B.PHARMACY

PROGRAMME OUTCOME/PROGRAMME SPECIFIC OUTCOME AND COURSE OUTCOME

PROGRAM OUTCOME:The objective of the program is to equip a student in the field of pharmacy with respect to the following attributes: Knowledge, skill and attitude. A detailed list of outcomes in each of these attributes is presented below:

KNOWLEDGE:

1. Basic principles of Pharmaceutical chemistry, Pharmaceutics including cosmetics, Pharmacology/ and Pharmacognosy including Herbal drugs
2. Practical aspects of synthesis, formulation and analysis of various pharmaceutical and Herbal medicinal agents
3. Practical aspects of delivering a quality assured product as per pharmacopoeia, WHO and ISO standards
4. Practical aspects of delivering a quality assured product as per pharmacopoeia, WHO and ISO standards
5. Clinical studies for patient counseling leading to physical and social well being of patients.
6. Product detailing and marketing of Pharmaceutical products.

SKILLS:

1. Able to synthesize, purify, identify and analyze medicinal agents.
2. Able to formulate, store, dispense, analyze the prescriptions and / or manufacture the medicinal agents at commercial level.
3. Able to learn and apply the quality assurance principles including legal and ethical aspects involving drugs.
4. Able to extract, purify, identify and know the therapeutic value of herbal / crude / natural products.
5. Able to screen various medicinal agents using animal models for pharmacological activity.
6. Be able to produce and market dosage forms and be responsible in minimizing the pollution hazards, by using proper scientific and logical techniques.
7. Should be capable of functioning independently in both rural and urban environments.

ATTITUDE:

1. Willing to apply the current knowledge of pharmacy in the best interest of patients and the community.
2. Maintain a high standard of professional ethics in discharging professional obligations.
3. Continuously upgrade professional information and be conversant with latest advances in Pharmacy field to serve the community better.
4. Willing to participate in continuing education programmes of PCI and AICTE to upgrade knowledge and professional skills.
5. To help and to participate in the implementation of National Health programs.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

COURSE OUTCOME

B. PHARM I SEMESTER

Upon completion of the following courses, students shall be able to

BP101T. HUMAN ANATOMY AND PHYSIOLOGY-I

1.Explain the gross morphology, structure and functions of various organs of the human body.

2. Describe the various homeostatic mechanisms and their imbalances.

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

4. Perform the various experiments related to special senses and nervous system.

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

BP102T. PHARMACEUTICAL ANALYSIS

1. Understand the principles of volumetric and electro chemical analysis.
2. Carryout various volumetric and electrochemical titrations.
3. Develop analytical skills.

BP103T. PHARMACEUTICS- I

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

BP104T. PHARMACEUTICAL INORGANIC CHEMISTRY

1. Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals

2. Understand the medicinal and pharmaceutical importance of inorganic compounds

BP105T.COMMUNICATION SKILLS

1. Understand the behavioural needs for a Pharmacist to function effectively in the areas of pharmaceutical operation

2. Communicate effectively (Verbal and Non-Verbal)

3. Effectively manage the team as a team player

4. Develop interview skills

5. Develop Leadership qualities and essentials

BP 106RBT.REMEDIAL BIOLOGY

1. Know the classification and salient features of five kingdoms of life

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

2. understand the basic components of anatomy & physiology of plant
3. know understand the basic components of anatomy & physiology animal with special reference to human.

BP 106RMT.REMEDIAL MATHEMATICS

1. Know the theory and their application in Pharmacy

2. Solve the different types of problems by applying theory

3. Appreciate the important application of mathematics in Pharmacy

B. PHARM II SEMESTER:

BP 201T. HUMAN ANATOMY AND PHYSIOLOGY-II

1. Explain the gross morphology, structure and functions of various organs of the human body.

2. Describe the various homeostatic mechanisms and their imbalances.

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

4. Perform the haematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.

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

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

BP202T. PHARMACEUTICAL ORGANIC CHEMISTRY –I

1. write the structure, name and the type of isomerism of the organic compound

2. write the reaction, name the reaction and orientation of reactions

3. account for reactivity/stability of compounds,

4. identify/confirm the identification of organic compound.

BP203 T. BIOCHEMISTRY

1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.

2. Understand the metabolism of nutrient molecules in physiological and pathological conditions.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

3. Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

BP 204T.PATHOPHYSIOLOGY

1. Describe the etiology and pathogenesis of the selected disease states;

2. Name the signs and symptoms of the diseases;

3. Mention the complications of the diseases

BP205 T. COMPUTER APPLICATIONS IN PHARMACY

1. know the various types of application of computers in pharmacy

2. know the various types of databases

3. know the various applications of databases in pharmacy

BP 206 T. ENVIRONMENTAL SCIENCES

1. Create the awareness about environmental problems among learners.

2. Impart basic knowledge about the environment and its allied problems.

3. Develop an attitude of concern for the environment.

4. Motivate learner to participate in environment protection and environment improvement.
5. Acquire skills to help the concerned individuals in identifying and solving environmental problems.

