership qualities among the youth having understanding of ethical values and environmental realities.
2. Foster employability and entrepreneurship through futuristic curriculum and progressive pedagogy with cutting-edge technology.
3. Instill notion of lifelong learning through stimulating research, outcomes-based education and innovative thinking.
4. Integrate global needs and expectations through collaborative programs with premier universities, research centers, industries and professional bodies.

2. About School

The School of Medical & Allied Sciences (SMAS) at K. R. Mangalam University started in the

year 2013 after being duly approved by the Pharmacy Council of India (PCI). The SMAS comprises of modular laboratories equipped with state-of-the-art facilities and infrastructure. The School of Medical and Allied Sciences currently offers D. Pharm, B. Pharm, M. Pharm and PhD courses in Pharmacy. The Centre for Education Growth and Research adjudged School of Medical & Allied Sciences, as Best Pharmacy College in India in March 2016 at India International Centre, New Delhi.

School Vision

To contribute towards healthcare needs of the society by producing a skilled, motivated and accessible workforce dedicated towards achieving health for all.

School Mission

M1: To produce self-motivated, self-reliant and socially sensitive young healthcare professionals catering to the needs of academia, industry and research.

M2: To create a centre of excellence for learning and research in the field of pharmaceutical and allied health sciences with inter-disciplinary approach in emerging area of science and technology with focus on industry-academia interaction.

M3: To nurture transformational research for the benefit of the society.

M4: To interlink pharmaceutical and allied health sciences with interdisciplinary life sciences.

3. Programs offered by School

3.1. Diploma in Pharmacy

The School of Medical & Allied Sciences (SMAS) at K. R. Mangalam University started in the year 2013 after being duly approved by the Pharmacy Council of India (PCI). The PCI approved D. Pharmacy program started in the year 2017 and aims to provide an extra edge to our students by teaching and training by leading pharma industry experts to facilitate industry academia interaction, participation in conferences / workshops / skill development programs and career guidance. The students are encouraged to participate in various health camps organized by the School to make general awareness amongst people regarding various diseases like diabetes, hypertension, communicable and non-communicable diseases and lay down the platform for students for getting jobs in various government and private institutions.

3.2. D. Pharmacy

Eligibility Criteria

The student should have passed the 10+2 examination conducted by the Central Board of

Secondary Education or equivalent examination from a recognized Board in Science stream with an aggregate of 50% or more.

Course Outline: Inorganic chemistry / Organic chemistry / Pharmaceutics / Analysis / Pharmaceutical Chemistry/Pharmacology/ Pharmacognosy

Career Opportunities

Students will get themselves registered in the state pharmacy council and the registered Pharmacists may work at drug stores in Government Hospitals, Private Hospitals, Clinics, Community Health Centers or Private Drug Stores. They may even start their own Pharmacy shop (Entrepreneurship) and online Pharmacy. Pharmacist can also work as Medical sales Representative and as Manufacturing and Quality Control Chemist in Pharmaceutical Industries.

4. PROGRAM DURATION

The program duration of Diploma in Pharmacy is

Name of the Program	**Duration**
D. Pharmacy	2 Years

5. CLASS TIMINGS

The class will be held from Monday to Friday from 9.10 A.M. to 4.00 P.M.

6. SCHEME OF STUDIES AND SYLLABI

The syllabi of the Pharmacy program offered by School of Medical & Allied Sciences are approved by PCI.

6.1 Syllabus of Diploma Pharmacy

The PCI approved syllabi of the D. Pharmacy programs offered by School of Medical & Allied Sciences is as follows -

	Year I	**Year II**
Courses	11	10
Credits	0	0

Scheme of Studies of D. Pharmacy –

D. Pharm- I Year

Subject Code	Course Title	L	P
DP101T	Pharmaceutics-I	3	
DP102T	Pharmaceutical Chemistry-I	3	
DP103T	Pharmacognosy	3	
DP104T	Biochemistry & Clinical Pathology	2	
DP105T	Human Anatomy & Physiology	3	
DP106T	Health Education & Community Pharmacy	2	
DP107P	Pharmaceutics-I Practical		4
DP108P	Pharmaceutical Chemistry-I Practical		3
DP109P	Pharmacognosy Practical		3
DP110P	Biochemistry & Clinical Pathology Practical		3
DP111P	Human Anatomy & Physiology Practical		2
D. Pharm- II Year			
DP201T	Pharmaceutics-II	3	
DP202T	Pharmaceutical Chemistry-II	4	
DP203T	Pharmacology & Toxicology	3	
DP204T	Pharmaceutical Jurisprudence	2	
DP205T	Drug Store and Business Management	3	
DP206T	Hospital and Clinical Pharmacy	3	
DP207P	Pharmaceutics-II Practical		4
DP208P	Pharmaceutical Chemistry-II Practical		3
DP209P	Pharmacology & Toxicology Practical		2
DP210P	Hospital and Clinical Pharmacy Practical		2

Course code	Course Title	L	T	P	C
DP101T	**Pharmaceutics-I**	**3**	**0**	**0**	**0**

Course Teacher (s):

Course Objectives:

Upon completion of this course the student should be able to understand

1. The formulation aspects of different dosage forms like tablets and capsules.
2. Different pharmacopoeias.
3. The evaluation of pharmaceutical dosage forms and their packaging.
4. The importance of good manufacturing practices.
5. Immunological products like vaccines, sera etc.
6. The concept of sterilization and different techniques employed in the process of sterilization.
7. Aseptic techniques employed in the process of sterilization.

Course Syllabus:

1. Introduction of different dosage forms. Their classification with examples-their relative applications. Familiarization with new drug delivery systems. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.
2. Metrology-System of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustment of products .Use of alligation method in calculations .Isotonic solutions.
3. Packaging of pharmaceuticals-Desirable features of a container and types of containers. Study of glass & plastics as materials for containers and rubber as a material for closure-their merits and demerits. Introduction to aerosol packaging. Size reduction, objectives, and factors affecting size reduction, methods of size reduction-study of Hammer mill, ball mill, Fluid energy mill and Disintegrator.
4. Size separation-size separation by sifting. Official standards for powders. Sedimentation methods of size separation. Construction and working of Cyclone separator.
5. Mixing and Homogenization-Liquid mixing and powder mixing, Mixing of semisolids. Study of silverson Mixer-Homogenizer, planetary Mixer; Agitated powder mixer; Triple Roller Mill; Propeller Mixer, colloid Mill and Hand Homogeniser. Double cone mixer.
6. 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.
7. Extraction and Galenicals-(a) Study of percolation and maceration and their modification, continuous hot extraction-Application in the preparation of tinctures and extracts.(b) Introduction to Ayurvedic dosage forms. Heat process-Evaporation-Definition-Factors affecting evaporation-study of evaporating still and Evaporating pan.
8. 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.

