M.S. Ramaiah University of Applied Sciences

New BEL Road, MSR Nagar, Bangalore – 560054

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

PO, PSO, PEO & CO

Programme: Pharm. D. (Doctor of Pharmacy)

Programme Code: 010

Programme Outcome (PO)
Programme Specific Outcome (PSO)
Programme Educational Objectives (PEO)
Course Outcomes (CO)

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Faculty of Pharmacy
M.S. Ramaiah University of Applied Sciences
Bangalore-560054

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Approved in 23rd ACM (Resolution 23.05) held on 15th July 2021

Faculty of Pharmacy (FPH)

Programme Name: Pharm. D. (Doctor of Pharmacy)

Programme Outcomes (POs)

Pharm. D. graduates will be able to:

PO-1. Pharmacy Knowledge: Possess knowledge and comprehension of the core and basicknowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.

PO-2. Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

PO-3. Problem analysis: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall makedefensible decisions.

PO-4. Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding ofthe limitations.

PO-5. Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well- being.

PO-6. Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

PO-7. Pharmaceutical Ethics: Honor personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural andpersonal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

PO-8. Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, makeeffective presentations and documentation, and give and receive clear instructions.

PO-9. The Pharmacist and society: Apply reasoning informed by the contextual knowledgeto assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

PO-10. Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO-11. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self- assess and use feedback effectively from others toidentify learning needs and to satisfy these needs on an ongoing basis.

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Programme Specific Outcomes (PSOs)

At the end of the Pharm. D. Program, the graduate will be able to:

PSO-1. Apply the basic knowledge acquired in life science, chemistry, phytopharmaceuticals, drug delivery, pharmacology, toxicology to ensurerationalisation of drug therapy, identify adverse drug reactions, suggest alternative drug therapy in case of prescription errors, and outline the guidelines used for specific diseases

PSO-2. Understand specific pharmacoepidemiology and pharmacoeconomic calculations toselect cost effective therapy, resolve medication errors, comprehend pharmacokinetic variations, employ clinical interventions by suggesting suitable pharmacotherapy and patient specific pharmaceutical formulations to devise the best evidence-based drug therapy

PSO-3. Acquire knowledge of biostatistics, clinical research, professional ethics, pharmaceutical legislation, leadership qualities and strive for the betterment of organization, environment and society, conduct community and clinical pharmacist services through pharmaceutical care

PSO-4. Adapt to the chosen profession by continuous upgrading of knowledge and understanding through life-long learning

Program Educational Objectives (PEOs)

The objectives of the Pharm. D. Program are to:

PEO-1. Educate the students on rational use of drugs for an appropriate treatment, drug utilization reviews and patient counselling to focus their attention in the fields of hospital and community pharmacy and guiding them to initiate the career in the hospitals after their graduation

PEO-2. Create research interest in the minds of students so that willingly they may take up research as a career with passion in the field of clinical research and clinical data management in the research organizations

PEO-3. Provide quality pharmacy education to the students on drug and poison informationservices, monitor, report and manage adverse drug reactions which help them get tuned to work in different research areas such as pharmacoeconomics, pharmaco- epidemiology, and pharmacovigilance

PEO-4. Inculcate strong human values and social, interpersonal and leadership skills required for professional success in evolving global professional environments

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Course Outcomes (COs)

Course Title & Code: Human Anatomy and Physiology (Theory) (PDC101)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the structure (gross and histology) and functions of various organs of the human body
- **CO-2.** Discuss the various homeostatic mechanisms and their imbalances of various systems
- **CO-3.** Identify the various tissues and organs of the different systems of the human body
- **CO-4.** Recognize coordinated working pattern of different organs of each systems
- **CO-5.** Summarize the interlinked mechanisms in the maintenance of normal functioning of human body

Course Outcomes (COs)

Course Title & Code: Pharmaceutics (Theory) (PDC102)

After the successful completion of this course, the student will be able to:

- **CO-1.** Summarize the history of the profession of pharmacy and the professional way of handlingprescription
- **CO-2.** Identify and select appropriate dosage forms according to route of administration
- **CO-3.** Solve pharmaceutical calculations for compounding dosage forms
- **CO-4.** Design and develop pharmaceutical dosage forms with appropriate ingredients, suitable labels and apt storage conditions
- **CO-5.** Analyze the instabilities observed in formulations and suggest suitable remedial measures to overcome the same
- **CO-6.** Propose evaluation tests for dosage forms according to official standards

Course Outcomes (COs)

Course Title & Code: Medicinal Biochemistry (Theory) (PDC103)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the structure and functions of cell organelles
- **CO-2.** Outline the concepts of biological oxidation and bio energetics
- **CO-3.** Explain the metabolism of carbohydrates, lipids and proteins
- **CO-4.** Elaborate the role of catalytic activity of enzymes and importance of isoenzymes in diagnosis of disease
- **CO-5.** Explain the principles, significance and methods of different biochemical tests and immuno assays
- **CO-6.** Discuss the metabolism of nucleotides and concepts of replication, genetic code and mutation of DNA

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Course Outcomes (COs)

Course Title & Code: Pharmaceutical Organic Chemistry (Theory) (PDC104)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the physical properties of organic compounds
- **CO-2.** Summarize the studies on some important official organic compounds

CO-3. Identify the structures of a given organic compound and give the nomenclature
CO-4. Explain the mechanisms involved in various organic reactions
CO-5. Discuss the reactivity and orientation of organic reactions
CO-6. Predict the products obtained through simple organic reactions

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Inorganic Chemistry (Theory) (PDC105)

After the successful completion of this course, the student will be able to:

CO-1. Summarise the basic concepts and principles of specified titrimetric methods, along with itsapplications in pharmaceutical analysis
CO-2. Understand the monographs of inorganic drugs and pharmaceuticals as per Pharmacopoeia alongwith the history of Pharmacopoeia
CO-3. Knowledge about the effects of impurities, sources of impurities in inorganic drugs andpharmaceuticals and to discuss the principles and methodology of limit test
CO-4. Understand the different classes of inorganic pharmaceuticals along with its
CO-5. Outline methods to prepare, discuss the principles and methodology of assay for inorganicpharmaceuticals along with its storage and medicinal uses
CO-6. Apply knowledge on radiopharmaceuticals

Course Outcomes (COs)

Course Title & Code: Remedial Mathematics (Theory) **(**PDA106T**)**

After the successful completion of this course, the student will be able to:

CO-1. Explain the principles of matrix algebra, determinants, Trigonometry, Analytical Geometry,Differential Calculus, Integral Calculus, Differential Equations and Laplace Transforms
CO-2. State and explain the important theorems such as Cayley-Hamilton Theorem, Adjoint Cramer's rule and Leibnitz Theorem
CO-3. Identify the appropriate standard form for a given differential equation
CO-4. Solve simple and complex mathematical problems associated with on trigonometry and Analytical geometry
CO-5. Solve simple mathematical problems associated with on matrix algebra, differential and integral calculus as well as Laplace Transforms
CO-6. Solve complex mathematical problems associated with on matrix algebra, differential equations, differential and integral calculus as well as Laplace Transforms

Course Outcomes (COs)

Course Title & Code: Remedial Biology (Theory) (PDC107)

After the successful completion of this course, the student will be able to:

CO-1. Explain the classification of plants, plant cell and its organelles, types of tissues and their functions
CO-2. Explain physiological aspects of plants
CO-3. Outline the taxonomical characters of various families

CO-4. Identify plant/plant parts based on its morphological and microscopical characters
CO-5. Elaborate on the modifications of stem, root and leaf
CO-6. Discuss structure and life history of parasites/insects

Course Outcomes (COs)

Course Title & Code: Human Anatomy and Physiology (Practical) (PDL108)