6. Strive to attain harmony with Nature.

III SEMESTER B. PHARM

BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II

1. write the structure, name and the type of isomerism of the organic compound

2. write the reaction, name the reaction and orientation of reactions

3. account for reactivity/stability of compounds,

4. prepare organic compounds

BP302T. PHYSICAL PHARMACEUTICS-I

1. Understand various physicochemical properties of drug molecules in the designing the dosage form

2. Know the principles of chemical kinetics & to use them in assigning expiry date for formulation

3. Demonstrate use of physicochemical properties in evaluation of dosage forms.

4. Appreciate physicochemical properties of drug molecules in formulation research and development

BP 303 T. PHARMACEUTICAL MICROBIOLOGY

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

1. Understand methods of identification, cultivation and preservation of various microorganisms

2. Importance of sterilization in microbiology. and pharmaceutical industry

3. Learn sterility testing of pharmaceutical products.

4. Microbiological standardization of Pharmaceuticals.

5. Understand the cell culture technology and its applications in pharmaceutical industries.

BP 304 T. PHARMACEUTICAL ENGINEERING

Upon completion of the course student shall be able:

1. To know various unit operations used in Pharmaceutical industries.

2. To understand the material handling techniques.

3. To perform various processes involved in pharmaceutical manufacturing process.

4. To carry out various test to prevent environmental pollution.

5. To appreciate and comprehend significance of plant lay out design for optimum use of resources.

6. To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries

IV SEMESTER B. PHARM

BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III

At the end of the course, the student shall be able to

1. understand the methods of preparation and properties of organic compounds

2. explain the stereo chemical aspects of organic compounds and stereo chemical reactions

3. know the medicinal uses and other applications of organic compounds

BP402T. MEDICINAL CHEMISTRY – I

o

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

BP 403 T. PHYSICAL PHARMACEUTICS-II

1. Understand various physicochemical properties of drug molecules in the designing the dosage form

2. Know the principles of chemical kinetics & to use them in assigning expiry date for Formulation

3. Demonstrate use of physicochemical properties in evaluation of dosage forms.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

4. Appreciate physicochemical properties of drug molecules in formulation research and Development

BP 404 T. PHARMACOLOGY-I

1. Understand the pharmacological actions of different categories of drugs

2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.

3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.

4. Observe the effect of drugs on animals by simulated experiments

5. Appreciate correlation of pharmacology with other bio medical sciences

BP 405 T. PHARMACOGNOSY AND PHYTOCHEMISTRY I

Upon completion of the course, the student shall be able

1. to know the techniques in the cultivation and production of crude drugs

2. to know the crude drugs, their uses and chemical nature

3. know the evaluation techniques for the herbal drugs

4. to carry out the microscopic and morphological evaluation of crude drugs

V SEMESTER B. PHARM

BP501T. MEDICINAL CHEMISTRY – II

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 of different class of drugs

4. Study the chemical synthesis of selected drugs

BP 502 T. FORMULATIVEPHARMACY

1. Know the various pharmaceutical dosage forms and their manufacturing techniques.

2. Know various considerations in development of pharmaceutical dosage forms

3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality

BP503. T. PHARMACOLOGY-II

1. Understand the mechanism of drug action and its relevance in the treatment of different diseases

2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments

3. Demonstrate the various receptor actions using isolated tissue preparation

4. Appreciate correlation of pharmacology with related medical sciences

BP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

1. to know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents

2. to understand the preparation and development of herbal formulation.

3. to understand the herbal drug interactions

4. to carryout isolation and identification of phytoconstituents

BP 505 T. PHARMACEUTICAL JURISPRUDENCE

1. The Pharmaceutical legislations and their implications in the development and marketing
2. Various Indian pharmaceutical Acts and Laws

3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals

4. The code of ethics during the pharmaceutical practice

VI SEMESTER B. PHARM

BP601T. MEDICINAL CHEMISTRY – III

1. Understand the importance of drug design and different techniques of drug design.

2. Understand the chemistry of drugs with respect to their biological activity.

3. Know the metabolism, adverse effects and therapeutic value of drugs.

4. Know the importance of SAR of drugs

BP602 T. PHARMACOLOGY-III

1. understand the mechanism of drug action and its relevance in the treatment of different infectious diseases

2. comprehend the principles of toxicology and treatment of various poisonings and

3. appreciate correlation of pharmacology with related medical sciences

BP 603 T. HERBAL DRUG TECHNOLOGY

1. understand raw material as source of herbal drugs from cultivation to herbal drug product
2. know the WHO and ICH guidelines for evaluation of herbal drugs

3. know the herbal cosmetics, natural sweeteners, nutraceuticals

4. appreciate patenting of herbal drugs, GMP.

BP 604 T. BIOPHARMACEUTICS AND PHARMACOKINETICS

1. Understand the basic concepts in biopharmaceutics and pharmacokinetics.

2. Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.

3. Critically evaluate biopharmaceutic studies involving drug product equivalency

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

4. Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.

5. detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them

BP 605 T. PHARMACEUTICAL BIOTECHNOLOGY

1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries

2. Genetic engineering applications in relation to production of pharmaceuticals

3. Importance of Monoclonal antibodies in Industries

4. Appreciate the use of microorganisms in fermentation technology

BP606T PHARMACEUTICAL QUALITY ASSURANCE

1. understand the cGMP aspects in a pharmaceutical industry

2. appreciate the importance of documentation

3. understand the scope of quality certifications applicable to pharmaceutical industries

4. understand the responsibilities of QA & QC departments

VII SEMESTER B. PHARM

BP701T. INSTRUMENTAL METHODS OF ANALYSIS

1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis

2. Understand the chromatographic separation and analysis of drugs.

3. Perform quantitative & qualitative analysis of drugs using various analytical instruments.

BP 702 T. INDUSTRIAL PHARMACY

1. Know the process of pilot plant and scale up of pharmaceutical dosage forms

2. Understand the process of technology transfer from lab scale to commercial batch

3. Know different laws and acts that regulate pharmaceutical industry in India and US

4. Understand the approval process and regulatory requirements for drug products

Course

BP 703T. PHARMACY PRACTICE

1. know various drug distribution methods in a hospital

2. appreciate the pharmacy stores management and inventory control

3. monitor drug therapy of patient through medication chart review and clinical review

4. obtain medication history interview and counsel the patients

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

5. identify drug related problems

6. detect and assess adverse drug reactions

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

8. know pharmaceutical care services

9. do patient counselling in community pharmacy;

10. appreciate the concept of Rational drug therapy

BP 704T: NOVEL DRUG DELIVERY SYSTEMS

1. To understand various approaches for development of novel drug delivery systems.

2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation

VIII SEMESTER B. PHARM

BP801T. BIOSTATISITCS AND RESEARCH METHODOLOGY

1. Know the operation of M.S. Excel, SPSS, R and MINITAB ® , DoE (Design of Experiment)
2. Know the various statistical techniques to solve statistical problems
3. Appreciate statistical techniques in solving the problems.

BP 802T SOCIAL AND PREVENTIVE PHARMACY

1. Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
2. Have a critical way of thinking based on current healthcare development.
3. Evaluate alternative ways of solving problems related to health and pharmaceutical issues

BP803ET. PHARMACEUTICAL MARKETING

The course aim is to provide an understanding of marketing concepts and techniques and the application of the same in the pharmaceutical industry.

BP804 ET: PHARMACEUTICAL REGULATORY SCIENCE

1. Know about the process of drug discovery and development

2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals

3. Know the regulatory approval process and their registration in Indian and international markets

BP 805T: PHARMACOVIGILANCE (Theory)

At completion of this paper it is expected that students will be able to (know, do, and appreciate):

1. The importance of drug safety monitoring

2. History and development of pharmacovigilance

3. National and international scenario of pharmacovigilance

4. Dictionaries, coding and terminologies used in pharmacovigilance

5. Detection of new adverse drug reactions and their assessment

6. International standards for classification of diseases and drugs

7. Adverse drug reaction reporting systems and communication in pharmacovigilance

8. Methods to generate safety data during pre- clinical, clinical and post approval phases of drugs 'life cycle

9. Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation

10. Pharmacovigilance Program of India (PvPI)

11. ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning

-12. CIOMS requirements for ADR reporting 13. Writing case narratives of adverse events and their quality.

BP 806 ET. QUALITY CONTROL AND STANDARDIZATION OF HERBALS (Theory)

1. WHO guidelines for quality control of herbal drugs

2. Quality assurance in herbal drug industry

3. the regulatory approval process and their registration in Indian and international markets

4. Appreciate EU and ICH guidelines for quality control of herbal drugs

BP 807 ET. COMPUTER AIDED DRUG DESIGN (Theory)

1. Design and discovery of lead molecules
2. The role of drug design in drug discovery process
3. The concept of QSAR and docking
4. Various strategies to develop new drug like molecules.
5. The design of new drug molecules using molecular modelling software

BP808ET: CELL AND MOLECULAR BIOLOGY (Elective subject)

1. Summarize cell and molecular biology history.

2. Summarize cellular functioning and composition.

3. Describe the chemical foundations of cell biology.

4.Summarize the DNA properties of cell biology.

5. Describe protein structure and function.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

6. Describe cellular membrane structure and function.

7. Describe basic molecular genetic mechanisms.

8. Summarize the Cell Cycle Course

BP810 ET. EXPERIMENTAL PHARMACOLOGY

1. Appreciate the applications of various commonly used laboratory animals.

2. Appreciate and demonstrate the various screening methods used in preclinical research

3.Appreciate and demonstrate the importance of biostatistics and research methodology

4. Design and execute a research hypothesis independently

BP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES

1. Understand the advanced instruments used and its applications in drug analysis
1. understand the chromatographic separation and analysis of drugs.
2. understand the calibration of various analytical instruments
3. know analysis of drugs using various analytical instruments.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

D. PHARM

PROGRAMME OUTCOMES

1. Assess various disease conditions, read and interpret drug prescription.
2. To prepare, package, label and dispense medications, perform non-sterile compounding.
3. Read, interpret and processing prescription.
4. Maintain an inventory record, analyze, organize, improvise and manage documents.
5. Create awareness in society about the effective and safe use of medicines
6. Respect patients, healthcare providers and pharmacy co-workers.
7. Apply knowledge of ethics to patient's as well as to the society.

COURSE OUTCOMES

D. PHARM I YEAR

PHARMACEUTICS

1. Define and identify the dosage form
2. Explain the history and use of the official books.
3. Prescription, , Latin abbreviations and pharmaceutical calculations.
4. Unit operations used in the pharmaceutical industry
5. Overview of manufacturing of common dosage forms such as tablets, capsules and parentrals.
6. Materials used for the packing of formulation and types of packing in dosage form.
7. Formulation of tablets and capsules and immunological product.