9. Introduction to drying process-Study of Tray Dryers; Fluidized Bed Dryer, Vacuum Dryer and Freeze Dryer.
10. Sterilization-Concept of sterilization and its differences from disinfection-Thermal resistance of microorganisms. Detailed study of the following sterilization process. Sterilization with moist heat, Dry heat sterilization, Sterilization by radiation, Sterilization by filtration and Gaseous sterilization.
11. Aseptic techniques-Applications of sterilization process in hospitals particularly with reference to surgical dressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.
12. Processing of Tablets-Definition; different type of compressed tables 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; films coating, enteric coating and micro-encapsulation (Tablet coating may be design in an elementary manner).
13. Processing of Capsules-Hard and soft gelatin capsules; different sizes of capsules; filling of capsules; handling and storage of capsules. Special applications of capsules.
14. Study of immunological products like sera, vaccines, toxoids & their preparations.

Text book [TB]:

1. Theory & Practice Of Industrial Pharmacy L. Lachman, Herbert A. Lieberman & J. Kanig 3rd, 1987 Lea & Febiger, Philadelphia
2. Cooper & Gunn's Dispensing For Pharmaceutical Students Revised By S. J. Carter 12th, 1987 CBS Publishers & Distributers
3. R.M Mehta Pharmaceutics -1

Reference book(s) [RB]:

1. Remington's Pharmaceutical Sciences.
2. The Extra Pharmacopoeia –Martindale.

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	-	-	
2	Sessional exams	1hr	20	
3	End-Term Examination	3 hrs	80	
		Total	100	

Course code	Course Title	L	T	P	C
DP102T	Pharmaceutical Chemistry-I	3	0	0	0

Course Teacher (s):

Course Objectives :

This subject is designed to impart fundamental knowledge of the different inorganic substances like

1. Acids and Bases, Antioxidants, Gastrointestinal agents, Dental products, Antimicrobial agents along with their physical and chemical properties.
2. This subject also includes a thorough understanding of the Quality Control of drugs and

pharmaceuticals, Radio pharmaceuticals and their applications.

Course Syllabus:

1. Acids, bases and buffers Boric acid*, Hydrochloric acid, strong ammonium hydroxide, Calcium hydroxide, Sodium hydroxide and official buffers.
2. Antioxidants, Hypophosphorous acid, Sulphur dioxide, Sodium bisulphite, Sodium metabisulphite, Sodium thiosulphate, Nitrogen and Sodium Nitrite.
3. 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.

4. Topical Agents-

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

(ii) Antimicrobial 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 fluoride, Stannous Fluoride, 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.

5. 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.

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

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.

7. 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.

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

Text book [TB]:

1. Chaudhary N C and Gurbani N K, Pharmaceutical Chemistry-1, Edition 2013, published by M K Jain Vallabh Prakashan, India.

Reference book(s) [RB]:

1. Pharmacopoeia of India.
2. British Pharmaceutical Codex.

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	-	-	
2	Sessional exams	**1 hr**	**20**	
3	End-Term Examination	**3 hrs**	**80**	
		Total	**100**	

Course code	Course Title	L	T	P	C
DP103T	**PHARMACOGNOSY**	**3**	**0**	**0**	**0**

Course Teacher (s):

Course Objectives:

1. Occurrence, distribution, isolation, identification tests of common phyto-constituents

2. Therapeutic activity and pharmaceutical applications of various natural drug substances and phyto-constituents

3. Biological source, chemical constituents of selected crude drugs and their therapeutic efficacy in common diseases and ailments

4. Basic concepts in quality control of crude drugs and various system of medicines

5. Applications of herbs in health foods and cosmetics.

Course Syllabus:

UNIT1. Definition, history and scope of Pharmacogonosy including indigenous system of medicine.

UNIT2. Various systems of classification of drugs and natural origin.

UNIT3. Adulteration and drug evaluation; significance of pharmacopoeial standards.

UNIT4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical application of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.

UNIT5. Occurrence, distribution, organoleptic evaluation, chemical constituents including Tests wherever applicable and therapeutic efficacy of following categories of drugs.

(a) Laxatives- Aloes, Rhubarb, 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- Catecheu.
(e) Drugs acting on nervous system- Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra, Opium, Cannabis, Nux -vominca.
(f) Antihypertensive- Rauwolfia.
(g) Antitussives- Vasaka, Tolu balsam, Tulsi.
(h) Antirheumatics- Guggal, Colchicum.
(i) Antitumour- Vinca.
(j) Antileprotics- Chaulmoogra oil.
(k) Antidiabetics- Pterocarpus, Gymnema sylvestro.
(l) Diuretics- Gokhru, Punarnava.
(m) Antidysenterics- Ipecacuanha.
(n) Antiseptics and disinfectants- Benzoin, Myrrh, Neem, Curcuma.
(o) Antimalarials- Cinchona.
(p) Oxytocics- Ergot.
(q) Vitamins- Shark liver oil and Amla.
(r) Enzymes- Papaya, Diastase, Yeast.
(s) Perfumes and flavoring agents- peppermint oil, Lemon oil, Orange oil, lemon grass oil, sandal wood.

UNIT6. Pharmaceutical aids-Honey, Arachis oil, starch, kaolin, pectin, olive oil. Lanolin, Beeswax, Acacia, Tragacanth, sodium Alginate, Agar, Guar gum, Gelatin.

UNIT 7. Miscellaneous- Liquorice, Garlic, picrorhiza, Dirscorea, Linseed, shatavari, shankhpushpi, pyrethrum, Tobacco.
Collection and preparation of crude drugs for the market as exemplified by Ergot, opium, Rauwalfia, Digitalis, senna.

Study of source, preparation and identification of fibers used in sutures and surgical dressings-cotton ,silk, wool and regenerated fibers.

Gross anatomical studies of-senna , Datura, cinnamon, cinchona, fennal, clove, Ginger, Nuxvomica & Ipecac

Text book [TB]:

1. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
2. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37th Edition, Nirali Prakashan, New Delhi.

