Scope, Course Objectives and Course Outcomes

I PharmD

HUMAN ANATOMY & PHYSIOLOGY - THEORY

Scope: Human Anatomy & Physiology course is designed to impart a fundamental knowledge on the structure and functions of the human body. It also helps in understanding both homeostasis mechanisms and homeostatic imbalances of various body systems. Since a medicament, which is produced by pharmacist, is used to correct the deviations in human body, it enhances the understanding of how the drugs act on the various body systems in correcting the disease state of the organs.

Objectives: The primary objectives of this course are to

1. Understand the structure and functions of various organs of the human body.
2. Learn the various homeostatic mechanisms and their imbalances of various systems.
3. Learn about various tissues and organs of the different systems of the human body.
4. Understand the principles of hematological tests, recording blood pressure, heart rate, pulse and Respiratory volumes.
5. Understand the coordinated working pattern of different organs of each system.
6. Understand the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Define the basic concepts in Human Anatomy & Physiology.

CO 2 : Apply concepts and knowledge of Human Anatomy & Physiology to clinical scenarios.

CO 3: Explain how the separate systems interact to yield integrated physiological responses.

CO 4: Link the physiology and pathophysiology of several diseases.

CO 5 : Critically interpret the common laboratory values in medicine.

CO 6 : Use scientific laboratory equipment in order to gather and analyze data on human anatomy and physiology.

HUMAN ANATOMY & PHYSIOLOGY - PRACTICAL

Scope: This course is designed to impart a fundamental knowledge on the structure and functions of the human body. It also helps in understanding both homeostasis mechanisms and homeostatic imbalances of various body systems. Since a medicament, which is produced by pharmacist, is used to correct the deviations in human body, it enhances the understanding of how the drugs act on the various body systems in correcting the disease state of the organs.

Objectives: The primary objectives of this course are to

1. Learn the various cells and tissues of different systems of human body.
2. Understand the gross morphology, structure and functions of bones and various organs of the human body.
3. Determining the abnormalities in the ranges of blood and physiological parameters through interpreting the normal values
4. Understand the anatomy & Physiology of various systems
5. Understand the role of different systems in maintenance of homeostasis

Course Outcomes (COs): At completion of this course, it is expected that the students will be able to

CO 1: Demonstrate the principle and working of various instruments used in HAP.

CO 2: Identify of microscopical features of various types of cells and tissues

CO 3: Identify gross anatomy and physiology of various bones.

CO 4: Perform hematological tests and also record BP, heart rate & pulse

CO 5: Appreciate coordinated working pattern of different organs of each system.

CO 6: Explain the physiology of skeletal muscle contraction

PHARMACEUTICS – THEORY

Scope: This course is designed to impart basic knowledge and skills at the fundamental level in pharmacy for certain basic formulation in the primitive stages. This course also provides detailed information on the prescription its handling, usage of different systems for weights and measures, calculation of doses for a child using different formulas. This course provides information on various liquid dosage forms, semisolid dosage forms that are in practice. This course also covers the extraction techniques which are used in the practice for extraction of valuable plant materials. Also, the course provides a detailed information on the incompatibility of the physical, chemical and therapeutic nature which gives a solution during the formulation and administration. The course also emphasizes on the surgical aids wherein the manufacture of surgical products is detailed in an elaborative manner for the students.

Objectives: The primary objectives of this course are to

1. Discuss the basic knowledge on the various formulations
2. Help the students to understand prescription and handling of the prescription.
3. Explain how to calculate the dose for child using various formulas.
4. Help the students to understand the different weighing and measuring systems followed in the field of pharmacy.
5. Equip the students to well verse in the different formulations such as solid, liquid and semisolid formulation.
6. Facilitating the students to apply theoretical knowledge into practical outcomes such as incompatibility.

Course Outcomes (COs): At completion of this course it is expected that students will be able to

CO 1 : Understand the basic knowledge on the various formulation's aspects.

CO 2 : Understand the parts of prescription and handling of prescription.

CO 3 : To get familiar with the dose calculation using different formulas.

CO 4 : Familiar with the different weighing and measuring system followed in the field of pharmacy.

CO 5 : Formulate the different dosage forms such as solid and liquid orals.

CO 6 : Use of practical knowledge in the field of incompatibility and method to overcome.

PHARMACEUTICS – PRACTICAL

Scope: This course is designed to impart basic knowledge and skills at the fundamental level in pharmacy for certain basic formulation in the primitive stages. This course provides information on various liquid dosage forms, semisolid dosage forms that are in practice. Also, the course provides detailed information on the incompatibility of the physical, chemical and therapeutic nature which gives a solution during the formulation and administration.

Objectives: The primary objectives of this course are to

1. Discuss the basic knowledge on the various formulations
2. Equip the students to well verse in the different formulations such as solid, liquid and semisolid formulation.
3. Facilitating the students to apply theoretical knowledge into practical outcomes such as incompatibility.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Understanding the basic knowledge in the formulation aspects of different dosage forms.

CO 2 : Formulate the different dosage forms such as solid and liquid orals.

CO 3: Use of practical knowledge in the field of incompatibility and method to overcome.

MEDICINAL BIOCHEMISTRY - THEORY

Scope: Medicinal Biochemistry subject is designed with complete understanding of the molecular level of the chemical process associated with living cells in normal and abnormal state. Clinical chemistry deals with the study of chemical aspects of human life in health and illness and the application of chemical laboratory methods to diagnosis, control of treatment and prevention of diseases.

Objectives: The primary objectives of this course are to

1. Provide the biochemical facts and the principles to the students of pharmacy.
2. Understand the catalytic activity of enzymes and importance of enzymes in diagnosis of diseases and therapeutic agents.
3. Know the metabolic pathways of biomolecules in health and illness (metabolic disorders).
4. Understand the genetic organization of mammalian genome, protein synthesis, replication, mutation and repair mechanism.
5. Know the biochemical principles of organ function tests of kidney, liver and endocrine gland do the qualitative analysis and determination of biomolecules in the body fluids and their clinical significance.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Define the basic concepts in medicinal biochemistry and clinical chemistry.

CO 2: Apply concepts and knowledge of medicinal biochemistry to clinical scenarios.

CO 3: Critically interpret how the biomolecules acts on the body and its mechanisms.

CO 4: Link the biochemical reactions and pathways of several diseases.

CO 5: Explain the common laboratory values in clinical chemistry.

CO 6: Use the scientific laboratory equipment in order to gather and analyze data on medicinal biochemistry.