PHARMACEUTICAL CHEMISTRY –I

1. Understand the medicinal and pharmaceutical importance of inorganic compounds
2. Know the monographs of inorganic drugs and pharmaceuticals.
3. Know the analysis of the inorganic pharmaceuticals their applications.
4. Knowledge and understanding about Radio pharmaceuticals.

PHARMACOGNOSY

1. Understand the basic principles of cultivation, collection and storage of crude drugs.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

2. Know the sources, active constituents, and uses of crude drugs.
3. Appreciation the applications of primary and secondary metabolites of the plants.
4. To make the students aware of medicinal use and various naturally occurring drugs, its history,sources, distribution, methods of cultivation,active constituents, medicinal uses, identification tests,preservation methods, substitutes and adulterants.

BIOCHEMISTRYAND CLINICAL PATHOLOGY

1. Assess the various abnormal constituents of urine and their significance in diseases and also erythrocytes abnormal cells and their significance, Platelets-role in health
2. Know the chemistry of carbohydrates, lipids, proteins and vitamins.
3. Study of normal and abnormal metabolism of carbohydrates,protein and lipids.
4. Do the qualitative analysis and determination of biomolecules in the body fluids.
5. Understand the importance of biochemistry in medical profession

HUMAN ANATOMY AND PHYSIOLOGY

1. Elementary knowledge of basic cellular structures and tissues.
2. Knowledge of basic anatomical and physiological aspects of each organ system.
3. Knowledge of important diseases and disorders of various organ systems.
4. Describe the various homeostatic mechanisms and their imbalances.
5. Identify the various tissues and organs of different systems of human body.
6. Perform the various experiments related to special senses and nervous system.

HEALTH EDUCATION AND COMMUNITY PHARMACY

1. Understand the basics of health, nutritions and concept of prevention of diseases.
2. Know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect.
3. Know the different mode infections and epidemiology of diseases.
4. Know pharmaceutical care services;
5. Know the business and professional practice management skills in community pharmacies;

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

6. Do patient counselling& provide health screening services to public in community pharmacy;

DIPLOMA SECOND YEAR

PHARMACEUTICS II

1. Understand the professional way of handling the prescription.
2. Know the principle involved in the formulation of various pharmaceutical dosage forms
3. Study the preparation and evaluation of various pharmaceutical dosage forms.
4. Appreciate the importance of good formulation for effectiveness.
5. Do different pharmaceutical calculation involved in the formulation

PHARMACEUTICAL CHEMISTRY II

1. Study of Heterocyclic ring systems and Drugs containing heterocyclic ring systems
2. Know the numbering and IUPAC names, Drugs containing heterocyclic ring systems.
3. Definition, classification and uses of various categories of drugs.
4. Knowledge about brand names and official preparations of different compounds to develop their correlation with pharmaceutical market.

PHARMACOLOGY & TOXICOLOGY

1. Understand the pharmacological actions of different categories of drugs
2. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
3. Appreciate correlation of pharmacology with other biomedical sciences.

PHARMACEUTICAL JURISPRUDENCE

1. Practice the Professional ethics
2. Understand the various concepts of the pharmaceutical legislation in India
3. Know the various parameters in the Drug and Cosmetic Act and rules
4. Know the MTP, DPCO, Patent and design act;

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

5. Understand the labelling requirements and packaging guidelines for drugs and cosmetics;

DRUG STORE AND BUSINESS MANAGEMENT

1. Know the importance of different forms of business organizations,
2. Integration and understanding different sales and managerial functions involved in Pharmacy
3. Understand the different Systems of procurement and inventory control
4. Knowledge and understanding about Drug house management,
5. Know the basic concept of accounts, banking and finance.

HOSPITAL AND CLINICAL PHARMACY

1. Assess the different drug distribution systems
2. Know the professional practice management skills in hospital pharmacies;
3. Provide unbiased drug information to the doctors;
4. Perform the manufacturing practices of various formulations in hospital set up.
5. Know the therapeutic drug monitoring for improved patient care, Pharmacy and therapeutic committee
6. Monitor inventory control

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

M.PHARMACY

PROGRAMME OUTCOME/PROGRAMME SPECIFIC OUTCOME AND COURSE OUTCOME

PROGRAM OUTCOME:The objective of the program is to equip a student in the field of pharmacy with respect to the following attributes: Knowledge, skill and attitude. A detailed list of outcomes in each of these attributes is presented below:

Knowledge

- Understanding the intricacies and the in-depth procedure involved in pharmaceutical product development
- Awareness of the regulatory aspects of drug development
- In-depth study of novel drug delivery systems, polymers and cosmetics
- Computer aided product development
- Exhaustive knowledge of biopharmaceutics and pharmacokinetics

- Understanding the principles of quality assurance and pharmaceutical documentation
- Usage of technology transfer and its implications
- Validation in product development

- Exhaustive knowledge of pharmacological screening, molecular biology, pharmacodynamics and pharmacokinetics
- Understanding pharmacovigilance and the procedure to perform clinical research
- Computer-aided drug design

- Advanced analytical techniques and its applications
- Importance of validation in the analytical process
- Analytical procedures in cosmetics and natural products
  -
- Advanced synthetic methods of medicinal compounds.
- Computer-aided aspects of drug discovery.
- Chemistry of natural products.