Reference book(s) [RB]:

1. W. C. Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Sounders & Co., London, 2007
2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9th Edn., Lea and Febiger, Philadelphia, 1988.
3. Text Book of Pharmacognosy by T.E. Wallis
4. Herbal drug industry by R.D. Choudhary (1996), Ist Edn, Eastern Publisher, New Delhi.
5. Essentials of Pharmacognosy, Dr. SH. Ansari, IInd edition, Birla publications, New Delhi, 2007

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	-	-	
2	Sessional exams	1	20	
3	End-Term Examination	3	80	
		Total	100	

Course code	Course Title	L	T	P	C
DP104T	Biochemistry and Clinical Pathology	2	0	0	0

Course Teacher (s):

Course Objectives:

Upon completion of the subject student shall be able to understand

1. Explain the chemistry and qualitative test of different food components like Carbohydrates, fats, lipids, protein's, amino acids etc.
2. Explain the concept, composition of blood and normal and abnormal constituents of urine.

3. Explain the concept of Enzymes and their role in pharmaceutical industry

Course Syllabus:

1. Introduction to biochemistry. Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.
2. Carbohydrates: Brief chemistry and role of carbohydrates, classification, qualitative tests, Diseases related to carbohydrate metabolism.
3. Lipids: Brief chemistry and role of lipids, classification and qualitative tests. Diseases related to lipids metabolism.
4. Vitamins: Brief chemistry and role of vitamins and coenzymes. Role of minerals and water in life processes.
5. Enzymes: Brief concept of enzymatic action. factors affecting it.
6. Therapeutics: Introduction to pathology of blood and urine. Lymphocytes and platelets, their role in health and disease. Erythrocytes-Abnormal cells and their significance. Abnormal constituents of urine and their significance in diseases.

Text book [TB]:

1. Biochemistry and clinical pathology by Rahul b. Lovhare, Dr. Md. Usama, Dr. Sunil P. Pawar.

Reference book(s) [RB]:

1. Biochemistry and clinical pathology by varun dutt sharma, S.K Pandey
2. Biochemistry and clinical pathology by by V.N Raje

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	-	-	
2	Sessional exams	**1hr**	**20**	
3	End-Term Examination	**3 hrs**	**80**	
		Total	**100**	

Course code	Course Title	L	T	P	C
DP105T	**Human Anatomy and Physiology- Theory**	**3**	**0**	**0**	**0**

Course Teacher (s): Mr Sanjeev Kumar

Course Objectives:

1. Structure and functions of the various organ systems and organs of the human body
2.Homeostatic mechanisms and their imbalances in the human body
3. Various vital physiological parameters of the human body and their significance.

Course Syllabus:

UNIT 1

Scope of Anatomy and physiology. Definition of various terms used in Anatomy.

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

UNIT 2

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

UNIT 3

Skeltal System: Structure and function of Skelton .Classification of joints and their Function, Joint disorders.

UNIT 4

Cardiovascular System: Composition of blood, functions of blood elements. Blood group and coagulation of blood. Brief information regarding disorders of blood.Name and functions of lymph glands. Structure and functions of various parts of the heart .Arterial and venous system with special reference to the names and positions of main arteries and veins. Blood pressure and its recording. Brief information about cardiovascular disorders.

UNIT5

Respiratory system: Various parts of respiratory system and their functions, physiology of respiration.

UNIT 6

Urinary System: Various parts of urinary system and their functions, structure and functions of kidney. Physiology of urine formation. Patho-physiology ofrenaldiseases and edema

UNIT 7

Muscular System: Structure of skeletal muscle, physiology of muscle contraction. Names, positions, attachments and functions of various skeletal muscles. Physiology of neuromuscular junction.

UNIT 8

Central Nervous System: Various parts of central nervous system, brain and itsparts, functions and reflex action. Anatomy and physiology of automatic nervous system.

UNIT 9

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

UNIT 10

Digestive System: names of various parts of digestive system and their functions. structure and functions of liver, physiology of digestion and absorption.

UNIT 11

Endocrine System: Endocrine glands and Hormones. Location of glands, their hormones and functions. Pituitary, thyroid. Adrenal and pancreas

UNIT 12

Reproductive system: Physiology and Anatomy of Reproductive system.

Text book [TB]:

1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.

2. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
3. Textbook of Human Histology by Inderbir Singh, Jaypee brother's medical publishers, New Delhi.

Reference book(s) [RB]:

1. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.

2. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterrje, Academic Publishers Kolkata

3. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA.

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	-	-	-
2	Sessional exams	**1 hr**	**20**	
3	End-Term Examination	**3 hrs**	**80**	
		Total	**100**	

Course code	Course Title	L	T	P	C
DP106T	**Health Education and Community Pharmacy**	**2**	**0**	**0**	**0**

Course Teacher (s): Ms Vipula

Course Objectives:

Upon completion of this course the student should be able to understand

1. This subject is designed to impart fundamental knowledge on the different components of foods and deficiency diseases.
2. It also helps in understanding the different methods used for family planning
3. The subject provides the basic knowledge required to understand the effect of environment on human health.
4. It enlightens the students about the fundamental principles of microbiology
5. It also deals with the causes of intestinal infections

Course Syllabus:

1. Concept of health: Definition of physical health, mental health, social health, spiritual health determinants of health, indicatory 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, diseases induced due to deficiency of proteins, vitamins and minerals-treatment and prevention. Demography and family planning: Demography cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives, population problem of India.
3. First aid: Emergency treatment in shock, snake-bite, burns, poisoning, heart disease, fractures and resuscitation methods, Elements of minor surgery and dressings.
4. Environment and health: Source 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.

5. Fundamental principles of microbiology: Classification of microbes, isolation, staining techniques of organisms of common diseases.
6. Communicable diseases: Causative agents, mode of transmission and prevention. Respiratory infections chicken pox, measles, influenza, diphtheria, whooping cough and tuberculosis.
7. Intestinal infection-poliomyelitis, Hepatitis, cholera, Typhoid, food poisoning, Hookworm infection.
8. Arthropod borne infections-plague, Malaria, filariases.
9. Surface infection-Rabies, Tranchoma, Tetanus, Leprosy.
10. Sexually transmitted diseases-Syphilis, Gonorrhoea, AIDS.
11. Non-communicable diseases: causative agents, prevention, care and control.
12. 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 procedures, for-faces, urine, sputum, room linen, dead-bodies, instruments.

