FIRST YEAR PHARM D

1.1 HUMAN ANATOMY & PHYSIOLOGY (THEORY)

Scope and Objectives: 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 a pharmacist, is used to correct the deviations in the human body, it enhances the understanding of how the drugs act on the various body systems in correcting the disease state of the organs.

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

a. Describe the structure (gross and histology) and functions of various organs of the human body;

b. Describe the various homeostatic mechanisms and their imbalances of various systems;

c. Identify the various tissues and organs of the different systems of the human body;

d. Perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes;

e. Appreciate coordinated working pattern of different organs of each system;

f. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body

1.2 - PHARMACEUTICS (THEORY)

Scope and objectives: This course is designed to impart a fundamental knowledge on the art and science of formulating different dosage forms. It prepares the students for the most basic of the applied field of pharmacy.

2. Upon the completion of the course the student should be able to:

a. know the formulation aspects of different dosage forms;

b. do different pharmaceutical caluculation involved in formulation;

c. formulate different types of dosage forms; and

d. appreciate the importance of good formulation for effectiveness.

1.3 - MEDICINAL BIOCHEMISTRY (THEORY)

Scope of the Subject: Applied biochemistry deals with complete understanding of the molecular level of the chemical process associated with living cells.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 of the Subject (Know, do, appreciate) :

The objective of the present course is providing biochemical facts and the principles to the students of pharmacy. Upon completion of the subject student shall be able to –

a. understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases;

b. know the metabolic process of biomolecules in health and illness (metabolic disorders);

c. understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism;

d. know the biochemical principles of organ function tests of kidney, liver and endocrine gland; and

e. do the qualitative analysis and determination of biomolecules in the body fluids.

1.4 - PHARMACEUTICAL ORGANIC CHEMISTRY (THEORY)

Scope and objectives: This course is designed to impart a very good knowledge about

a) IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds;

b) Some important physical properties of organic compounds;

c) Free radical/ nucleophyllic [alkyl/ acyl/ aryl] /electrophyllic substitution, free radical/ nucleophyllic / electrophyllic addition, elimination, oxidation and reduction reactions with mechanism, orientation of the reaction, order of reactivity, stability of compounds;

d) Some named organic reactions with mechanisms; and

e) Methods of preparation, test for purity, principle involved in the assay, important medicinal uses of some important organic compounds.

1.5 - PHARMACEUTICAL INORGANIC CHEMISTRY (THEORY)

Scope and objectives: This course mainly deals with fundamentals of Analytical chemistry and also the study of inorganic pharmaceuticals regarding their monographs and also the course deals with basic knowledge of analysis of various pharmaceuticals.

Upon completion of the course student shall be able to:

a. understand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals;

b. know the analysis of the inorganic pharmaceuticals their applications; and

c. appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.

1.6 - REMEDIAL MATHEMATICS/BIOLOGY (THEORY)

Scope and objectives: This is an introductory course in mathematics. This subjects deals with the introduction to matrices, determinants, trigonometry, analytical geometry, differential calculus, integral calculus, differential equations, laplace transform.

2. Upon completion of the course the student shall be able to : –

a) Know Trignometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications;

b) solve the problems of different types by applying theory; and

c) appreciate the important applications of mathematics in pharmacy.

BIOLOGY :

Scope and objectives: This is an introductory course in Biology, which gives detailed study of natural sources such as plant and animal origin. This subject has been introduces to the pharmacy course in order to make the student aware of various naturally occurring drugs and its history, sources, classification, distribution and the characters of the plants and animals. This subject gives basic foundation to Pharmacognosy.

SECOND YEAR PHARM D

2.1 - PATHOPHYSIOLOGY (THEORY)

Scope of the Subject: 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 of the Subject : Upon completion of the subject student shall be able to

a) describe the etiology and pathogenesis of the selected disease states;

b) name the signs and symptoms of the diseases; and

c) mention the complications of the diseases.

2.2 - PHARMACEUTICAL MICROBIOLOGY (THEORY)

Scope of the Subject: 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. Pharmaceutical biotechnology is the logical extension of pharmaceutical microbiology, which is expected to change the complete drug product scenario in the future.

This course deals with the various aspects of microorganisms, its classification, morphology, laboratory cultivation identification and maintenance. Its 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.

2 Objectives of the Subject :

Upon completion of the subject student shall be able to –

a. know the anatomy, identification, growth factors and sterilization of microorganisms;

b. know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect;

c. do estimation of RNA and DNA and there by identifying the source;

d. do cultivation and identification of the microorganisms in the laboratory;

e. do identification of diseases by performing the diagnostic tests; and

f. appreciate the behavior of motility and behavioral characteristics of microorganisms.