After the successful completion of this course, the student will be able to:

CO-1. Illustrate different types of Tissues and explain various Anatomical models
CO-2. Identify the bones of skeletal system
CO-3. Determine Blood cell count, Hemoglobin, Blood grouping, ESR, Bleeding time and Clotting time
CO-4. Record Blood Pressure, Pulse rate, Body temperature
CO-5. Identify family planning devices and conduct Pregnancy diagnosis test
CO-6. Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Pharmaceutics (Practical) (PDL109)

After the successful completion of this course, the student will be able to:

CO-1. Formulate various solid and liquid dosage forms
CO-2. Demonstrate different techniques involved in formulation
CO-3. Identify and apply the suitable remedial measures to solve instabilities observed in formulations
CO-4. Prepare appropriate labels for dosage forms
CO-5. Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Medicinal Biochemistry (Practical) (PDL110)

After the successful completion of this course, the student will be able to:

CO-1. Interpret the metabolic disorders based on laboratory values
CO-2. Determine the biomolecules by qualitative and quantitative analysis of urine and bloodsamples
CO-3. Interpret the lipid profile, liver and kidney function tests
CO-4. Estimate various electrolytes in urine and blood samples
CO-5. Choose and handle appropriate standard instruments for sample analysis
CO-6. Construct planned experiments and prepare laboratory report in a standard format

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M.S. Ramaiah University of Applied Sciences
Bangalore-560054

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Course Outcomes (COs)

Course Title & Code: Pharmaceutical Organic Chemistry (Practical) (PDL111)

After the successful completion of this course, the student will be able to:

CO-1. Apply basic principles and synthesize simple organic compounds by different organic reactions

CO-2. Utilize stereo models and explain the structural aspects of organic compounds
CO-3. Test for extra elements (N,S and X) present in the compounds
CO-4. Identify various classes of organic compounds by systematic qualitative analysis
CO-5. Make use of basic principles to prepare suitable solid derivatives from organic compounds

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Inorganic Chemistry (Practical) (PDL112)

After the successful completion of this course, the student will be able to:

CO-1. Identify the impurities in given inorganic compounds by performing limit tests
CO-2. Analyze the purity of compound quantitatively by performing assays
CO-3. Recommend methods to prepare inorganic pharmaceuticals
CO-4. Demonstrate identification tests as per Indian Pharmacopoeia
CO-5. Inspect the impurities qualitatively by performing test for purity

Course Outcomes (COs)

Course Title & Code: Remedial Biology (Practical) (PDL113)

After the successful completion of this course, the student will be able to:

CO-1. Identify cell wall constituents and cell inclusions
CO-2. Identify the crude drugs by its morphological characteristics and study the anatomical characters by preparing slides
CO-3. Perform experiments related to plant physiology
CO-4. Explain different parts of frog digestive system
CO-5. Conduct planned experiments and prepare laboratory reports in a standard format

Course Outcomes (COs)

Course Title & Code: Pathophysiology (Theory) (PDC214)

After the successful completion of this course, the student will be able to:

CO-1. Explain the pathogenesis and morphology of reversible and irreversible cell injury; enumerate variouslipoproteins and describe lipoprotein disorders
CO-2. Illustrate events involved in acute and chronic inflammation
CO-3. Recall the biological significance of various hypersensitivity disorders
CO-4. Summarize the mechanisms involved in autoimmune diseases and allograft rejection
CO-5. Discuss the etiopathogenesis of selected diseases
CO-6. Elaborate the general biology of cancer, mechanism of shock and effects of radiation exposure

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Microbiology (Theory) (PDC215)

After the successful completion of this course, the student will be able to:

CO-1. Outline the history and developments in the field of microbiology
CO-2. Discuss techniques for cultivation, isolation, identification and classification of microbes

CO-3. Explain the principles of sterilization and disinfection and choose appropriate techniques for control of microbes