Skills

- Development of newer dosage forms and drug delivery systems
- Software-based formulation development process
- Dossier submission

- Pharmaceutical documentation and Standard Operating Procedure writing
- Validation of analytical processes
- Utilization of analytical instruments

- Synthesis of medicinal agents and its characterisation
- Utilization of analytical instruments
- Usage of softwares used in drug developments

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

- Performing simulation-based animal experiments
- Bio-assays and pharmacological screening
- Advanced pharmacodynamics and pharmacokinetics

Attitude

- To spread the pharmaceutical knowledge for better well being of humanity
- To retain professional ethics.
- To maintain a scientific temper
- To be involved in medicinal research that is in dire need by the medical community
- To conform to the rules and regulations in the clinical domain

COURSE OUTCOME

DEPARTMENT OF PHARMACEUTICS

I SEMESTER

Upon completion of the following courses, students shall be able to

MODERN PHARMACEUTICAL ANALYSIS (MPA101T)

- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instrument

DRUG DELIVERY SYSTEM (MPH101T) :

- The various approaches for development of novel drug delivery systems.
- The criteria for selection of drugs and polymers for the development of the formulation and evaluation of Novel drug delivery systems.

MODERN PHARMACEUTICS (MPH102T)

- To understand the Active Pharmaceutical Ingredients and Generic drug Product development
- To learn Industrial Management and GMP Considerations.
- To understand Optimization Techniques & Pilot Plant Scale Up Techniques
- To study Stability Testing, sterilization process & packaging of dosage forms.

REGULATORY AFFAIRS (MPH103T)

- The Concepts of innovator and generic drugs, drug development process
- The Regulatory guidance's and guidelines for filing and approval process
- Preparation of Dossiers and their submission to regulatory agencies in different countries
- Post approval regulatory requirements for actives and drug products
- Submission of global documents in CTD/ eCTD formats
- Clinical trials requirements for approvals for conducting clinical trials
- Pharmacovigilance and process of monitoring in clinical trials.

II SEMESTER

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)(MPH201T)

- The various approaches for development of novel drug delivery systems.
- The criteria for selection of drugs and polymers for the development of NTDS
- The formulation and evaluation of novel drug delivery systems.

ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS (MPH202T)

- The basic concepts in biopharmaceutics and pharmacokinetics.
- The use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
- The critical evaluation of biopharmaceutic studies involving drug product equivalency. The design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
- The potential clinical pharmacokinetic problems and apply basic pharmacokinetic
- The principles to solve them

COMPUTER AIDED DRUG DEVELOPMENT (MPH203T)

- History of Computers in Pharmaceutical Research and Development
- Computational Modelling of Drug Disposition
- Computers in Preclinical Development
- Optimization Techniques in Pharmaceutical Formulation
- Computers in Market Analysis
- Computers in Clinical Development
- Artificial Intelligence (AI) and Robotics
- Computational fluid dynamics (CFD)

COSMETICS AND COSMECEUTICALS (MPH204T)

- The key ingredients used in cosmetics and cosmeceuticals.
- The key building blocks for various formulations.
- The current technologies in the market
- The various key ingredients and basic science to develop cosmetics and cosmeceuticals
- The scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, sensory, stability, and efficacy

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

PHARMACEUTICAL CHEMISTRY

I SEMESTER

ADVANCED ORGANIC CHEMISTRY-1 (MPC101T)

- The principles and applications of retrosynthesis
- The mechanism & applications of various named reactions
- The concept of disconnection to develop synthetic routes for small target molecule.
- The various catalysts used in organic reactions
- The chemistry of heterocyclic compounds.

ADVANCED MEDICINAL CHEMISTRY (MPC102T)

- Different stages of drug discovery
- Role of medicinal chemistry in drug research
- Different techniques for drug discovery
- Various strategies to design and develop new drug like molecules for biological targets
- Peptidomimetics.

CHEMISTRY OF NATURAL PRODUCTS (MPC103T)

- Different types of natural compounds and their chemistry and medicinal importance
- The importance of natural compounds as lead molecules for new drug discovery
- The concept of rDNA technology tool for new drug discovery
- General methods of structural elucidation of compounds of natural origin
- Isolation, purification and characterization of simple chemical constituents from natural source.

II SEMESTER

ADVANCED SPECTRAL ANALYSIS (MPC201T)

- Interpretation of the NMR, Mass and IR spectra of various organic compounds
- Theoretical and practical skills of the hyphenated instruments
- Identification of organic compounds

ADVANCED ORGANIC CHEMISTRY -II(MPC202T)

- The principles and applications of Green chemistry
- The concept of peptide chemistry.
- The various catalysts used in organic reactions
- The concept of stereochemistry and asymmetric synthesis.

COMPUTER AIDED DRUG DESIGN (MPC203T)

- Role of CADD in drug discovery
- Different CADD techniques and their applications
- Various strategies to design and develop new drug like molecules.
- Working with molecular modelling software's to design new drug molecules
- The in silico virtual screening protocols Theory 60 Hrs 1. Introduction to Computer Aided Drug Design.