2.3 - PHARMACOGNOSY & PHYTOPHARMACEUTICALS (THEORY)

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

Upon completion of the course student shall be able to:

a. under stand the basic principles of cultivation, collection and storage of crude drugs;

b. know the source, active constituents and uses of crude drugs; and

c. appreciate the applications of primary and secondary metabolites of the plant.

2.4 - PHARMACOLOGY – I (THEORY)

Scope of the Subject: 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. In addition to theoretical knowledge, the basic practical knowledge relevant to therapeutics will be imparted.

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

a. understand the pharmacological aspects of drugs falling under the above mentioned chapters;

b. handle and carry out the animal experiments;

c. appreciate the importance of pharmacology subject as a basis of therapeutics; and

d. correlate and apply the knowledge therapeutically.

2.5 - 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 counselling, health screening services for improved patient care in the community set up.

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

a. know pharmaceutical care services;

b. know the business and professional practice management skills in community pharmacies;

c. do patient counselling & provide health screening services to public in community pharmacy;

d. respond to minor ailments and provide appropriate medication;

e. show empathy and sympathy to patients; and

f. appreciate the concept of Rational drug therapy.

2.6 - PHARMACOTHERAPEUTICS - I (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 counselling, health screening services for improved patient care in the community set up.

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

a. know pharmaceutical care services;

b. know the business and professional practice management skills in community pharmacies;

c. do patient counselling & provide health screening services to public in community pharmacy;

d. respond to minor ailments and provide appropriate medication;

e. show empathy and sympathy to patients; and

f. appreciate the concept of Rational drug therapy.

2.6 - PHARMACOTHERAPEUTICS - I (THEORY)

Scope of the Subject: 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.

2. Objectives: At completion of this subject it is expected that students will be able to understand –

a. the pathophysiology of selected disease states and the rationale for drug therapy;

b. the therapeutic approach to management of these diseases;

c. the controversies in drug therapy;

d. the importance of preparation of individualised therapeutic plans based on diagnosis;

e. 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);

f. describe the pathophysiology of selected disease states and explain the rationale for drug therapy;

g. summarise the therapeutic approach to management of these diseases including reference to the latest available evidence;

h. discuss the controversies in drug therapy;

i. discuss the preparation of individualised therapeutic plans based on diagnosis; and

j. 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).

THIRD YEAR PHARM D

3.1 - PHARMACOLOGY – II (THEORY)

Scope of the Subject: 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, drugs acting on autacoids, respiratory system, GIT, immune system and hormones, and pharmacology of autocoids and hormones will be concentrated. In addition, pharmacology of chemotherapeutic agents, vitamines, essential minerals and principles of toxicology are also taught. In addition to theoretical knowledge, the basic practical knowledge relevant to therapeutics will be imparted.

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

a. understand the pharmacological aspects of drugs falling under the above mentioned chapters,

b. carry out the animal experiments confidently,

c. appreciate the importance of pharmacology subject as a basis of therapeutics, and

d. correlate and apply the knowledge therapeutically.

3.2 - PHARMACEUTICAL ANALYSIS (THEORY)

3.3 - PHARMACOTHERAPEUTICS – II (THEORY)

Scope of the Subject: 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 of the Subject Upon completion of the subject student shall be able to –

a. know the pathophysiology of selected disease states and the rationale for drug therapy

b. know the therapeutic approach to management of these diseases;

c. know the controversies in drug therapy;

d. know the importance of preparation of individualised therapeutic plans based on diagnosis; and

e. appreciate the 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).

3.4 - PHARMACEUTICAL JURISPRUDENCE (THEORY)

Scope of the Subject: (4-6 lines): 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 are 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.

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

a. practice the Professional ethics;

b. understand the various concepts of the pharmaceutical legislation in India;

c. know the various parameters in the Drug and Cosmetic Act and rules;

d. know the Drug policy, DPCO, Patent and design act;

3.5 - MEDICINAL CHEMISTRY (THEORY)

Objectives of the Subject:

- Understand modern methods of Rational Drug Design (RADD).
- Analyze the Quantitative Structure-Activity Relationship (QSAR) to modify drug structures for better efficacy.
- Learn the chemical classification, Structure-Activity Relationship (SAR), and mechanism of action of major antibiotics (e.g., β-lactams, tetracyclines, macrolides).

3.6 - PHARMACEUTICAL FORMULATIONS (THEORY)

Scope of the Subject: Scope and objectives of the course: Subject deals with the formulation and evaluation of various pharmaceutical dosage forms.

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

a. understand the principle involved in formulation of various pharmaceutical dosage forms;

b. prepare various pharmaceutical formulation;

c. perform evaluation of pharmaceutical dosage forms; and

d. understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.