MEDICINAL BIOCHEMISTRY - PRACTICAL

Scope: Medicinal Biochemistry deals with complete understanding of the molecular level of the chemical process associated with living cells in normal and abnormal state. Clinical chemistry deals with the study of chemical aspects of human life in health and illness and the application of chemical laboratory methods to diagnosis, control of treatment and prevention of diseases. The objective of the present course is providing biochemical facts and the principles to the students of pharmacy.

Objectives: The primary objectives of this course are

1. To find and distinguish the biomolecule carbohydrates.
2. To identify and detect the biomolecule proteins and amino acids.
3. To identify and detect the biomolecule lipids.
4. To analyze and determine the normal constituents of urine and blood.
5. To analyze and determine the abnormal constituents of urine and blood.
6. To understand the catalytic activity of enzymes and importance of enzymes in diagnosis of diseases and therapeutic agents.

Course Outcomes (COs): At completion of Medicinal Biochemistry Practical, students will be able to

CO 1: Identify the carbohydrates samples by qualitative analysis.
CO 2: Identify the proteins and amino acids samples by qualitative analysis.
CO 3: Identify the lipids samples by qualitative analysis.
CO 4: Analyze, determine and estimate normal and abnormal constituents of urine sample.
CO 5: Analyze, determine and estimate normal and abnormal constituents of blood sample.
CO 6: Study of the enzymatic hydrolysis and factors affecting enzyme activity.

PHARMACEUTICAL ORGANIC CHEMISTRY - THEORY

Scope: This course is designed to impart knowledge and skills necessary for nomenclature of simple organic compounds, physical properties and reactions with various mechanisms of organic compounds. Basic theoretical discussions of the principles of organic chemistry are provided to help the students to clarify the concepts.

Objectives: The primary objectives of this course are to impart a very good knowledge about

1. IUPAC/Common systems of nomenclature of simple organic compounds belonging to different classes of organic compounds
2. Some important physical properties of organic compounds
3. Free radical/ nucleophylic [alkyl/ acyl/ aryl] /electrophylic- substitution, free radical/ nucleophylic / electrophylic- addition, elimination, oxidation and reduction reactions with mechanism, orientation, order of reactivity, stability of compounds
4. Some named organic reactions with mechanisms
5. Uses of organic compounds in pharmacy.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Naming of simple organic compounds belonging to different classes of organic compounds

CO 2 : Know about the Physical properties of organic compounds

CO 3 : Know about various reactions with mechanism, orientation, order of reactivity, stability of organic compounds

CO 4 : Know about named organic reactions with mechanisms

CO 5 : Various uses of organic compounds in pharmacy

PHARMACEUTICAL ORGANIC CHEMISTRY - PRACTICAL

Objectives: The primary objectives of this course are to learn

1. IUPAC/Common systems of nomenclature of simple organic compounds belonging to different classes of organic compounds and make 3D-Structural model to learn easily.
2. Some important physical properties like m.pt, b.pt, solubility etc of organic compounds.
3. Various reactions with mechanism such as Free radical/ nucleophylic/ electrophylic-substitution, free radical/ nucleophylic / electrophylic- addition, elimination, oxidation and reduction and synthesis of organic compounds
4. Some named organic reactions with mechanisms and synthesis.
5. Uses of organic compounds in pharmacy
6. Systemic qualitative analysis of organic compounds.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Nomenclature of simple organic compounds in different classes and make 3D-Stereomodels to learn easily.

CO 2 : Determination of some important physical properties like m.pt, b.pt, solubility etc

CO 3 : Purification of Organic compounds

CO 4: Synthesis of organic compounds and study about principles, reactions and mechanism.

CO 5 : Synthesis of organic compounds with named reactions and study about mechanisms.

CO 6 : Systemic qualitative analysis of some unknown organic compounds

PHARMACEUTICAL INORGANIC CHEMISTRY – THEORY

Scope: This course is designed to impart basic knowledge about principles and procedures involved in analysis of various inorganic pharmaceuticals regarding their monographs and also deal with fundamentals of analytical chemistry.

Objectives: The primary objectives of this course are to

1. To provide knowledge about important inorganic pharmaceuticals in pharmacopoeia regarding their preparation, quality standard and pharmaceutical uses.
2. Help the students to understand the concepts of various analytical methods like acid-base, Redox, complexometry, non-aqueous and gravimetry.
3. To discuss various therapeutic classes of inorganic agents.
4. Describe acids, bases, buffers, water and different GIT agents.
5. Describe the major intra and extra cellular electrolytes, essential and trace elements, cationic and anionic components of inorganic drugs.
6. Familiarize with the principles of limit tests, different classes of inorganic pharmaceuticals and their analysis.
7. Explain topical agents, antacids, gases and vapours, dental products, pharmaceuticals aid and radio pharmaceuticals.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Understand the principles and procedures for analysis of inorganic pharmaceuticals their applications

CO 2: Explain different pharmaceutical buffers, their preparations and uses in pharmaceutical system

CO 3: Understand the medicinal importance of inorganic pharmaceuticals

CO 4: Having basic knowledge about various impurities in pharmaceuticals and also principles and methods of limit tests to control common impurities in pharmaceutical substances.

CO 5: To highlight the domain of radiopharmaceuticals used in the diagnostics and therapy

PHARMACEUTICAL INORGANIC CHEMISTRY – PRACTICAL

Scope: This course is designed to impart knowledge and skills on the fundamentals of analytical chemistry and also the study the monographs of some inorganic compounds. The course also deals with basic knowledge of analysis of various inorganic pharmaceuticals.

Objectives: The primary objectives of this course are to

1. To understand principles of qualitative and limit tests of inorganic pharmaceuticals
2. To discuss the principles and methodology of assay of several inorganic drugs.
3. To perform volumetric analysis of some important inorganic compounds.
4. To perform the identification tests for different inorganic anions and cations.
5. To equip the students to prepare some important inorganic pharmaceuticals

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Be familiar with different classes of inorganic pharmaceuticals and acquire knowledge about the sources of impurities and methods to determine the impurities in pharmaceuticals

CO 2 : Understand the medicinal importance of pharmaceutical inorganic compounds and their analysis.

CO 3 : Acquire knowledge and skills on volumetric analytical methodologies.

CO 4 : Knowledge identify/confirm the unknown inorganic anions and cations.

CO 5 : Acquire basic knowledge regarding general methods of preparation of inorganic compounds of pharmaceutical importance.

REMEDIAL MATHEMATICS

Scope: This course is designed to impart knowledge and skills necessary for introduction to mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform.

Objectives: The primary objectives of this course are to enable students to

1. Know the theory and their application of mathematics in Pharmacy.
2. Solve the different types of problems by applying theory.
3. Appreciate the important application of mathematics in Pharmacy.
4. Perform abstract mathematical reasoning

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.