PHARMACEUTICAL PROCESS CHEMISTRY (MPC204T)

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

- The strategies of scale up process of apis and intermediates
- The various unit operations and various reactions in process chemistry

PHARMACOLOGY

SEMESTER-I

MODERN PHARMACEUTICAL ANALYSIS (MPA101T)

- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instrument

ADVANCED PHARMACOLOGY-I (MPL101T)

- Discuss the pathophysiology and pharmacotherapy of certain diseases
- Explain the mechanism of drug actions at cellular and molecular level
- Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-I (MPL102T)

- Appraise the regulations and ethical requirement for the usage of experimental animals.
- Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals
- Describe the various newer screening methods involved in the drug discovery process
- Appreciate and correlate the preclinical data to humans

CELLULAR AND MOLECULAR PHARMACOLOGY (MPL103T)

- Explain the receptor signal transduction processes.
- Explain the molecular pathways affected by drugs.
- Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
- Demonstrate molecular biology techniques as applicable for pharmacology

SEMESTER-II

ADVANCED PHARMACOLOGY-II (MPL201T)

- Explain the mechanism of drug actions at cellular and molecular level
- Discuss the Pathophysiology and pharmacotherapy of certain diseases
- Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

TOXICOLOGICAL SCREENING METHODS (MPL202T)

- Explain the various types of toxicity studies.
- Appreciate the importance of ethical and regulatory requirements for toxicity studies.
- Demonstrate the practical skills required to conduct the preclinical toxicity studies.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

PRINCIPLES OF DRUG DISCOVERY (MPL203T)

- Explain the various stages of drug discovery.
- Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery
- Explain various targets for drug discovery.
- Explain various lead seeking method and lead optimization
- Appreciate the importance of the role of computer aided drug design in drug discovery

CLINICAL RESEARCH AND PHARMACOVIGILANCE (MPL204T)

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

1. Explain the regulatory requirements for conducting clinical trial
2. Demonstrate the types of clinical trial designs
3. Explain the responsibilities of key players involved in clinical trials
4. Execute safety monitoring, reporting and close-out activities
5. Explain the principles of Pharmacovigilance
6. Detect new adverse drug reactions and their assessment
7. Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance

DEPARTMENT OF PHARMACEUTICAL ANALYSIS

SEMESTER-I

MODERN PHARMACEUTICAL ANALYSIS (MPA101T)

- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instrument

ADVANCED PHARMACEUTICAL ANALYSIS (MPA102T)

- Appropriate analytical skills required for the analytical method development.
- Principles of various reagents used in functional group analysis that renders necessary support in research methodology and demonstrates its application in the practical related problems.
- Analysis of impurities in drugs, residual solvents and stability studies of drugs and biological products.

PHARMACEUTICAL VALIDATION (MPA103T)

- Explain the aspect of validation ← Carryout validation of manufacturing processes
- Apply the knowledge of validation to instruments and equipment's
- Validate the manufacturing facilities

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

FOOD ANALYSIS (MPA104T)

Understand various analytical techniques in the determination of

- Food constituents
  - Food additives
  - Finished food products
  - Pesticides in food
  - Student shall have the knowledge on food regulations and legislations.

SEMESTER-II

ADVANCED INSTRUMENTAL ANALYSIS (MPA201T)

- Interpretation of the NMR, Mass and IR spectra of various organic compounds
- Theoretical and practical skills of the hyphenated instruments
- Identification of organic compounds

MODERN BIO-ANALYTICAL TECHNIQUES (MPA202T)

- Extraction of drugs from biological samples
- Separation of drugs from biological samples using different techniques
- Bioanalytical method validation
- Guidelines for BA/BE studies.
- GCP

QUALITY CONTROL AND QUALITY ASSURANCE (MPA203T)

- To appreciate the importance of documentation
- To understand the scope of quality certifications applicable to Pharmaceutical industries
- To understand the responsibilities of QA & QC departments

COSMETIC ANALYSIS & EVALUATION (MPA204T)

- Determination of physical constants of cosmetic raw materials
- Cosmetic raw materials, additives and their analysis
- Analysis of finished cosmetic products
- Principles of performance evaluation of cosmetic products.

DEPARTMENT OF PHARMACEUTICAL QUALITY ASSURANCE

SEMESTER-I

MODERN PHARMACEUTICAL ANALYSIS (MPA101T)

- The analysis of various drugs in single and combination dosage forms
- Theoretical and practical skills of the instrument

QUALITY MANAGEMENT SYSTEMS (MQA101T)

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

- The importance of quality
- ISO management systems
- Tools for quality improvement
- Analysis of issues in quality
- Quality evaluation of pharmaceuticals
- Stability testing of drug and drug substances
- Statistical approaches for quality

QUALITY CONTROL AND QUALITY ASSURANCE (MQA102T)

- Understand the cGMP aspects in a pharmaceutical industry
- To appreciate the importance of documentation
- To understand the scope of quality certifications applicable to Pharmaceutical industries
- To understand the responsibilities of QA & QC departments

PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER (MQA103T)

- To understand the new product development process
- To understand the necessary information to transfer technology from R&D to actual manufacturing by sorting out various information obtained during R&D
- To elucidate necessary information to transfer technology of existing products between various manufacturing places

SEMESTER-II

HAZARDS AND SAFETY MANAGEMENT (MPA201T)

- Understand about environmental problems among learners.
- Impart basic knowledge about the environment and its allied problems.
- Develop an attitude of concern for the industry environment.
- Ensure safety standards in pharmaceutical industry
- Provide comprehensive knowledge on the safety management
- Empower an ideas to clear mechanism and management in different kinds of hazard management system
- Teach the method of Hazard assessment, procedure, methodology for provide safe industrial atmosphere.