Text book [TB]:

1. **Health Education and Community Pharmacy; N.S. parmar.**
2. **Health Education and Community Pharmacy; V.N. Raje.**

Reference book(s) [RB]:

3. Adult Drug information Hand Out edition 29; Lexicomp publications

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	-	-	
2	Sessional exams	**1 hr**	**20**	
3	End-Term Examination	**3 hr**	**80**	
		Total	**100**	

Course code	Course Title	L	T	P	C
DP107P	**Pharmaceutics-I Practical**	**0**	**0**	**4**	**0**

Course Teacher (s): Ms Sujata

Course Objectives:

Upon completion of this course student will

1. Explain about the preparation and dispensing different formulations like aromatic
2. waters, solutions and spirits
3. Explain the different extraction processes like maceration and percolation.
4. Explain the formulations of topical preparations like creams and ointments.
5. Explain the manufacturing of dosage forms like tablets and capsules.
6. Explain the formulation of parenteral.

Course Syllabus:

1.Aromatic Waters
2. Solutions
3. Spirits
4. Tinctures
5. Extracts
6. Creams
7. Cosmetic Preparations
8. Capsules
9. Tablets
10. Preparations involving ophthalmic preparations
11. Preparations involving aseptic techniques

Text book [TB]:

1. Practical Pharmaceutics -1 by Dr. PV Kasture, S.B Gokhle

Reference book(s) [RB]:

1. Remington's Pharmaceutical Sciences
2. The extra Pharmacopoeia – Martindale

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	-	-	
2	Sessional exams	**1 hr**	**20**	
3	End-Term Examination	**3 hrs**	**80**	
		Total	**100**	

Course code	Course Title	L	T	P	C
DP108P	**Pharmaceutical Chemistry-I**	**0**	**0**	**3**	**0**

Course Teacher (s): Ms Harshita

Course Objectives :

This subject is designed to impart

1. Fundamental knowledge on different Acid- Base titrations and limit tests for detection of metals.

Course Syllabus:

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.

i. Acid-Base titrations (at least 3)

ii. Redox titrations (one each of permanganometry and iodimetry).
iii. Precipitation titrations (at least 2)
iv. Complexometric titration (Calcium and Magnesium)

Text book [TB]:

1. Bhagel U.S., Singh D. and Sing A., Practical book for Pharmaceutical Chemistry and analysis, Edition 2017.
2. Siddiqui A. A., Ali M., Practical Pharmaceutical Chemistry, CBS Publishers & Distributors Pvt. Ltd. Edition 2019.

Reference book(s) [RB]:

1. Pharmacopoeia of India.
2. British Pharmaceutical Codex.

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	**Continuous mode**	**-**	**-**	
2	**Sessional exams**	**1hr**	**20**	
3	**End-Term Examination**	**3 hrs**	**80**	
	Total		**100**	

Course code	Course Title	L	T	P	C
DP109P	**Pharmacognosy**	**0**	**0**	**3**	**0**

Course Teacher (s): Mr Pankaj Vyas

Course Objectives:

1. Identification of the crude drugs based on their morphological characteristics
2. Various characteristic anatomical characteristics of the herbal drugs studied through transverse section
3. Physical and chemical tests to evaluate the crude drugs

Course Syllabus:

1. **Morphological Identification of the following drugs:** Ispaghula, Senna, Coriander, Fennel, Cardamom, Ginger, Nutmeg, Black Pepper, Cinnamon, Clove, Ephedra, Rauwolfia, Cinchona.

2. **Gross anatomical studies (Transverse Section) of the following drugs:** the following drugs : Senna, Datura, cinnamon, cinchona, coriander, fennel , clove, Ginger, Nux-vomica, Ipecacuanha.

3. **Physical and chemical tests for evaluation of any FIVE of the following drugs:** Asafoetida, Benzoin, Pale catechu, Black catechu, Castor oil, Acacia, Tragacanth, Agar, Guar gum, Gelatine.

4. Identification of fibers and surgical dressing.

Text book [TB]:

1. A Laboratory Manual of Pharmacognosy by Ahmad S.
2. Text book of Practical Pharmacognosy by C.K. Kokate.

Reference book(s) [RB]:

1. Pharmacognosy by Trease & Evans.
2. Practical Pharmacognosy: C.K. Kokate, Purohit, Gokhlae

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date
1	Continuous mode	-	-	
2	Sessional exams	**1 hr**	**20**	
3	End-Term Examination	**3 hrs**	**80**	
		Total	**100**	

Course code	Course Title	L	T	P	C
DP110P	**Biochemistry and Clinical Pathology Practical**	**0**	**0**	**3**	**0**

Course Teacher (s):

Course Objectives:

Upon completion of this course student will

1. Physical, chemical properties and qualitative tests of lipids, carbohydrates, proteins, amino acids
2. Analysis of normal and abnormal constituents of blood and urine
3. Microscopic examination of sputum and faecus
4. Practice in injecting drugs by intramuscular, subcutaneous and intravenous routes.
5. Withdrawal of blood sample

Course Syllabus:

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, cretinine, cholesterol, alkaline phosphatatase acid phosphatase, Bilirubin, SGPT, SGOT, calcium, Diastase, Lipase).
3. Examination of sputum and faeces (microscopic & staining).
4. Practice in injecting drugs by intramuscular, subcutaneous and intravenous routes, withdrawal of blood samples.

Text book [TB]:

1. S.R. Kale et al Practical biochemistry and clinical pathology, Nirali Prakashan, India

Reference book(s) [RB]:

1. Varun Dutt Sharma, biochemistry and clinical pathology practical note book, CBS Publisher.

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	**Continuous mode**	-	-	
2	**Sessional exams**	**1hrs**	**20**	
3	**End-Term Examination**	**3 Hr**	**80**	

		Total	**100**	

Course code	Course Title	L	T	P	C
DP111P	**Human Anatomy and Physiology Practical**	**0**	**0**	**2**	**0**

Course Teacher (s):

Course Objectives:

Upon completion of this course student will

1. To know about human body.
2. To know about different systems of body.
3. To know about different muscles and tissue of body.
4. To determine the clotting time of blood.
5. To record the pulse, heart rate, Blood pressure of Human Body

Course Syllabus:

1. Study of the human Skelton.
2. Study with the help of charts and models of the following system and organs: Digestive system, Respiratory system, Ear, Cardiovascular system, Urinary system, Reproductive system, Eye
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 RBCs, clotting time of blood, erythrocyte sedimentation rate and Hemoglobinvalue.
6. Recording of body temperature, pulse, heart-rate, blood pressure and ECG.