CO 2 : Create, use and analyze mathematical representations and mathematical relationships

CO 3 : Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy

REMEDIAL BIOLOGY – THEORY

Scope: To learn and understand the components of living world, structure and functional system of plant and animal kingdom.

Objectives: The primary objectives of this course are to

1. Know the classification and salient features of five kingdoms of life
2. Understand the basic components of anatomy & physiology of plant
3. Understand the basic components of anatomy & physiology of animal with special reference to human

Course Outcomes (COs): On successful completion of the subject the student shall be able to

CO 1: Know about the kingdoms of plants, basic concepts and components of animal with reference to human and know about the basic concept, history and background with pharmacognosy

CO 2: Recognize about the different cell inclusions, cell wall components and some secondary metabolite

CO 3: Recognize the different cell inclusions, cell wall components and some secondary metabolites

CO 4: To know about the anatomy and physiology of animals in reference to human beings

REMEDIAL BIOLOGY – PRACTICAL

Scope: To learn and understand the components of living world, structure and functional system of plant and animal kingdom.

Objectives: The primary objectives of this course are to

1. Know the classification and salient features of five kingdoms of life
2. Understand the basic components of anatomy & physiology of plant
3. Understand the basic components of anatomy & physiology of animal with special reference to human

Course Outcomes (COs): On successful completion of the subject the student shall be able to

CO 1: Know about the kingdoms of plants, basic concepts and components of animal with reference to human and know about the basic concept, history and background with pharmacognosy

CO 2: Recognize about the different cell inclusions, cell wall components and some secondary metabolite

CO 3: To know anatomy and physiology of animals in reference to human beings

CO 4: Distinguish about the different methods of adulteration of crude drugs

CO 5: Perform hematological tests and also record BP, heart rate & pulse

II PharmD

PATHOPHYSIOLOGY – THEORY

Scope: This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic Pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge of its application in other subject of pharmacy.

Objectives: The primary objectives of this course are to:

1. Apply principles of normal anatomy and physiology of human body systems to the pathophysiologic processes of common health problems.
2. Identify concepts, principles, and responses related to pathophysiologic processes that result in disease.
3. Discuss clinical manifestations of selected disease processes and health problems

Course Outcomes (COs): At completion of this course it is expected that the students will be able to:

CO 1. Describe the etiology and pathogenesis of the selected disease states
CO 2. Demonstrate a basic understanding of the concepts and elements of disease
CO 3. Name the signs and symptoms of the diseases
CO 4. Mention the complications of the diseases
CO5. Distinguish environmental factors, physical, psychosocial, and cognitive characteristics of various diseases and conditions.
CO 6. Identify implications of therapeutic interventions for diseases and conditions.
CO 7. Discuss common laboratory and diagnostic tests

MICROBIOLOGY - THEORY

Scope: Microbiology has always been an essential component of pharmacy curriculum. This is because of the relevance of microbiology to pharmaceutical sciences and more specifically to pharmaceutical industry. This course deals with the various aspects of microorganisms, its classification, morphology, laboratory cultivation identification and maintenance. It's also discusses with sterilization of pharmaceutical products, equipment, media etc. The course further discusses the immunological preparations, diseases its transmission, diagnosis, control and immunological tests.

Objectives: The objectives of this course are to:

1. know the anatomy, identification, growth factors and sterilization of microorganisms
2. know the mode of transmission of disease-causing microorganism, symptoms of disease, and treatment aspect
3. appreciate the behavior of motility and behavioral characteristics of microorganisms
4. estimate RNA and DNA and there by identifying the source
5. do cultivation and identification of the microorganisms in the laboratory
6. identify the diseases by performing the diagnostic tests

Course Outcomes (COs): At completion of this course, it is expected that the students will be able to:

CO 1: understand the world of microbiology, identify the microorganism based on the morphology & structure and growth and
nutritional requirements of the organism
CO 2: identify the microorganism based on staining techniques and biochemical reactions
CO 3: recognize the importance of sterilization and disinfectants process and aseptic conditions
CO 4: realize the role of immune system in keep individual healthy and identify the disease by performing various diagnostic tests
CO 5: describe how the microorganisms play a key role in assay of vitamins and antibiotics
CO 6: describe various diseases – etiology, pathology, diagnosis and treatment

MICROBIOLOGY – PRACTICAL

Scope: This practical is designed to impart knowledge and skills necessary for the understanding of various aspects in microbiology such as aseptic techniques, sterilization etc. Study of various apparatus used in experimental microbiology. The components of the subject help the student to get a better insight into various areas of isolation& purification of microbes, biological assay of antibiotics, and assessment of microbiological instruments.

Objectives: The primary objectives of this course are to

1. Study the apparatus their usage and application in experimental microbiology
2. Study and practically apply the importance of aseptic techniques while handling materials in microbiological laboratory
3. Understand methods used in isolation and purification of single organism from mixed environment
4. Know the morphological and cultural characters of microbes & to use them in identifying specific bacteria and fungi
5. Help the students to understand the various culture medias and their usage in different microbial species
6. Equip the students in Diagnostic tests for some common diseases.
7. Appreciate the importance of industrially important microorganisms
8. Demonstrate use of physical, chemical and biological methods of controlling microorganism

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO1: Know microorganism growth multiplication and their industrial usage.

CO2: Able to identify specific organism by using morphological, cultural and biochemical test

CO3: To validate the efficiency of sterilization techniques and disinfection procedures

CO4: To make the environment free of microorganism by aseptic techniques

CO5: Critically interpret all the assessment methods to validate the disinfection and sterilization

PHARMACOGNOSY - THEORY

Scope: This subject have been introduced for the pharmacy course in order to make the student aware of medicinal uses of various naturally occurring drugs, their history, sources, distribution, method of cultivation, active constituents present, medicinal uses, identification tests, preservation methods, substitutes and adulterants.

Objectives:

1. To know and understand the fundamentals of natural drugs and their sources
2. To understand the various cultivation techniques and the extraction methods
3. To understand the structure of different phytoconstituents and their action
4. To carry out the identification of various phytoconstituents by chemical tests
5. To understand the histological arrangements of various drugs
6. To study about the sutures and ligatures used in surgical procedures

Course Outcomes (COs): At completion of this course, it is expected that the students will be able to:

CO1: Understand the basic principles of cultivation, collection, extraction, identification and storage of crude drugs
CO2: Know the source, active constituents and uses of crude drugs and their adulterants
CO3: Understand the evaluation characteristics of plant drugs

PHARMACOGNOSY- PRACTICAL

Scope: This course is designed to impart knowledge and skills necessary for the students to know and understand about the medicinal uses of various naturally occurring drugs, their source, distribution, active constituents present in them, their medicinal uses, identification tests and evaluation methods.