CO-4. Explain the principles of sterility testing and recommend appropriate methods for the evaluation and standardization of antimicrobials

CO-5. Discuss the concepts of immunology and interpolate the same in disease diagnosis

Course Outcomes (COs)

Course Title & Code: Pharmacognosy & Phytopharmaceuticals (Theory) (PDC216)

After the successful completion of this course, the student will be able to:

CO-1. Define Pharmacognosy and outline its evolution

CO-2. Explain the classification of crude drugs and discuss their primary and secondary

CO-3. Discuss various parameters related to cultivation, collection, processing and storage of crudedrugs

CO-4. Analyse morphological and microscopical characters of crude drugs

CO-5. Discuss the production, evaluation, uses and adulterants of crude drugs

CO-6. Identify the market samples of drugs containing proteins, carbohydrates and lipids

Course Outcomes (COs)

Course Title & Code: Pharmacology I (Theory) (PDC217)

After the successful completion of this course, the student will be able to:

CO-1. Explain pharmacokinetics and pharmacodynamics of a drug

CO-2. Discuss the factors modifying drug action

CO-3. Identify drug interactions and detect adverse drug reactions

CO-4. Classify and explain the pharmacology of drugs acting on various systems

CO-5. Apply the basics of pre-clinical and clinical evaluations in the development of new drugs

Course Outcomes (COs)

Course Title & Code: Community Pharmacy (Theory) (PDC218)

After the successful completion of this course, the student will be able to:

CO-1. Discuss the roles and responsibilities of community pharmacist

CO-2. Outline the layout and infrastructure requirements for community pharmacy

CO-3. Identify the need of inventory control and discuss the various methods

CO-4. Discuss the factors affecting medication adherence

CO-5. Take part in patient counseling

CO-6. Apply the concepts of health education and screening services in community Pharmacy

Course Outcomes (COs)

Course Title & Code: Pharmacotherapeutics I (Theory) (PDC219)

After the successful completion of this course, the student will be able to:

CO-1. Summarize the etiopathogenesis of selected diseases

CO-2. Explain the general prescribing guidelines and rational use of drugs

CO-3. Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy

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M.S. Ramaiah University of Applied Sciences
Bangalore-560054

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CO-4. Design individualized therapeutic plans based on diagnosis
CO-5. Identify the role of pharmacist in essential and rational drug use
CO-6. Recommend suitable prescribing guidelines

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Microbiology (Practical) (PDL220)

After the successful completion of this course, the student will be able to:

CO-1. Demonstrate aseptic techniques, prepare culture media and handle laboratory equipment
CO-2. Identify microbes using staining and biochemical techniques
CO-3. Illustrate techniques for bacterial isolation
CO-4. Evaluate efficacy of antimicrobial agents and carry out sterility testing of pharmaceutical products
CO-5. Explain principle involved in certain diagnostic tests
CO-6. Demonstrate aseptic techniques, prepare culture media and handle laboratory equipment

Course Outcomes (COs)

Course Title & Code: Pharmacognosy & Phytopharmaceuticals (Practical) PDL221)

After the successful completion of this course, the student will be able to:

CO-1. Identify cell wall constituents and cell inclusions
CO-2. Identify the crude drugs by its morphological, anatomical and powder characters
CO-3. Perform chemical tests to identify unorganized crude drugs
CO-4. Analyze lipids by quantitative parameters
CO-5. Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Pharmacotherapeutics - I (Practical) (PDL222)

After the successful completion of this course, the student will be able to:

CO-1. Identify drug interactions and rationalize the prescription
CO-2. Discuss the therapeutic approach to management of selected diseases
CO-3. Prepare individualized therapeutic plans based on diagnosis
CO-4. Take part in patient counseling
CO-5. Plan and conduct experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Pharmacology II (Theory) (PDC323)

After the successful completion of this course, the student will be able to:

CO-1. Discuss the pharmacological aspects of drugs acting on blood and renal System
CO-2. Discuss the pharmacological aspects of chemotherapeutic agents used in various diseases
CO-3. Explain the pharmacology of immunosuppresants and principles of animal toxicology
CO-4. Illustrate the chromosome structure and DNA replication
CO-5. Recognize the fundamentals and importance of cell biology in cell signaling pathways
CO-6. Analyze the principles and processes of Recombinant DNA technology

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Faculty of Pharmacy
M.S. Ramaiah University of Applied Sciences
Bangalore-560054

M.S. Ramaiah University of Applied Sciences Bangalore - 560054

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Analysis (Theory) (PDC324)

After the successful completion of this course, the student will be able to:

- **CO-1.** Theory of electronic, atomic and molecular spectra, fundamental laws of photometry
- **CO-2.** Describe the fundamental principles and applications of UV-visible, IR, NMR and Mass spectroscopy,Flame photometry, Atomic absorption spectroscopy, Nephelo-turbidimetry and Fluorimetry
- **CO-3.** Summarize the theoretical aspects and applications of Chromatographic and Electrophoresistechniques, electrometric methods and Thermal analysis
- **CO-4.** Elaborate on the working of modern analytical instruments
- **CO-5.** Discuss the concepts of Total Quality management, Quality assurance and Quality validation methods

Course Outcomes (COs)

Course Title & Code: Pharmacotherapeutics II (Theory) (PDC325)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the etiopathogenesis of selected infectious diseases, musculoskeletal and
- **CO-2.** Elaborate the principles of cancer therapy and dermatological disorders
- **CO-3.** Summarize the patient-specific parameters relevant in initiating and monitoring drug therapy and adverse effects
- **CO-4.** Plan the therapeutic approach in the management of selected diseases and controversies in drug therapy
- **CO-5.** Design individualized therapeutic plans based on diagnosis
- **CO-6.** Identify the role of pharmacist in essential and rational drug use

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Jurisprudence (Theory) (PDC326)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the evolution of pharmacy as a profession in India and emergence of regulatory bodies
- **CO-2.** Discuss the importance of code of pharmaceutical ethics
- **CO-3.** Recognize the provisions of various acts pertaining to drugs and cosmetics
- **CO-4.** Explain the latest amendments with respect to New Drug policy, DPCO and Patent and designact
- **CO-5.** Discuss the concepts of price fixation of pharmaceutical products
- **CO-6.** Outline the concepts of Narcotic and Psychotropic Substances Act, Pharmacy Act and Exciseduties Act

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Bangalore-560054

M.S. Ramaiah University of Applied Sciences * Bangalore - 560054 *

Course Outcomes (COs)

Course Title & Code: Medicinal Chemistry (Theory) (PDC327)

After the successful completion of this course, the student will be able to:

- **CO-1.** Discuss the relationship between the structures of medicinal compounds with their biologicalactivity
- **CO-2.** Explain the concept of rational drug design including combinatorial chemistry and computeraided drug design
- **CO-3.** Identify the structures of a given medicinal compound and give the nomenclature
- **CO-4.** Synthesize drug molecules using available synthetic and new path ways
- **CO-5.** Explain the mode of action, mode resistance, therapeutic uses and side effects of drugs

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Formulations (Theory) (PDC328)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the significance of formulation and evaluation of conventional and novel pharmaceutical dosage forms
- **CO-2.** Discuss formulation additives for conventional and novel pharmaceutical dosage forms
- **CO-3.** Recommend suitable measures for stability of the dosage forms
- **CO-4.** Elaborate the manufacturing methods of solid, semisolid, parenteral and ophthalmic products
- **CO-5.** Evaluate different dosage forms with appropriate quality control test for a given drug
- **CO-6.** Select suitable packaging material for a dosage form of a given drug

Course Outcomes (COs)

Course Title & Code: Pharmacology II (Practical) (PDL329)

After the successful completion of this course, the student will be able to:

- **CO-1.** Demonstrate intraperitoneal and intramuscular routes of administration of drugs in animals and describedifferent anaesthetics used in laboratory animals
- **CO-2.** Identify and select laboratory appliances used in experimental pharmacology
- **CO-3.** Recommend the physiological salt solution for different isolated tissue preparations
- **CO-4.** Perform a bioassay procedure and create a Dose Response Curve
- **CO-5.** Demonstrate the screening of a drug for CNS activity
- **CO-6.** Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Analysis (Practical) (PDL330)

After the successful completion of this course, the student will be able to:

- **CO-1.** Operate instruments such as UV-visible spectrometer, flame photometer
- **CO-2.** Identify the components of a mixture by using separation techniques of chromatography
- **CO-3.** Estimate the quantity of a drug/sample in a given mixture or solution
- **CO-4.** Analyse the given sample using fluorimetric and nepheloturbidimetric techniques
- **CO-5.** Conduct planned experiments and prepare laboratory report in a standard format

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Dean
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M. S. Ramaiah University of Applied Sciences
Bangalore-560054

Course Outcomes (COs)

Course Title & Code: Pharmacotherapeutics - II (Practical) (PDL331)

After the successful completion of this course, the student will be able to:

- **CO-1.** Identify drug interactions and rationalize the prescription
- **CO-2.** Discuss therapeutic approaches to manage selected diseases
- **CO-3.** Develop individualized therapeutic plans based on diagnosis
- **CO-4.** Take part in patient counseling
- **CO-5.** Plan and conduct experiments and prepare laboratory reports in a standard format

Course Outcomes (COs)

Course Title & Code: Medicinal Chemistry (Practical) (PDL332)

After the successful completion of this course, the student will be able to:

- **CO-1.** Synthesis compounds of medicinal interest
- **CO-2.** Conduct monograph analysis of the pharmaceutical compounds
- **CO-3.** Determine the amount of drug present in an unknown solution
- **CO-4.** Estimate the purity of drugs by performing assays
- **CO-5.** Determine partition coefficient and dissociation constant of a given compound
- **CO-6.** Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Pharmaceutical Formulations (Practical) (PDL333)

After the successful completion of this course, the student will be able to:

- **CO-1.** Prepare formulations of different dosage forms as per the batch formula
- **CO-2.** Make use of different equipment's and instruments used in development of dosage forms
- **CO-3.** Select suitable packaging container for a dosage form
- **CO-4.** Evaluate different dosage forms by performing quality control tests
- **CO-5.** Formulate cosmetics such as lipstick, cold cream and shampoo
- **CO-6.** Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Pharmacotherapeutics III (Theory) (PDC434)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the etiopathogenesis of selected gastrointestinal, hematological, neurological and psychiatric diseases
- **CO-2.** Discuss the principles of evidence-based therapy and pain management
- **CO-3.** Identify the patient-specific parameters relevant in initiating and monitoring drugtherapy and adverse effects
- **CO-4.** Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy
- **CO-5.** Develop individualized therapeutic plans based on diagnosis
- **CO-6.** Identify the role of pharmacist in essential and rational drug use

Dean
Faculty of Pharmacy
M.S. Ramaiah University of Applied Sciences
Bangalore-560054

M.S. Ramaiah University of Applied Sciences * Bangalore - 560054 *

Course Outcomes (COs)

Course Title & Code: Hospital Pharmacy (Theory) (PDC435)

After the successful completion of this course, the student will be able to:

- **CO-1.** Discuss the roles and responsibilities of hospital pharmacist, hospital drug policies andguidelines for hospital pharmacy
- **CO-2.** Discuss various drug distribution methods in a hospital pharmacy
- **CO-3.** Apply various methods of inventory control
- **CO-4.** Elaborate on formulation of various pharmaceutical preparations
- **CO-5.** Compile information for a newsletter to provide continuous education and awareness
- **CO-6.** Explain handling and packaging of radiopharmaceuticals