FOURTH YEAR PHARM D

4.1 - 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: At completion of this subject it is expected that students will be able to understand –

a. the pathophysiology of selected disease states and the rationale for drug therapy;

b. the therapeutic approach to management of these diseases;

c. the controversies in drug therapy;

4.2 - HOSPITAL PHARMACY (THEORY)

Scope: In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug dispensing, manufacturing of parenteral preparations, drug information, patient counselling, and therapeutic drug monitoring for improved patient care.

Objectives: Upon completion of the course, the student shall be able to –
know various drug distribution methods;

know the professional practice management skills in hospital pharmacies;

provide unbiased drug information to the doctors;

know the manufacturing practices of various formulations in hospital set up;

appreciate the practice based research methods; and

appreciate the stores management and inventory control.

4.3 - CLINICAL PHARMACY (THEORY)

Objectives of the Subject :
Upon completion of the subject student shall be able to (Know, do, appreciate) –
a. monitor drug therapy of patient through medication chart review and clinical review;

b. obtain medication history interview and counsel the patients;

c. identify and resolve drug related problems;

d. detect, assess and monitor adverse drug reaction;

e. interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; and

f. retrieve, analyse, interpret and formulate drug or medicine information.

4.4 - BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)

The primary goals of this theory course revolve around proper experimental design and valid data interpretation

- Research Design: Understanding the systematic process of defining a research problem, formulating valid hypotheses, and determining appropriate sample sizes.
- Data Summarization: Equipping students to effectively organize, present, and analyze data using frequency distributions, graphs, and descriptive statistics.
- Practical Application: Introducing modern statistical software to simulate, analyze, and interpret clinical or pharmaceutical trials.

4.5 - BIOPHARMACEUTICS AND PHARMACOKINETICS (THEORY)

- Understand ADME Principles: Comprehend the fundamental processes of drug Absorption, Distribution, Metabolism, and Excretion (ADME)
- Bioavailability & Bioequivalence: Assess the rate and extent of drug absorption into systemic circulation and evaluate the equivalency of different drug formulations
- Dosage Regimen Design: Design, individualize, and adjust dosage schedules based on patient-specific factors, genetics, and disease states to ensure patient safety.

4.6 - CLINICAL TOXICOLOGY (THEORY)

- Toxidrome Identification: Train students to recognize characteristic clinical symptoms, signs, and syndromes associated with different classes of toxins (e.g., organophosphates, opioids, sedatives).
- Gut Decontamination & Elimination: Instruct students on methods to prevent further toxin absorption (e.g., gastric lavage, activated charcoal) and techniques to enhance toxin excretion (e.g., forced diuresis, hemodialysis)
- Supportive Care: Emphasize the critical role of non-specific, supportive medical care for poisoned patients, including fluid/electrolyte management and CNS monitoring

FIFTH YEAR PHARM D

5.1 - CLINICAL RESEARCH (THEORY)

- **Drug Development Process:** Understand the complete lifecycle of investigational drugs, from initial discovery and preclinical testing through to the various clinical trial phases (Phases 0-IV)
- **Ethical Guidelines & Compliance:** Master the implementation of ICH GCP (International Council for Harmonisation - Good Clinical Practice) principles, ensuring patient rights, safety, and informed consent in human subject research
- **Protocol & Documentation:** Gain proficiency in writing critical clinical trial documents, including clinical study protocols, Case Report Forms (CRFs), and Informed Consent Forms (ICFs)

5.2 - PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS (THEORY)

- Evaluate Real-World Safety: Monitor medications post-marketing to identify rare or long-term Adverse Drug Reactions (ADRs) that clinical trials might miss
- Measure Drug Outcomes: Quantify clinical outcomes and establish the prevalence and incidence rates of drug-related events. [1]
- Formulary Management: Apply pharmacoeconomic principles (e.g., Cost-Minimization, Cost-Effectiveness, Cost-Utility, and Cost-Benefit analyses) to make evidence-based decisions for hospital formularies

5.3 - CLINICAL PHARMACOKINETICS AND THERAPEUTIC DRUG MONITORING (THEORY)

- Design Individualized Dosing: Apply pharmacokinetic parameters to calculate initial doses, maintenance doses, and loading doses for specialized populations (e.g., pediatric, geriatric, and obese patients) using nomograms and tabulations.
- Implement TDM Protocols: Identify clinical indications for Therapeutic Drug Monitoring (TDM) and establish protocols for appropriate blood sampling, analysis, and interpretation of peak and trough levels.
- Apply Pharmacokinetics/Pharmacodynamics (PK/PD): Correlate plasma drug concentrations with clinical responses to differentiate between treatment failure, adverse drug reactions, and patient non-adherence.