Objectives: The primary objectives of this course are to
1. Discuss the fundamentals of Pharmacognosy and phytopharmaceuticals
2. Understand the macroscopical, microscopical and powdered characteristics of drugs of natural origin.
3. Help students to understand the chemical tests to be carried out for the identification of drugs.
4. Understand the different evaluation methods for the identification of adulterants and also to know the purity of the drugs.

Course Outcomes (COs): At the end of this course, the students will be able to
CO 1 : Understand the Pharmacognosy laboratory and experiments
CO 2 : Carry out the transverse section of plant parts to understand the arrangement of cells and tissues
CO 3 : Compare the tissue system and to understand the purity of the drugs
CO 4 : Carry out the chemical tests to determine the purity of drugs and to understand the nature of chemical constituents present
CO 5 : Know the different evaluation methods for the drugs

PHARMACOLOGY - THEORY

Scope: This subject will provide an opportunity for the student to learn about the drug with regard to classification, pharmacodynamic and pharmacokinetic aspects, adverse effects, uses, dose, route of administration, precautions, contraindications and interaction with other drugs. In this subject, apart from general pharmacology, drugs acting on autonomic nervous system, cardiovascular system, central nervous system, blood and blood forming agents and renal system will be taught.

Objectives: The primary objectives of this course are to

1. Understand the general pharmacological concepts
2. Learn the drugs acting on various physiological systems in the human body
3. Appreciate the importance of pharmacology subject as a basis of therapeutics
4. Know to correlate and apply the pharmacological knowledge therapeutically

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Define the basic terms of Medical Pharmacology
CO 2 : Select the appropriate dose and routes for drugs administration
CO 3 : Describe the pattern of absorption, distribution, metabolism and excretion of various drugs
CO 4 : Classify the drugs based on the mechanism of action and indications
CO 5 : Identify the types of adverse drug reactions, drug-drug interactions, food-drug interactions and contraindications
CO 6 : Apply the pharmacological knowledge in therapeutic aspects

COMMUNITY PHARMACY - THEORY

Scope: In the changing scenario of pharmacy practice in India, Community Pharmacists are expected to offer various pharmaceutical care services. In order to meet this demand, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counseling, health screening services for improved patient care in the community set up.

Objectives: The primary objectives of this course are to:

1. Know pharmaceutical care services
2. Know the business and professional practice management skills in community pharmacies
3. Do patient counseling & provide health screening services to public in community pharmacy
4. Respond to minor ailments and provide appropriate medication
5. Show empathy and sympathy to patients
6. Appreciate the concept of Rational drug therapy

Course Outcomes (COs): At the completion of this course it is expected that the students will be able to:

CO 1 : Provide patient-centered care to diverse patients using the best available evidence.

CO 2 : Educate patients through counseling and provide health screening services in public.

CO 3 : Identify symptoms of minor ailments and provide appropriate medication.

CO 4 : Exhibit code of ethics and ensure rational use of drugs in practice.

CO 5 : Participate in prevention programs of communicable diseases.

CO 6 : Demonstrate knowledge of the entrepreneurial and management skills in community pharmacies.

PHARMACOTHERAPEUTICS I - THEORY

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are to:

1. The pathophysiology of selected disease states and the rationale for drug therapy
2. The therapeutic approach to management of these diseases
3. The importance of preparation of individualized therapeutic plans based on diagnosis
4. Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)
5. Summarized the therapeutic approach to management of these diseases including reference to the latest available evidence
6. Discuss the controversies in drug therapy

Course Outcomes (COs): At completion of this course it is expected that the students will be able to:

CO 1: Describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases

CO 2: Develop the patient case-based assessment Skills

CO 3: Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases

CO 4: Develop clinical skills in the therapeutic management of these conditions

CO 5: Continue to develop communication skills.

CO 6: Students will provide patient – centered care to diverse patients using the evidence-based medicine

PHARMACOTHERAPEUTICS I - PRACTICAL

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are to:

1. The pathophysiology of selected disease states and the rationale for drug therapy
2. The therapeutic approach to management of these diseases
3. The importance of preparation of individualized therapeutic plans based on diagnosis
4. Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)
5. Summarized the therapeutic approach to management of these diseases including reference to the latest available evidence
6. Discuss the controversies in drug therapy

Course Outcomes (COs): At completion of this course it is expected that the students will be able to:

CO 1: Describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases

CO 2: Develop the patient case-based assessment Skills

CO 3: Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases

CO 4: Develop clinical skills in the therapeutic management of these conditions

CO 5: Continue to develop communication skills.

CO 6: Students will provide patient – centered care to diverse patients using the evidence-based medicine

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PHARMACOLOGY II (THEORY)

Scope: Pharmacology II provides an opportunity for the students to learn about different classes of drugs with regard to classification, pharmacodynamic and pharmacokinetic aspects, adverse effects, uses, dose, and route of administration, precautions, contraindications and interaction with other drugs.

Objectives: The primary objectives of this course are to

1. Understand the pharmacological aspects of drugs acting on the renal system, the GI system, the blood and the immune system.

2. Discuss the pharmacological aspects of chemotherapeutic drugs.

3. Explain the basics of molecular biology.

4. Appreciate the importance of pharmacology subject as a basis of therapeutics.

5. Enable the students to apply theoretical knowledge into clinical practice.

6. Design & execution of animal experiments to identify the pharmacological properties.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Identify and explain the pharmacodynamics and pharmacokinetic properties of drugs of various categories

CO 2: Recognize the adverse effects of drugs

CO 3: Avoid adverse drug reactions

CO 4: Recognize indications of different drugs and avoid contraindications

CO 5: Provide vital information to patients about drugs during patient counseling

CO 6: Design & execute animal experiments to identify the pharmacological properties of known drugs and unknown samples.

PHARMACOLOGY II (PRACTICAL)

Scope: Pharmacology II provides an opportunity for the students to learn about different classes of drugs with regard to classification, pharmacodynamics and pharmacokinetic aspects, adverse effects, uses, dose, route of administration, precautions, contraindications and interaction with other drugs.

Objectives: The primary objectives of this course are to

1. Understand the pharmacological aspects of drugs acting on the renal system, the GI system, the blood and the immune system.

2. Discuss the pharmacological aspects of chemotherapeutic drugs.

3. Explain the basics of molecular biology.

4. Appreciate the importance of pharmacology subject as a basis of therapeutics.

5. Enable the students to apply theoretical knowledge into clinical practice.

6. Design & execution of animal experiments to identify the pharmacological properties.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Define the basic concepts of experimental pharmacology.