PHARMACEUTICAL VALIDATION (MQA202T)

- The concepts of calibration, qualification and validation
- The qualification of various equipment's and instruments
- Process validation of different dosage forms
- Validation of analytical method for estimation of drugs
- Cleaning validation of equipment's employed in the manufacture of pharmaceuticals

AUDITS AND REGULATORY COMPLIANCE (MPA203T)

- To understand the importance of auditing
- To understand the methodology of auditing

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

- To carry out the audit process
- To prepare the auditing report
- To prepare the check list for auditing

PHARMACEUTICAL MANUFACTURING TECHNOLOGY (MPA204T)

The common practice in the pharmaceutical industry developments, plant layout and production planning

- Will be familiar with the principles and practices of aseptic process technology, non-sterile manufacturing technology and packaging technology.
- Have a better understanding of principles and implementation of Quality by design (QbD) and process analytical technology (PAT) in pharmaceutical manufacturing

SEMESTER-III AND IV

RESEARCH WORK

Upon completion of the course the student may able to understand-

- The research methodology.
- The biostatistical methods.
- To write the review and research articles.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

PHARM.D

PROGRAMME OUTCOMES

1. Promote the rational use of drugs in treatment.
2. Provide unbiased, well-referenced, critically evaluated and up-to-date drug and poison information services on all aspects of drug use to physicians or any other medical practitioner.
3. Monitor, report and manage adverse drug reactions to avoid undesirable effects
4. Provide patient counseling services for safe and effective drug therapy
5. Pursue research in clinical pharmacy related areas to improve health outcomes
6. Perform drug utilization reviews and pharmacoeconomic analysis for better therapeutic effectiveness and to reduce health care costs.
7. Prescription handling and effective hospital pharmacy services

COURSE OUTCOME

PHARM.D I YEAR

Human Anatomy and Physiology

1. Describe the structure (gross and histology) and functions of various organs of the human body;
2. Describe the various homeostatic mechanisms and their imbalances of various systems;
3. Identify the various tissues and organs of the different systems of the human body;
4. Perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes;
5. Appreciate coordinated working pattern of different organs of each system; and
6. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of the human body.

PHARMACEUTICS

1. Know the formulation aspects of different dosage forms;
2. Do different pharmaceutical calculation involved in the formulation;
3. Formulate different types of dosage forms; and
4. Appreciate the importance of good formulation for effectiveness.

MEDICINAL BIOCHEMISTRY

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 -

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

1. Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases;
2. Know the metabolic process of biomolecules in health and illness (metabolic disorders);
3. Understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism;
4. Know the biochemical principles of organ function tests of kidney, liver and endocrine gland; and
5. Do the qualitative analysis and determination of biomolecules in the body fluids.

PHARMACEUTICAL ORGANIC CHEMISTRY

This course is designed to impart a very good knowledge about

1. IUPAC/ Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds;
2. Some important physical properties of organic compounds;
3. 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;
4. Some named organic reactions with mechanisms; and
5. Methods of preparation, test for purity, principle involved in the assay, important medicinal uses of some important organic compounds.

PHARMACEUTICAL INORGANIC CHEMISTRY

1. Understand the principles and procedures for analysis of drugs and also regarding the application of inorganic pharmaceuticals;
2. Know the analysis of the inorganic pharmaceuticals their applications; and
3. Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.

REMEDIAL MATHEMATICS/ BIOLOGY

1. Know Trignometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications;
2. Solve the problems of different types by applying theory; and
3. Appreciate the important applications of mathematics in pharmacy.

PHARM.D II YEAR

PATHOPHYSIOLOGY

1. Describe the etiology and pathogenesis of the selected disease states;
2. Name the signs and symptoms of the diseases; and

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

3. Mention the complications of the diseases.

PHARMACEUTICAL MICROBIOLOGY

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. Do estimation of RNA and DNA and thereby identifying the source;
4. Do cultivation and identification of the microorganisms in the laboratory;
5. Do identification of diseases by performing the diagnostic tests; and
6. Appreciate the behavior of motility and behavioral characteristics of microorganisms.

PHARMACOGNOSY & PHYTOPHARMACEUTICALS

1. Understand the basic principles of cultivation, collection and storage of crude drugs;
2. Know the source, active constituents and uses of crude drugs; and
3. Appreciate the applications of primary and secondary metabolites of the plant.

PHARMACOLOGY – I

1. Understand the pharmacological aspects of drugs falling under the above mentioned chapters;
2. Handle and carry out the animal experiments;
3. Appreciate the importance of pharmacology subject as a basis of therapeutics; and
4. Correlate and apply the knowledge therapeutically.

COMMUNITY PHARMACY

1. Know pharmaceutical care services;
2. Know the business and professional practice management skills in community pharmacies;
3. Do patient counselling & 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; and
6. Appreciate the concept of Rational drug therapy.

PHARMACOTHERAPEUTICS – I

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 individualised 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. Summarise 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 individualised therapeutic plans based on diagnosis; and
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).

PHARM.D III YEAR

PHARMACOLOGY – II

1. Understand the pharmacological aspects of drugs falling under the above mentioned chapters,
2. Carry out the animal experiments confidently,
3. Appreciate the importance of pharmacology subject as a basis of therapeutics, and
4. Correlate and apply the knowledge therapeutically.