Text book [TB]:

1. Sangeeta Dwivedi, Narendra Vyas, Sapna Malviya, A practical book of Human anatomy and physiology, Pee Vee Publishers.

Reference book(s) [RB]:

1. Sangeeta Dwivedi, Narendra Vyas, Sapna Malviya, A practical book of Human anatomy andphysiology, Pee Vee Publishers.

Evaluation Scheme:

	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue
1	Continuous mode	**-**	**-**	
2	Sessional exams	**1hr**	**20**	
3	End-Term Examination	**3 hrs**	**80**	
		Total	**100**	

Course Code	Course Title	L	T	P	S	C
DP201T	**Pharmaceutics II**	**3**	**0**	**0**	**0**	**0**

Course Teacher(s):

COURSE OBJECTIVES

This course will discuss about basic concepts of

1. Know the history of profession of pharmacy
2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
3. Understand the professional way of handling the prescription
4. Preparation of various conventional dosage

COURSE SYLLABUS

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

Incompatibilities in prescriptions- study of various types of incompatibilities-physical, chemical and therapeutic.

Posology- Dose and dosage of drugs, factors influencing dose, calculations of doses on the basis of age, sex, surface area and veterinary doses.

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 labeling requirements and storage conditions should be high-lighted).

Powders-Type 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 a material below the minimum weighable amount, geometric dilution and proper usage and care of dispensing balance.

Liquid oral Dosage forms: **Monophasic**-Theoretical aspects including commonly used vehicles, essential adjuvant like stabilizers, colorants and flavors, 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 mucous membranes Mixtures and concentrates, Gargles Syrups Mouth washes Throat-paints Elixirs Douches Ear Drops Nasal drops Sprays Liniments Lotions.

Biphasic Liquid Dosage Forms: Suspensions (elementary study)-Suspensions containing diffusible solids and liquids and their preparations. Study of the adjuvant 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.

Emulsions-Types of emulsions, identification of emulsion system, formulation of emulsions, selection of emulsifying agent. Instabilities in emulsions, preservation of emulsions.

Semi-Solid Dosage Forms: Ointments: Types of ointments, classification and selection of dermatological vehicles. Preparation and stability of ointments by the following processes: Trituration fusion chemical reaction Emulsification.

Pastes: Differences between ointments and pastes, Bases of pastes. preparation of pastes and their preservation .

Jellies: An introduction to the different types of jellies and their preparation. An elementary study of poultice.

Suppositories and peassaries-Their relative merits and demerits, types of suppositories, suppository bases , classification, properties. preparation and packing of suppositories. Use of suppositories of drug absorption.

Dental and cosmetic preparations: Introduction to Dentifrices, facial cosmetics, Deodorants.

Antiperspirants, shampoo, Hair dressings and Hair removers.

Sterile Dosage forms:

Parenteral dosage forms-Definition, General requirements for parenteral dosage forms. Types of parenteral formulations, vehicles, adjuvant, processing and personnel, Facilities and quality control. Preparation of Intravenous fluids and admixtures-Total parenteral nutrition, Dialysis fluids.

Sterility testing: particulate matter monitoring- Faculty seal packaging. Ophthalmic products: study of essential characteristics of different ophthalmic preparations. Formulation: additives, special precautions in handling and storage of ophthalmic products.

TEXTBOOK [TB]

1.R. M. Mehta, Pharmaceutics-II, Vallabh Prakashan publishers, 2003, 286.
2. Carter S.J., Cooper and Gunn's-Dispensing for Pharmaceutical Students, CBS publishers, New Delhi.
3. M.E. Aulton, Pharmaceutics, The Science& Dosage Form Design, Churchill Livingstone, Edinburgh.
4. Lachmann. Theory and Practice of Industrial Pharmacy, Lea&Febiger Publisher, The University of Michigan.
5. Alfonso R. Gennaro Remington. The Science and Practice of Pharmacy, Lippincott Williams, New Delhi.
6. Carter S.J., Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.

REFERENCE BOOK [RB]

1. Remington's Pharmaceutical Sciences.
2. The Extra Pharmacopoeia-Martindale.

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date, Time & Venue
1.	Continuous mode	-	-	
2.	Sessional exams	1 hr	20	
3.	End-Term Examination	3 hrs	80	
4.				
		Total	**100**	

Teacher(s) Contact: Students can contact the Course Teacher(s) in his/her chamber for consultation in the hour specified.

Course Code	Course Title	L	T	P	S	C
DP202T	PHARMACEUTICAL CHEMISTRY-II	4	0	0	0	0

Course Teacher(s):

COURSE OBJECTIVES

1. This subject is designed to understand the chemistry and nomenclature of drugs
2. This subject is to understand the pharmacological activity of various drugs.
3. To study physical and chemical properties of pharmaceutical organic compounds.
4. Medicinal uses of various drugs.

Course Syllabus:

1. Introduction to the nomenclature of organic chemical systems with particular reference to hetero-cyclic 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*, Benzalkonium chloride, Cetrimide, Phenol, chloroxylenol, Formaldehyde solution, Hexachlophene, Nitrofurantoin.

Sulphonamides- Sulphadiazine, Sulphaguanidine, Phthalylsulphathaizole, Succinylsulphathiazole, Sulphadimethoxine, Sulphamethoxypyridazine, Co-trimoxazole, sulfacetamide*

Antileprotic Drugs- Clofazimine , Thiambutosine, Dapsone*, solapsone,

Anti-tubercular Drugs- Isoniazid*, PAS*, Streptomycin, Rifampicin, Ethambutol*, Thiacetazone, Ethionamide, cycloserine, pyrazinamide*.

Antimoebic and Anthelmintic Drugs- Emetine, Metronidazole, Halogenated hydroxyquinolines, Diloxanide furoate, Paromomycin , Piperazine*, Mebendazole ,D.E.C.*

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

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

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

Tranquilizers-Chlorpromazine*, Prochlorperazine, Trifluoperazine, Thiothixene, Haloperiodol*,Triperiodol, Oxypertine, Chlordizepoxide, Diazepam*, Lorazepam, Meprobamate.

Hypnotics- Phenobarbitone*, Butobarbitone, Cylobarbitone, Nitrazepam, Glutethimide*, Methyprylon, Paraldehyde, Triclofosodium.