CO 2: Identify the commonly used laboratory animals and apparatus in pharmacology

CO 3: Calculate the dose and decide the route of administration of drugs.

CO 4: Design experiments to test the safety and efficacy of experimental drugs

CO 5: Design and execute a bioassay to determine the potency of experimental drugs.

PHARMACEUTICAL ANALYSIS (THEORY)

Scope: This course is designed to impart a fundamental knowledge on the art and science of testing drugs by various instrumental methods of analysis. This focuses on various modern instruments that are used for testing the purity of drugs in various dosage forms. This course also gives idea about modern instruments that are used for drug testing like NMR, IR, Mass, HPLC, HPTLC forms. etc., It prepares the students for most basics of the applied field of pharmacy.

Objectives: The primary objectives of this course are to

1. To understand the principle, construction and working of various analytical instruments
2. Help the students to understand the concepts of pharmaceutical analysis
3. Discuss the fundamentals of Instrumentation Techniques like Chromatography and spectroscopy
4. Equip the students to analyse the drug or drugs by using different analytical instruments.
5. The students will learn the importance of Quality assurance in the pharma field.
6. The students also learn the importance of Calibration and validation to be performed for the instruments.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : The importance of Quality in Pharmaceuticals.
CO 2 : The students will gain appropriate knowledge about appropriate analytical skills required for the analysis of API and formulations.
CO 3 : To understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical instruments
CO 4 : To develop basic practical skills using instrumentation techniques parameters

PHARMACEUTICAL ANALYSIS (PRACTICAL)

Scope: This course is designed to impart a fundamental knowledge on the art and science of testing drugs by various instrumental methods of analysis.

Objectives:

This focuses on various modern instruments that are

1. used for testing the purity of drugs in various dosage forms
2. used for drug testing like NMR, IR, Mass, HPLC, HPTLC forms. etc,

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: To understand the construction and working of various analytical instruments
CO 2: To know principle and mechanism of instrumentation
CO 3: To understand the different modern techniques of drug analysis.
CO 4: To appreciate the advantages of instrumental methods of drug analysis.

PHARMACOTHERAPEUTICS-II (THEORY)

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are to

1. Know the pathophysiology of selected disease states and the rationale for drug therapy
2. Know the therapeutic approach to management of these diseases
3. Know the controversies in drug therapy
4. Know the importance of preparation of individualized therapeutic plans based on diagnosis
5. Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO1: Students will be able to describe the pathophysiology and management of infectious, cancer, renal failure and diseases
CO2: Students will be developing Patient case based Assessment Skills
CO3: Students will be able to describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of diseases
CO4**:** Students will have developed clinical skills in the therapeutic management of these conditions.
CO5: Continue to develop communication skills.
CO6: Students will provide patient – centered care to diverse patients using the evidence based medicine

PHARMACOTHERAPEUTICS-II (PRACTICAL)

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are

1. To obtain, interpret and evaluate patient information to determine the presence of a disease or medical condition; assess the need for treatment or referral; and identify patient-specific factors that affect health, pharmacotherapy, or disease management.

2. To use patient information and drug-related data, analyze and evaluate the appropriateness of a patient's current drug therapy (prescription and nonprescription) including dosing regimens, dosage forms, routes of administration, and delivery systems.

3. To develop a complete medical and drug therapy problem list.

4. To select and recommend appropriate drug (prescription and nonprescription) and non-drug therapy as part of a patient-specific care plan.

5. To design, implement, and manage a patient monitoring plan to ensure achievement of desired therapeutic outcomes.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Writing the SOAP Note (Subjective, Objective, Assessment, Plan) for the given case.

CO 2 : Preparing Treatment Chart Review to ensure the appropriateness of medication orders.

CO 3 : Applying the Pharmacotherapeutic Treatment Guideline and its related knowledge to evaluate the health outcomes of treatment plan and services.

CO 4 : Critically evaluating and identifying the Drug Related Problems/ Adverse Drug Reactions and making appropriate therapeutic interventions.

CO 5 : Providing systematic Patient Education to the patient/caregivers on drug, disease and lifestyle related information's.

PHARMACEUTICAL JURISPRUDENCE (THEORY)

Scope: This course exposes the student to several important legislations related to the profession of pharmacy in India. The Drugs and Cosmetics Act, along with its amendments is the core of this course. Other acts, which are covered, include the Pharmacy Act, dangerous drugs, medicinal and toilet preparation Act etc. Besides this the new drug policy, professional ethics, DPCO, patent and design Act will be discussed.

Course Objectives: The primary objectives of this course are to

1. Discuss the various concept of the pharmaceutical legislation in India
2. Help the students to understand the parameters involved in the Drugs and Cosmetics Act and rules
3. Discuss and understand the professional ethics
4. Familiarize the concept of Drug Policy, Drug Price Control Order, Patent and Design Act, Drugs and Magic Remedies Act
5. Help the students to understand the concepts of Narcotics and Psychotropic substances Act, Pharmacy Act and Excise duties Act
6. Equip the students to prepare label and packaging for any given drug using the guidelines under Drug and Cosmetics Act.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Define the concepts of the pharmaceutical legislation in India

CO 2: Practice the professional ethics in pharmacy field and ethics involved in Prevention of Cruelty to animals

CO 3: Define the concepts of Drug Policy, Drug Price Control Order, Patent and Design Act, Drugs and Magic Remedies Act

CO 4: Critically interpret the various schedules involved the Drugs and Cosmetics Act, Narcotics and Psychotropic Substances Act

CO 5: Apply the basic concepts of labeling and packaging of drugs

CO 6: Define the concepts of Pharmacy Act, Medicinal and Toilet Preparation Act

MEDICINAL CHEMISTRY (THEORY)

Scope: This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

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

1. Understand the chemistry of drugs with respect to their pharmacological activity
2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
3. Know the Structural Activity Relationship (SAR) of different class of drugs
4. Write the chemical synthesis of some drugs

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Helps in correlating between pharmacology of a disease and its mitigation or cure.
CO 2: To understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
CO 3: To know the structural activity relationship of different class of drugs.
CO 4: Well acquainted with the synthesis of some important class of drugs.
CO 5: Knowledge about the mechanism pathways of different class of medicinal compounds.
CO 6: To understand the chemistry of drugs with respect to their pharmacological activity.

MEDICINAL CHEMISTRY (PRACTICAL)

Scope: This course is designed to impart knowledge and skills necessary for nomenclature of simple organic compounds, physical properties and reactions with variousmechanismsoforganiccompounds.Basicprinciplesoforganicchemistry and apply practically are provided to help the students to clarify the concepts.