PHARMACEUTICAL ANALYSIS

1. Understand the principles of volumetric and electrochemical analysis
2. Carry out various volumetric and electrochemical titrations
3. Develop analytical skills
4. Understand the chromatographic separation and analysis of drugs.
5. Perform quantitative & qualitative analysis of drugs using various analytical instruments.

PHARMACOTHERAPEUTICS – II

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 individualised therapeutic plans based on diagnosis; and
5. 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).

PHARMACEUTICAL JURISPRUDENCE

1. Practice the Professional ethics;
2. Understand the various concepts of the pharmaceutical legislation in India;
3. Know the various parameters in the Drug and Cosmetic Act and rules;
4. Know the Drug policy, DPCO, Patent and design act;
5. Understand the labeling requirements and packaging guidelines for drugs and cosmetics;
6. Be able to understand the concepts of the Dangerous Drugs Act, Pharmacy Act and Excise duties Act; and
7. Other laws as prescribed by the Pharmacy Council of India from time to time including International Laws.

MEDICINAL CHEMISTRY

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 of different class of drugs
4. Study the chemical synthesis of selected drugs.

PHARMACEUTICAL FORMULATIONS

1. Understand the principle involved in formulations of various pharmaceutical dosage forms;
2. Prepare various pharmaceutical formulations;
3. Perform evaluation of pharmaceutical dosage forms; and
4. Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.

PHARMD IV YEAR

PHARMACOTHERAPEUTICS – III

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 individualised 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. To summarize the therapeutic approach to management of these diseases including reference to the latest available evidence;
8. To discuss the controversies in drug therapy;
9. To discuss the preparation of individualised therapeutic plans based on diagnosis; and

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).

HOSPITAL PHARMACY

1. Know various drug distribution methods;
2. Know the professional practice management skills in hospital pharmacies;
3. Provide unbiased drug information to the doctors;
4. Know the manufacturing practices of various formulations in hospital set up;
5. Appreciate the practice based research methods; and
6. Appreciate the stores management and inventory control.

CLINICAL PHARMACY

1. Monitor drug therapy of patient through medication chart review and clinical review;
2. Obtain medication history interview and counsel the patients;
3. Identify and resolve drug related problems;
4. Detect, assess and monitor adverse drug reactions;
5. Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; and
6. Retrieve, analyze, interpret and formulate drug or medical information.

BIOSTATISTICS AND RESEARCH METHODOLOGY

1. Define the principal concepts about Biostatistics.
2. Collect data relating to variable/variables which will be examined and calculate descriptive statistics from these data.
3. Identify distribution form relating to the variable/variability.
4. Apply hypothesis testing via some of the statistical distributions.

BIOPHARMACEUTICS AND PHARMACOKINETICS

1. Understand the basic concepts in biopharmaceutics and pharmacokinetics.
2. Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.
3. Critically evaluate biopharmaceutic studies involving drug product equivalency 4. Design and evaluate dosage regimens of the drugs using pharmacokinetics and biopharmaceutic parameters.
4. Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them.

CLINICAL TOXICOLOGY

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

1. Developing a general working knowledge of the principles and practice of clinical toxicology
2. Demonstrating an understanding of the health implications of toxic exposures and commonly involved chemicals for toxicity
3. Demonstrating and applying an understanding of general toxicology principles and clinical management practice
4. Demonstrating and applying an understanding of the history, assessment, and therapy considerations associated with the management of a toxic exposure
5. Demonstrating and apply an understanding of the characteristics of and treatment guidelines for specific toxic substances
6. Proposing several preventive approaches to reduce unintentional poisonings

PHARM.D V YEAR

CLINICAL RESEARCH

1. Know the new drug development process.
2. Understand the regulatory and ethical requirements.
3. Appreciate and conduct the clinical trials activities
4. Know safety monitoring and reporting in clinical trials
5. Manage the trial coordination process
6. Know the new drug development process.
7. Understand the regulatory and ethical requirements.
8. Appreciate and conduct the clinical trials activities
9. Know safety monitoring and reporting in clinical trials.

PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS

1. Describe the methods used in Pharmacoepidemiology
2. Demonstrate competency in the design, conduct and evaluation of Pharmacoepidemiology studies.
3. Describe the methods used in Pharmacoeconomic analysis.
4. Demonstrate competency in the design, conduct and evaluation of Pharmacoeconomic studies.

CLINICAL PHARMACOKINETICS AND PHARMACOTHERAPEUTIC DRUG MONITORING

1. Ability to apply the concepts of Pharmacokinetics to individualize the drug dosage regimen in clinical settings.
2. Ability to design a dosage regimen of a drug based on its route of administration
3. Ability to design and implement pharmacokinetics services such as Intravenous to Oral conversion of dosage regimens Therapeutic Drug Monitoring Services

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035

4. Broader understanding about the significance of altered pharmacokinetics, Pharmacogenetics and Pharmacometrics.
5. Ability to adjust the dosage regimen for patients with renal / hepatic impairments.
6. Ability to assess the drug interaction issues in the clinical settings.

PRINCIPAL
Krupanidhi College of Pharmacy
Chikkabellandur, Carmelaram Post,
Varthur Hobli, Bangalore - 560 035