General Anaesthetics-Halothane*, Cyclopropane*, Diethyl ether*, Methohexital sodium, Thiopecal sodium, Trichloroethylene .

Antidepressant Drugs- Amitriptyline, Nortryptyline, Imperamine*, Phepelzine, Tranylcypromine.

Analeptics- Theophylline, Caffeine*, Coramine*, Dextro-amphetamine.

Adrenergic drugs- Adrenaline*, Noradrenaline, Isoprenaline*, Phenylephrine, Salbutamol, Terbutaline, Ephedrne*, Pseudoephedrine.

Adrenergic antagonist- Tolazoline, Propranolol*, Practolol.

Cholinergic Drugs- Neostigmine*, Pyridostigmine, Pralidoxime, Pilocarpine, Physostigmine*.

Cholinergic Antagonists- Atropine*, Hyoscine, Homatropine, Propantheline*, Benztropine, Tropicamide, Biperiden*.

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

Cardiovascular Drugs- Ethylnitrite*, Glyceryl trinitrate, Alpha methyldopa, Guanethidine, Clofibrate, Quinidine.

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

Coagulants and Anti coagulants- Heparin, Thrombin, Menadione*, Bisphydroxy-coumarin, Warfarin sodium.

L**ocal Anaesthetics**- Lignocaine*, Procaine*, Benzocaine,

Histamine and anti Histaminic Agents- Histamine, Diphenhydramine*, Promethazine, Cyproheptadine, Mepyramine*, Pheniramine, Chlorpheniramine*,

Analgesics and Anti-pyretics-Morphine, Pethidine, Codeine, Mathadone, Aspirin*, Paracetamol, Analgin, Dextropropoxphene, Pentazocine.

Non-steriodal anti-inflammatory agents- Indomethacin*, Phenylbutazone*, Oxyphenbutazone, Ibuprofen.

Thyroxine and Antithyroids- Thyroxine*, Methimazole, Methyl thiouracil, Propylthiouracil. Diagnostic Agents- Lopanoic Acid, Propyliodone, Sulfobromopthalein-sodium, Indigotindisulfonate, Indigo Carmine, Evans blue, Congo Red, Fluorescein sodium.

Anticonvulsants, cardiac glycosides, Antiarrhythmic, Antihypertensives & Vitamins.

Steroidal Drugs- Betamethasone, Cortisone, Hydrocortisone, Prednisolone, Progesterone, Testosterone, Oestradiol, Nandrolone.

Anti-Neoplastic Drugs- Actinomycin, Azathioprie, Busulphan, Chloramubucil, Cisplatin, Cyclophosphamide, Daunorubicin Hydrochoride, Fluorouracil, Mercaptopurine, Methotrexate, Mytomycin.

Note: (chemical structure of only those compounds marked with asterisk (*)

TEXTBOOK [TB]

1. Pharmaceutical Chemistry II for Second Year Diploma in Pharmacy Second Year3Ed (PB 2019). by Raje V. N
2. Text book of Pharmaceutical Organic Chemistry II for Second Year Diploma in Pharmacy Second Yearby Mohammed Ali.

REFERENCE BOOK [RB]

1. Pharmacopoeia of India.
2. British Pharmaceutical Codex.
3. Martindale- The Extra Pharmacopoeia

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date, Time & Venue
1.	Continuous mode	-	-	
2.	Sessional exams	**1 hr**	**20**	
3.	End-Term Examination	**3 hrs**	**80**	
4.				
		Total	**100**	

Teacher(s) Contact: Students can contact the Course Teacher(s) in his/her chamber for consultation in the hour specified.

Course Code	Course Title	L	T	P	S	C
DP203T	PHARMACOLOGY AND TOXICOLOGY	3	0	0	0	0

Course Teacher(s):

COURSE OBJECTIVES

Upon completion of this course the student should be able to

1. Understand the pharmacological actions of different categories of drugs
2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
4. Appreciate correlation of pharmacology with other bio medical science

Introduction to pharmacology, scope of pharmacology.

Routes of administration of drugs, their advantages and disadvantages. Various processes of absorption of drugs and the factors affecting them. Metabolism, distribution and excretion of drugs.

General mechanism of drugs action and their factors which modify drugs action. Pharmacological classification of drugs. The discussion of drugs should emphasize the following aspects:

Drugs acting on the central Nervous system:

General anaesthetics- adjunction to anaesthesia, intravenous anaesthetics.

Analgesic antipyretics and non-steroidal

Anti-inflammatory drugs- Narcotic analgesics.

Antirheumatic and anti-gout remedies.

Sedatives and Hypnotics, psychopharmacological agents, anticonvulsants, analeptics.

Centrally acting muscle relaxants and anti parkinsonism agents.

Local anesthetics.

Drugs acting on autonomic nervous system.

Cholinergic drugs, Anticholinergic drugs, anticholinesterase drugs.

Adrenergic drugs and adrenergic receptor blockers.

Neurone blockers and ganglion blockers.

Neuromuscular blockers, used in myasthenia gravis.

Drugs acting on eye: Mydriatics, drugs used in glaucoma.

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

Autocoids: physiological role of histamine and serotonin, Histamine and Antihistamines, prostaglandins.

Cardio vascular drugs: Cardiotonics, Antiarrhythmic agents, Anti-anginal agents, Antihypertensive agents, peripheral Vasodilators and drugs used in atherosclerosis.

Drugs acting on the blood and blood forming organs. Haematinics, coagulants and anticoagulants, Haemostatic , Blood substitutes and plasma expanders.

Drugs affecting renal function- Diuretics and anti-diuretics.

Hormones and hormone antagonists- Hypoglycemic agents, Anti--thyroid drugs, sex hormones and oral contraceptives , corticosteroids.

Drugs acting on digestive system-carminatives, digest ants, Bitters, Antacids and drugs used in peptic ulcer, purgatives ,and laxatives, Antidiarrohoeals, Emetics, Anti-emetics, Antispasmodics.

Chemotherapy of microbial diseases: Urinary antiseptics, sulphonamides, penicillin, streptomycin, Tetracyclines and other antibiotics. Anti-tubercular agents, Antifungal agents, antiviral drugs, anti-leprotic drugs.

Chemotherapy of protozoal diseases, Anthelmintic drugs.

Chemotherapy of cancer.

Disinfectants and antiseptics.

TEXTBOOK [TB]

1. K.D.Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd,

New Delhi.