Objectives: The primary objectives of this course are to learn

1. IUPAC/Common systems of nomenclature of simple organic compounds belonging to different classesoforganiccompoundsandmake3D-Structural model to learn easily.
2. Some important physical properties like m.pt, b.pt, solubility etc of organic compounds.
3. Various reactions with mechanism such as Free radical/ nucleophylic/electrophylic-substitution, free radical /nucleophylic/ electrophylic-addition,elimination,oxidationandreductionandsynthesis of organic compounds
4. Some named organic reactions with mechanisms and synthesis.
5. Uses of organic compounds in pharmacy
6. Systemic qualitative analysis of organic compounds.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO1:Nomenclatureofsimpleorganiccompoundsindifferentclassesandmake3D-Stereomodels to learn easily.

CO 2: Determination of some important physical properties like m.pt, b.pt, solubility, etc

CO 3: Purification of Organic compounds

CO 4: Synthesis of organic compounds and study about principles, reactions and mechanism.

CO 5: Synthesis of organic compounds with named reactions and study about mechanisms.

CO6: Systemic qualitative analysis of some unknown organic compounds

PHARMACEUTICAL FORMULATIONS (THEORY)

Scope: This course is designed to impart knowledge about pharmaceutical dosage forms. It also deals with the formulation and evaluation of various pharmaceutical dosage forms

Objectives: The primary objectives of this course are to

1. Gain knowledge on the form in which the drugs are available in the market
2. Reasons/Necessary to convert into a dosage form
3. To acquire knowledge on formulation of conventional drug delivery system
4. To acquire knowledge on Novel drug delivery system

Course Outcomes (COs):

Upon completion of the subject student shall be able to (Know, do, appreciate) –

CO1: Understand the principle involved in formulation of various pharmaceutical dosage forms;
CO2: Prepare various pharmaceutical formulations
CO3: Perform evaluation of pharmaceutical dosage forms; and
CO4: Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations

PHARMACEUTICAL FORMULATIONS (PRACTICAL)

Scope: This course is designed to impart knowledge about pharmaceutical dosage forms. It also deals with the formulation and evaluation of various pharmaceutical dosage forms

Objectives: The primary objectives of this course are to

1. Gain knowledge on the form in which the drugs available in the market
2. Reasons/Necessary to convert into a dosage form
3. To acquire knowledge on formulation of conventional drug delivery system
4. To acquire knowledge on Cosmetic preparations
5. To enrich the knowledge for pharmaceutical instruments

Course Outcomes (COs): Upon completion of the subject student shall be able to (Know, do, appreciate) –

CO1: Understand the principle involved in formulation of various pharmaceutical dosage forms;
CO2: Understand the practical aspects of various formulations including the cosmetics.
CO3: Perform evaluation of pharmaceutical dosage forms; and
CO4: Understand and appreciate the various calculations related to dosage forms/formulation development
CO5: Understand the chose the right equipment for various dosage forms

IV PharmD

PHARMACOTHERAPEUTICS III - THEORY

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are to

1. The pathophysiology of selected disease states and the rationale for drug therapy
2. The therapeutic approach to management of these diseases
3. The importance of preparation of individualized therapeutic plans based on diagnosis
4. Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)
5. Summarize the therapeutic approach to management of these diseases including reference to the latest available evidence
6. Discuss the controversies in drug therapy

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Describe the pathophysiology and management of diseases

CO 2: Develop the patient case based assessment Skills

CO 3: Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases

CO 4: Develop clinical skills in the therapeutic management of these conditions

CO 5: Continue to develop communication skills.

CO 6: Students will provide patient – centered care to diverse patients using the evidence based medicine

PHARMACOTHERAPEUTICS III - PRACTICAL

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are to

1. The pathophysiology of selected disease states and the rationale for drug therapy
2. The therapeutic approach to management of these diseases
3. The importance of preparation of individualized therapeutic plans based on diagnosis
4. Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects)
5. Summarize the therapeutic approach to management of these diseases including reference to the latest available evidence and to Discuss the controversies in drug therapy

Course Outcomes (COs): At completion of this course it is expected that the students will be able to:

CO 1: Describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases

CO 2: Develop the patient case-based assessment Skills

CO 3: Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of diseases

CO 4: Develop clinical skills in the therapeutic management of these conditions

CO 5: Continue to develop communication skills.

CO 6: Students will provide patient – centered care to diverse patients using the evidence-based medicine

HOSPITAL PHARMACY - THEORY

Scope: This course is designed to impart knowledge and skills necessary for maintaining the Hospital pharmacy and how to become a responsible hospital pharmacist. This course provides an in-depth understanding for the student regarding the various committees regulating the hospital pharmacy, preparation of budget, procurement and warehousing of drugs and pharmaceuticals, handling of radio pharmaceuticals which helps the students to clarify the theoretical understanding when they face real world scenario as hospital pharmacists.

Objectives: The primary objectives of this course are to

1. Discuss the fundamentals of hospital setup and hospital pharmacy
2. Understand how drugs are procured, warehoused and distributed
3. Help the students to understand the important committees working within the hospital
4. Equip the students in manufacturing and quality control of few commonly used dosage forms within the hospital
5. Enable the students to apply the theoretical knowledge into real time hospital practice

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Student should understand the importance of various Drug distribution methods.

CO 2: Be acquainted with Professional Practice Management Skills in Hospital Pharmacies.

CO 3: Understand the professional responsibilities of hospital pharmacist and continuous professional development.

CO 4: Know manufacturing practices of various formulations in Hospital setup

CO 5: Appreciate the importance of various committees and their roles in Hospital

CO 6: Appreciate the stores management and inventory control.

HOSPITAL PHARMACY - PRACTICAL

Scope:

This course is designed to impart knowledge and skills necessary for maintaining the Hospital pharmacy and how to become a responsible hospital pharmacist. This course provides an in-depth understanding for the student regarding the various committees regulating the hospital pharmacy, preparation of budget, procurement and warehousing of drugs and pharmaceuticals, handling of radio pharmaceuticals which helps the students to clarify the theoretical understanding when they face real world scenario as hospital pharmacists.

Objectives: The primary objectives of this course are to

1. Discuss the fundamentals of hospital setup and hospital pharmacy
2. Understand how drugs are procured, warehoused and distributed
3. Help the students to understand the important committees working within the hospital
4. Equip the students in manufacturing and quality control of few commonly used dosage forms within the hospital
5. Appreciate the importance of various committees and their roles within the Hospital

Course Outcomes (COs):

At completion of this course it is expected that the students will be able to

CO 1: Define the basic concepts in Hospital pharmacy

CO 2 : Critically interpret and apply Inventory control methods

CO 3 : Execute professional responsibilities of hospital pharmacist and identify drug related problems

CO 4 : Provide professional services like patient counseling and technical inputs for parenteral nutritional support

CO 5 : Execute the activities related to hospital formulary and pharmacy and therapeutics committee

CO 6 : Able to manufacture common pharmaceutical formulations within Hospital setup

CLINICAL PHARMACY - THEORY

Scope: This course is designed to impart the basic knowledge and skills that are required to practice pharmacy including the provision of pharmaceutical care services to both healthcare professionals and patients in clinical settings.

Objectives: The primary objectives of this course are to

1. Discuss the basis and fundamentals (scope) of clinical pharmacy practice
2. Explain how to monitor the drug therapy of the patient through various methods
3. Help the students to understand drug related problems (DRP) and resolve it
4. Equip the students to detect, assess and monitor adverse drug reactions (ADR)
5. Enable the students to apply the theoretical knowledge into clinical practice to interpret selected laboratory results
6. Familiarize the sources of drug information / poison information & provision of services

Course Outcomes (COs): At completion of this course it is expected that the students will be able to (Know, Do and Appreciate)

CO 1: Define the role of clinical pharmacist at various healthcare settings
CO 2: Monitor drug therapy of the patient through medication chart review and clinical review
CO 3: Conduct the medication history interview and counsel the patients
CO 4: Detect, assess and monitor adverse drug reactions (ADR)
CO 5: Interpret selected laboratory results (as monitoring parameters) of specific disease states
CO 6: Provide drug / poison information services by retrieving, analyzing, interpreting and formulate drug and medicine information by utilizing various databases and softwares

CLINICAL PHARMACY - PRACTICAL

Scope: This course (practical) is designed to impart the basic knowledge and skills that are required to practice pharmacy including the provision of pharmaceutical care services to both healthcare professionals and patients in clinical settings.

Objectives: The primary objectives of this course are to

1. Discuss the basis and fundamentals (scope) of clinical pharmacy practice
2. Explain how to monitor the drug therapy of the patient through various methods and examples
3. Help the students to understand drug related problems (DRP) and resolve it using the current prescription(s)
4. Equip the students to detect, assess and monitor adverse drug reactions (ADR) with selected examples
5. Enable the students to apply the theoretical knowledge into clinical practice to interpret selected laboratory results with real time patient data and simulated data
6. Familiarize the sources of drug information / poison information & provision of services with selected examples

Course Outcomes (COs): At completion of this course it is expected that the students will be able to (Know, Do and Appreciate)

CO 1: Define the role of clinical pharmacist at various healthcare settings
CO 2: Monitor drug therapy of the patient through medication chart review and clinical review
CO 3: Conduct the medication history interview and counsel the patients
CO 4: Detect, assess and monitor adverse drug reactions (ADR)
CO 5: Interpret selected laboratory results (as monitoring parameters) of specific disease states
CO 6: Provide drug / poison information services by retrieving, analyzing, interpreting and formulate drug and medicine information by utilizing various databases and softwares.

BIOSTATISTICS AND RESEARCH METHODOLOGY - THEORY

Scope: This course is designed to impart knowledge and skills necessary for understanding the basic concepts, terms and definitions used in biostatistics and health research methodology

Objectives: The primary objectives of this course are to

1. Select a relevant research topic based on contemporary literature and apply Biostatistics concepts.
2. Compare basic quantitative (observational and experimental) study designs, understand their advantages, disadvantages and select the best for a specific research question.
3. Compute, apply and interpret results based on findings.
4. Test the hypothesis and apply research questions to interpret the results
5. Identify different clinical study designs
6. Understand the importance of computers in Community pharmacy

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Choose the appropriate research design and develop appropriate research hypothesis for a project

CO 2 : Develop an appropriate framework for research studies

CO 3: Know the various statistical methods to solve different types of problems

CO 4: Operate various statistical software packages

CO 5: Appreciate the importance of Computer in hospital and Community Pharmacy

CO 6: Appreciate the statistical technique in solving the pharmaceutical problems

BIOPHARMACEUTICS AND PHARMACOKINETICS - THEORY

Scope: This course is designed to impart knowledge and skills necessary for dose calculations, dose adjustments and to apply biopharmaceutics theories in practical problem solving. Basic theoretical discussions of the principles of biopharmaceutics and pharmacokinetics are provided to help the students to clarify the concepts.

Objectives: The primary objectives of this course are to

1. Discuss the fundamentals of biopharmaceutics and pharmacokinetics
2. Explain how various physicochemical characteristics of drugs, physiological characteristics and dosage form factors impact the biopharmaceutics and pharmacokinetic parameters
3. Help the students to understand the concepts of bioavailability and bioequivalence
4. Equip the students to calculate all possible pharmacokinetic parameters by using various pharmacokinetic models for any given data
5. Enable the students to apply the theoretical knowledge into clinical practice
6. Familiarize and train the students with software and electronic computational tools for pharmacokinetic calculations

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Define the basic concepts in biopharmaceutics and pharmacokinetics
CO 2 : Critically interpret biopharmaceutic studies including drug product equivalency
CO 3 : Use raw data and derive the pharmacokinetic models and parameters that best describe the process of drug absorption, distribution, metabolism and excretion
CO 4 : Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters
CO 5 : Identify potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them
CO 6 : Use software for various pharmacokinetic data analysis

BIOPHARMACEUTICS AND PHARMACOKINETICS - PRACTICAL

Scope: This course is designed to impart knowledge and skills necessary for dose calculations, dose adjustments and to apply biopharmaceutics theories in practical problem solving. Basic theoretical discussions of the principles of biopharmaceutics and pharmacokinetics are provided to help the students to clarify the concepts.

Objectives: The primary objectives of this course are to

1. Discuss the fundamentals of biopharmaceutics and pharmacokinetics
2. Explain how various physicochemical characteristics of drugs, physiological characteristics and dosage form factors impact the biopharmaceutics and pharmacokinetic parameters
3. Help the students to understand the concepts of bioavailability and bioequivalence
4. Equip the students to calculate all possible pharmacokinetic parameters by using various pharmacokinetic models for any given data
5. Enable the students to apply the theoretical knowledge into clinical practice
6. Familiarize and train the students with software and electronic computational tools for pharmacokinetic calculations

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Define the basic concepts in biopharmaceutics and pharmacokinetics
CO 2 : Critically interpret biopharmaceutic studies including drug product equivalency
CO 3 : Use raw data and derive the pharmacokinetic models and parameters that best describe the process of drug absorption, distribution, metabolism and excretion
CO 4 : Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters
CO 5 : Identify potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them
CO 6 : Use software for various pharmacokinetic data analysis

CLINICAL TOXICOLOGY - THEORY

Scope: This course is designed to impart a thorough knowledge in the management of various poisoning cases thereby enabling the students to assist healthcare professionals / toxicologists in handling and managing the emergency cases.