REFERENCE BOOK [RB]

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology,.Churchil Livingstone Elsevier

2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date, Time & Venue
1.	**Continuous mode**	**-**	**-**	
2.	**Sessional exams**	**1 hr**	**20**	
3.	**End-Term Examination**	**3 hr**	**80**	
4.				
		Total	**100**	

Teacher(s) Contact: Students can contact the Course Teacher(s) in his/her chamber for consultation in the hour specified.

Course Code	Course Title	L	T	P	S	C
DP204T	**Pharmaceutical Jurisprudence Theory**	**2**	**0**	**0**	**0**	**0**

Course Teacher(s):

COURSE OBJECTIVES

This course will discuss about :

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

COURSE SYLLABUS

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.

Principles and significance of professional Ethics. Critical study of the code of pharmaceutical Ethics drafted by pharmacy council of India.

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.

The Drugs and Cosmetics Act, 1940-General study of the Drugs and cosmetics Act and the Rules there under. Definitions and salient features related to retail and whole sale distribution of drugs. The powers of Inspectors, the sampling procedures and the procedure and formalities in obtaining licenses under the rule. Facilities to be provided for running a pharmacy effectively. General study of the schedules with special reference to schedules C,C1,F,G,J,H,P and X and salient features of labeling and storage conditions of drugs.

The Drugs and Magic Remedies (objectionable Advertisement)Act, 1954-General study of the

Act, objectives , special reference to be laid on Advertisements, magic remedies and objections1 and permitted advertisements -diseases which cannot be claimed to be cured.

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

Brief introduction to the study of the following acts:
Latest Drugs (price control) order in force.

Poisons Act 1919(as amended to date)

Medicinal and Toilet preparations (excise Duties) Act, 1955 (as amended to date).

Medical Termination of Pregnancy Act, 1971(as amended to date).

TEXTBOOK [TB]

1. Forensic Pharmacy by B. Suresh
2. Text book of Forensic Pharmacy by B.M. Mithal
3. A text book of Forensic Pharmacy by N.K. Jain

REFERENCE BOOK [RB]

Bare Acts of the said laws published by Government.

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date,Time & Venue
1.	Continuous mode	-	-	
2.	Sessional exams	1hr	20	
3.	End-Term Examination	3 hrs	80	
4.				
Total			**100**	

Course Code	Course Title	L	T	P	S	C
DP205T	Drug Store And Business Management	3	0	0	0	0

Course Teacher(s):

COURSE OBJECTIVES

Upon completion of this course the student should be able to
1. To understand the concept and various parts of commerce
2. To understand basic concepts of accountancy

Part I Commerce (50 hours)

Introduction-Trade, Industry and commerce, Functions and subdivision of commerce, Introduction to Elements for Economics and Management. Forms of Business Organizations. Channels of Distribution.

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. 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.
Sales promotion, Market Research, Salesmanship, qualities of a salesman, Advertising and Window Display.
Recruitment, training, evaluation and compensation of the pharmacist.
Banking and Finance-Service and functions of bank, Finance planning and sources of finance.

Part II Accountancy (25 hours)

Introduction to the accounting concepts and conventions. Double entry Book Keeping, Different kinds of accounts. Cash Book. General Ledger and Trial Balance. Profit and Loss Account and Balance Sheet. Simple techniques of analyzing financial statements. Introduction to Budgeting.

TEXTBOOK [TB]

1. R. M. Mehta, Pharmaceutics-II, Vallabh Prakashan publishers, 2003, 286.
2. Carter S.J., Cooper and Gunn's-Dispensing for Pharmaceutical Students, CBS publishers, New Delhi.
3. M.E. Aulton, Pharmaceutics, The Science& Dosage Form Design, Churchill Livingstone, Edinburgh.
4. Lachmann. Theory and Practice of Industrial Pharmacy, Lea&Febiger Publisher, The University of Michigan.
5. Alfonso R. Gennaro Remington. The Science and Practice of Pharmacy, Lippincott Williams, New Delhi.
6. Carter S.J., Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.

REFERENCE BOOK [RB]

1. Remington's Pharmaceutical Sciences.
2. The Extra Pharmacopoeia-Martindale.

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date, Time & Venue
1.	Continuous mode	-	-	
2.	**Sessional exams**	**1hr**	**20**	
3.	**End-Term Examination**	**3 hr**	**80**	
Total			**100**	

Teacher(s) Contact: Students can contact the Course Teacher(s) in his/her chamber for consultation in the hour specified.

Course Code	Course Title	L	T	P	S	C
DP206T	Hospital and Clinical Pharmacy Theory	3	0	0	0	0

Course Teacher(s):

COURSE OBJECTIVES

This course will discuss about basic concepts of :

1. Learn about infection control measures, especially in the context of sterile compounding and healthcare-associated infections.
2. Learn how to monitor patients' response to medications through laboratory tests and clinical assessments.
3. Develop advocacy skills to ensure patients receive appropriate and affordable medications.
4. Learn how to assess patients' medical conditions and medication needs, considering factors like age, weight, allergies, and comorbidities.

COURSE SYLLABUS

Hospital-Definition, Function, classifications based on various criteria, organization, Management and health delivery system in India.

Hospital Pharmacy: Definition Functions and objectives of Hospital pharmaceutical services. Location, Layout, Flow chart of materials and men. Personnel and facilities requirements including equipments based on individual and basic needs. Requirements and abilities required for Hospital pharmacists.

Drug Distribution system in Hospitals. Out-patient service, In-patient services- types of services detailed discussion of unit Dose system, Floor ward stock system, satellite pharmacy services, central sterile services, Bed side pharmacy.

Manufacturing: Economical considerations, estimation of demand.

Sterile manufacture-Large and small volume parenterals, facilities, requirements, layout production planning , man-power requirements.

Non-sterile manufacture-Liquid orals, externals, Bulk concentrates. Procurement of stores and testing of raw materials.

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

P.T.C. (Pharmacy Therapeutic Committee)

Hospital Formulary system and their organization, functioning, composition.

Drug Information service and Drug Information Bulletin.

Surgical dressing like cotton, gauze, bandages and adhesive tapes including their pharmacopoeial tests for quality. Other hospital supply eg. I.V.sets, B.G. sets, Ryals tubes, Catheters, Syringes etc . **Application of computers** in maintenance of records, inventory control, medication monitoring, drug information and data storage and retrieval in hospital retail pharmacy establishment.

Introduction to Clinical pharmacy practice- Definition, scope.