Objectives: The primary objectives of this course are to

1. Understand and deal with general principles involved in the management of poisoning
2. Recognize the clinical symptoms and manage poisoning cases
3. Educate public and healthcare professionals in the management of emergency cases
4. Minimize/ prevent the poisoning cases in local population

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Demonstrate the basic understanding of general principles and fundamentals of poisoning

CO 2 : Evaluate and categorize the type of poisoning based on clinical presentation and Toxic syndrome

CO 3 : Assess the type of management applicable to poison

CO 4 : Estimate the antidote and its application for specific poison

CO 5: Provide awareness to the public to prevent Accidental poisoning

PHARMACOTHERAPEUTICS I & II - THEORY

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are to

1. The pathophysiology of selected disease states and the rationale for drug therapy.
2. The therapeutic approach to management of these diseases.
3. The controversies in drug therapy.
4. The importance of preparation of individualized therapeutic plans based on diagnosis.
5. Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).
6. Describe the pathophysiology of selected disease states and explain the rationale for drug therapy.
7. Summarize the therapeutic approach to management of these diseases including reference to the latest available evidence.
8. Discuss the controversies in drug therapy.
9. Discuss the preparation of individualized therapeutic plans based on diagnosis.
10. Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Describe the pathophysiology and management of the disease conditions as prescribed in the course.

CO 2: Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.

CO 3: Apply knowledge and clinical skills of care of patients.

CO 4: Develop communication skills to interact with other health care professionals.

PHARMACOTHERAPEUTICS I & II - PRACTICAL

Scope: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Objectives: The primary objectives of this course are to

1. The pathophysiology of selected disease states and the rationale for drug therapy.
2. The therapeutic approach to management of these diseases.
3. The controversies in drug therapy.
4. The importance of preparation of individualized therapeutic plans based on diagnosis.
5. Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).
6. Describe the pathophysiology of selected disease states and explain the rationale for drug therapy.
7. Summarize the therapeutic approach to management of these diseases including reference to the latest available evidence.
8. Discuss the controversies in drug therapy.
9. Discuss the preparation of individualized therapeutic plans based on diagnosis.
10. Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1: Describe the pathophysiology and management of the disease conditions as prescribed in the course.

CO 2: Capable to utilize information from guidelines, literature and with the approach of all relevant evidence base, the student should be able to devise, formulate and plan medication management in a clinical situation.

CO 3: Apply knowledge and clinical skills of care of patients.

CO 4: Develop communication skills to interact with other health care professionals.

V PharmD

CLINICAL RESEARCH - THEORY

Scope: This course is designed to make the students to understand the principles and gain adequate knowledge regarding the various approaches to drug discovery including clinical phase of development. Also enables the students to understand and implement all regulatory and ethical requirements that are required during the process of drug development.

Objectives: The primary objectives of this course are to

1. Know the concept of new drug development process.
2. Understand the regulatory and ethical requirements.
3. Conduct the clinical trials in accordance with regulatory and ethical requirements.
4. Coordinate the clinical trials and promote quality drug trial research.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Understanding of basic concepts of drug development process what it is, how it differs from standard care and why it is undertaken. Demonstrate the competencies of clinical research designs and the regulatory approval process.

CO 2 : Familiarize with the various regulatory documents and the guidelines and to evaluate critical domestic and global regulatory and health care implications on the product development.

CO 3 : Effectively assess and manage ethical aspects of conduct of clinical trial.

CO 4 : Familiarize with the roles and responsibilities of the personnel involved in conduct of clinical research to ensure the quality research is undertaken

PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS - THEORY

Scope: This course is designed to to impart knowledge regarding various methods and applications of pharmacoepidemiology and pharmacoeconomics in drug safety monitoring, drug approval & regulations, examine the costs of different therapeutic interventions and therapeutic outcomes.

Objectives: The primary objectives of this course are to

1. Understand the scope and applications of pharmacoepidemiology and pharmacoeconomics
2. Understand pharmacoepidemiological outcome measures
3. Adopt the tools effectively in evaluating risk and benefit of therapy
4. Conduct pharmacoepidemiology studies and evaluate the outcomes of measures
5. Understand the pharmacoepidemiological databases
6. Understand pharmacoeconomic outcome measures
7. Conduct pharmacoeconomic studies and evaluate the outcomes of treatment
8. Understand the applications of softwares in Pharmacoepidemiology and Pharmacoeconomic analysis.

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO1: Identify the applications of pharmacoepidemiology and pharmacoeconomics in clinical settings

CO2: Discuss the various pharmacoepidemiological outcome measures

CO3: Describe the concept of risk in pharmacoepidemiology and different methods of measuring risk

CO4: Explain the various pharmacoepidemiological methods

CO5: Explain the sources of data for pharmacoepidemiological studies

CO6: Discuss the methods to measure outcomes in pharmacoeconomic studies

CO7: Describe the current pharmacoeconomic evaluation methods

CO8: Softwares used in Pharmacoepidemiology and Pharmacoeconomics Analysis

CLINICAL PHARMACOKINETICS AND PHARMACOTHERAPEUTIC DRUG MONITORING -THEORY

Scope: This course is designed to make the students to understand and apply pharmacokinetic principles in designing / individualizing dosage regimen. Also, enable the students to interpret the plasma drug range, and hepatic / renal function in optimizing the drug therapy.

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

1. Design the drug therapy regimen for individual patient
2. Interpret and correlate the plasma drug concentration with patient's therapeutic outcome.
3. Recommend dosage adjustment for patients with renal/ hepatic impairment
4. Detect and manage drug-drug interactions

Course Outcomes (COs): At completion of this course it is expected that the students will be able to

CO 1 : Design the dosage regimen for the given drug based on the pharmacokinetic principles and route of administration

CO 2 : Individualize the dosage regimen for the patients with altered pharmacokinetics viz. renal / hepatic impairment, pediatrics, geriatrics, etc.

CO 3 : Intervene the potential drug-drug interactions in a given case with appropriate recommendations for dosage adjustments

CO 4 : Associate the genetic polymorphisms of the patients, if any with the clinical outcomes of the patients

CO 5 : Formulate protocol(s) for the therapeutic drug monitoring of drug(s) and initiate the service in collaboration with other healthcare team members

CO 6 : Interpret the results of therapeutic drug monitoring services of various drugs and give required recommendations for the dosage adjustment of those drugs, if required towards optimizing the treatment outcome