Modern dispensing aspects- Pharmacists and patient counseling and advice for the use of common drugs, medication history.

Common daily terminology used in the practice of Medicine.

Disease, manifestation and patho-physiology including salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

Physiological parameters with their significance.

Drug Interactions: Definition and introduction. Mechanism of Drug Interaction. Drug-drug interaction with reference to analgesics, diuretics, cardiovascular drugs, Gastro-intestinal agents. Vitamins and Hypoglycemic agents. Drug-food interaction.

Adverse Drug Reaction: Definition and significance. Drug-Induced diseases and Teratogenicity.

Drugs in Clinical Toxicity- Introduction, general treatment of poisoning, systemic antidotes, Treatment of insecticide poisoning, heavy metal poison, Narcotic drugs, Barbiturate, Organo-phosphorus poisons.

Drug dependences, drug abuse, addictive drugs and their treatment, complications.

Bio-availability of drugs, including factors affecting it.

TEXTBOOK [TB]

1. P.C. Dandiya, Mukul Mathur, "Textbook of Hospital and Clinical Pharmacy" Vallabh Prakashan, 2018.

2. D.J. Patil, " A Textbook of Hospital and Clinical Pharmacy" Nirali Prakashan.

REFERENCE BOOK [RB]

1. Remington's pharmaceutical sciences.

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date,Time & Venue
1.	Continuous mode	-	-	
2.	Sessional exams	1hr	20	
3.	End-Term Examination	3 hrs	80	
4.				
Total			100	

Course Code	Course Title	L	T	P	S	C
DP207P	Pharmaceutics II Practical	0	0	4	0	0

Course Teacher(s):

COURSE OBJECTIVES

This course will discuss about basic concepts of :

1. History of profession of pharmacy

2. Different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations

3. Professional way of handling the prescription 4. Preparation of various conventional dosage forms

COURSE SYLLABUS

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

TEXTBOOK [TB]

1. R. M. Mehta, Pharmaceutics-II, Vallabh Prakashan publishers, 2003, 286.
2. Carter S.J., Cooper and Gunn's-Dispensing for Pharmaceutical Students, CBS publishers, New Delhi.
3. M.E. Aulton, Pharmaceutics, The Science& Dosage Form Design, Churchill Livingstone, Edinburgh.
4. Lachmann. Theory and Practice of Industrial Pharmacy, Lea&Febiger Publisher, The University of Michigan.
5. Alfonso R. Gennaro Remington. The Science and Practice of Pharmacy, Lippincott Williams, New Delhi.
6. Carter S.J., Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.

REFERENCE BOOK [RB]

1. Remington's Pharmaceutical Sciences.

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE(%)	Date,Time & Venue
1.	Continuous mode	-	-	
2.	Sessional exams	1 hr	20	
3.	End-Term Examination	3 hrs	80	
4.				
		Total	100	

Course Code	Course Title	L	T	P	S	C
DP208P	Pharmaceutical Chemistry Practical	0	0	3	0	0

Course Teacher(s):

COURSE OBJECTIVES

This course will discuss about basic concepts of :

1. This subject is designed to understand the chemistry and nomenclature of drugs
2. This subject is to understand the pharmacological activity of various drugs.
3. To study physical and chemical properties of pharmaceutical organic compounds.
4. Medicinal uses of various drugs.

COURSE SYLLABUS

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

TEXTBOOK [TB]

1. Organic chemistry by I.L. Finar, Volume-I & II.

2. A text book of organic chemistry – Arun Bahl, B.S. Bahl.

REFERENCE BOOK [RB]

1. Pharmacopoeia of India.

2. British Pharmaceutical codex.

3. Martindale's Extra pharmacopoeia.

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE(%)	Date,Time & Venue
1.	Continuous mode	-	-	
2.	Sessional exams	1hr	20	
3.	End-Term Examination	3 hrs	80	
4.				
Total			100	

Course Code	Course Title	L	T	P	S	C
DP209P	Pharmacology and Toxicology	0	0	2	0	0

Course Teacher(s):

COURSE OBJECTIVES

Upon completion of this course the student should be able to

1. Understand the pharmacological actions of different categories of drugs
2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
4. Appreciate correlation of pharmacology with other bio medical sciences

COURSE SYLLABUS

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 potassium and calcium ions, acetylcholine and adrenaline on frog's heart.
2. Effect of acetyl choline on rectus abdomens muscle of frog and guinea pig ileum.
3. Effect of spasmogens and relaxants on rabbits intestine.
4. Effect of local anaesthetics on rabbit cornea.
5. Effect of mydriatics and miotics on rabbit's 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 pyrogens.
11. Taming and hypnosis potentiating effect of chlorpromazine in mice/rats.
12. Effect of diphenhydramine in experimentally produced asthma in guinea pigs.

TEXTBOOK [TB]

2. K.D.Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.

REFERENCE BOOK [RB]

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology,.Churchil Livingstone Elsevier

2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date, Time & Venue
1.	Continuous mode	-	-	
2.	Sessional exams	1 hr	20	
3.	End-Term Examination	3 hrs	80	
4.				
Total			100	

Course Code	Course Title	L	T	P	S	C
DP210P	Hospital and Clinical Pharmacy (Practical)	0	0	2	0	0

Course Teacher(s):

COURSE OBJECTIVES

This course will discuss about basic concepts of :

1. Ability to analyze health problems, interpret data and arrive at meaningful conclusions involving scientific inferences
2. Ability to design drugs and drug delivery systems to meet desired needs considering public health and safety, and the cultural, societal, and environmental considerations 3
3. Ability to understand the effect of pharmaceutical solutions on legal, cultural, social and public health and safety aspects

COURSE SYLLABUS

1. Preparation of transfusion fluids.
2. Testing of raw materials used in (1).
3. Evaluation of surgical dressings.
4. Sterilization of surgical instruments, glassware and other hospital supplies.
5. Handling and use of data processing equipment.

TEXTBOOK [TB]

1. Martindale the Extra Pharmacopoeia.

REFERENCE BOOK [RB]

1. Remington's Pharmaceutical Sciences.

EVALUATION SCHEME

S.NO	EVALUATION COMPONENT	DURATION	WEIGHTAGE (%)	Date, Time & Venue
1.	**Continuous mode**	**-**	**-**	
2.	**Sessional exams**	**1 hrs**	**20**	
3.	**End-Term Examination**	**3 hrs**	**80**	
4.				
Total			**100**	