Course Outcomes (COs)

Course Title & Code: Clinical Pharmacy (Theory) (PDC436)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the roles and responsibilities of clinical pharmacist
- **CO-2.** Analyze and interpret the laboratory test results for clinical diagnosis
- **CO-3.** Conduct interview to elicit medication history and perform patient counseling
- **CO-4.** Identify, monitor, assess, manage, prevent, document and report suspectedadverse drugreactions
- **CO-5.** Provide drug and poison information through critical analysis
- **CO-6.** Recognize the potential sources of medication errors and act for its prevention

Course Outcomes (COs)

Course Title & Code: Biostatistics and Research Methodology (Theory) (PDC437)

After the successful completion of this course, the student will be able to:

- **CO-1.** Recognize the importance of biostatistics in pharmacy
- **CO-2.** Explain the importance of research methods in the design of Pharmacoepidemiological study
- **CO-3.** Discuss the methods of collection of data and its analysis and interpretation
- **CO-4.** Identify appropriate statistical methods for data analysis
- **CO-5.** Discuss and evaluate various software for statistical analysis of data
- **CO-6.** Explain the various methods of testing hypothesis

Course Outcomes (COs)

Course Title & Code: Biopharmaceutics & Pharmacokinetics (Theory) (PDC438)

After the successful completion of this course, the student will be able to:

- **CO-1.** Summarize the basic principles of biopharmaceutics and factors affecting them
- **CO-2.** Identify different compartment models of pharmacokinetics and compare them
- **CO-3.** Compare different dosage forms and examine bioavailability – bioequivalence Relationships
- **CO-4.** Solve for obtaining clinical parameters and predict the pharmacological response

Faculty of Pharmacy
M.S. Ramaiah University of Applied Sciences
Bangalore-560054

M.S. Ramaiah University of Applied Sciences * Bangalore-560054 *

Course Outcomes (COs)

Course Title & Code: Clinical Toxicology (Theory) (PDC439)

After the successful completion of this course, the student will be able to:

- **CO-1.** Describe the mechanism of action of common poisons and antidotes
- **CO-2.** Detect and differentiate acute and chronic poisoning by clinical symptoms
- **CO-3.** Select appropriate laboratory tests to identify and determine the severity of poisoning
- **CO-4.** Detect signs and symptoms of drug abuse and suggest suitable remedial measures
- **CO-5.** Recommend the standard procedures to deal with cases of poisoning

Course Outcomes (COs)

Course Title & Code: Pharmacotherapeutics - III (Practical) (PDL440)

After the successful completion of this course, the student will be able to:

- **CO-1.** Identify drug interactions and rationalize the prescription
- **CO-2.** Discuss the therapeutic approach to management of selected diseases
- **CO-3.** Prepare individualized therapeutic plans based on diagnosis
- **CO-4.** Conduct patient counseling
- **CO-5.** Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Hospital Pharmacy (Practical) (PDL441)

After the successful completion of this course, the student will be able to:

- **CO-1.** Analyze prescriptions for drug interaction
- **CO-2.** Formulate and prepare parenteral formulations and powders
- **CO-3.** Perform inventory analysis
- **CO-4.** Answer drug information queries through literature search
- **CO-5.** Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Clinical Pharmacy (Practical) (PDL442)

After the successful completion of this course, the student will be able to:

- **CO-1.** Assess prescriptions for drug interaction and answer drug information query
- **CO-2.** Perform patient counseling on medication and conduct medication history interview
- **CO-3.** Analyse and interpret the data obtained through laboratory tests
- **CO-4.** Conduct planned experiments and prepare laboratory report in a standard format

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M.S. Ramaiah University of Applied Sciences
Bangalore-560054

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Course Outcomes (COs)

Course Title & Code: Biopharmaceutics and Pharmacokinetics (Practical) (PDL443)

After the successful completion of this course, the student will be able to:

- **CO-1.** Compare the in-vitro drug release profile of different marketed products
- **CO-2.** Perform the solubility enhancement techniques for improvement of drug release of poorlywater soluble drugs
- **CO-3.** Estimate the bioavailability (absolute and relative) and bioequivalence from the given clinicaldata
- **CO-4.** Calculate the drug content in blood sample using Area Under Curve approach
- **CO-5.** Calculate and interpret various pharmacokinetic parameters from the given clinical data
- **CO-6.** Conduct planned experiments and prepare laboratory report in a standard format

Course Outcomes (COs)

Course Title & Code: Clinical Research (Theory) PDC544)

After the successful completion of this course, the student will be able to:

- **CO-1.** Discuss the Pharmacological and Toxicological considerations in process ofdevelopment of new drugs
- **CO-2.** Recall the principles and phases in clinical trial of drug
- **CO-3.** Explain the guidelines for ethics and safe monitoring in clinical trial of a drug
- **CO-4.** Design the documents of clinical trial
- **CO-5.** Distinguish the guidelines of national and international regulatory bodies for clinical trial
- **CO-6.** Identify the roles and obligations of an Investigator, Sponsor and Institutional ReviewBoard

Course Outcomes (COs)

Course Title & Code: Pharmacoepidemiology and Pharmacoeconomics (Theory) (PDC544)

After the successful completion of this course, the student will be able to:

- **CO-1.** Discuss the scope, need, origin and evaluation of Pharmacoepidemiology
- **CO-2.** Explain the importance of Measurement of outcomes in Pharmacoepidemiology
- **CO-3.** Recommend suitable method for measuring the outcome of Pharmacoepidemiology fora disease
- **CO-4.** Suggest an appropriate Pharmacoepidemiological method for a given drug and addressthe risks associated with Pharmacoepidemiological study
- **CO-5.** Discuss the basic principles, role and relevance of Pharmacoeconomics in thedevelopment of a new drug
- **CO-6.** Identify and justify an appropriate evaluation method for Pharmacoeconomics study of

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Course Outcomes (COs)

Course Title & Code Clinical Pharmacokinetics and Pharmacotherapeutic Drug Monitoring (Theory) (PDC546)

After the successful completion of this course, the student will be able to:

- **CO-1.** Discuss the pharmacokinetic principles to individualize drug therapy in patient care situations
- **CO-2.** Determine dose, dosing intervals and dosage adjustments of a drug for a given patient
- **CO-3.** Apply the principles of pharmacokinetics to analyze and predict drug interactions
- **CO-4.** Design protocols for TDM of drugs for selected diseases
- **CO-5.** Discuss the concept of genetic polymorphism in metabolism, transport and target of a drug

Course Outcomes (COs)

Course Title & Code: Clerkship (PDN547)

After the successful completion of this course, the student will be able to:

- **CO-1.** Discuss the role of Pharmacist in clinical pharmacy services
- **CO-2.** Demonstrate the skills of a clinical Pharmacist
- **CO-3.** Discuss the available therapeutic options in the management of diseases
- **CO-4.** Prepare a pharmaceutical care plan for a given case
- **CO-5.** Detect, Interpret and report medication errors and drug interactions

Course Outcomes (COs)

Course Title & Code: Project (PDP548)

After the successful completion of this course, the student will be able to:

- **CO-1.** Address a problem related to Pharmacy practice in hospital, community service or clinical set up with a wider perspective and generality
- **CO-2.** Define the problem to be addressed and translate it into a statement of aim, objectives, scope and plan for the project
- **CO-3.** Carry out and report an information survey and take account of findings in executing project
- **CO-4.** Evaluate, select and apply relevant theories and techniques from the full range of courses studied using conceptual models and frameworks to enhance depth of understanding
- **CO-5.** Select appropriate methodology for investigative work, taking into account the pros and cons of the alternatives available and develop solution proposals based on reasoned judgement
- **CO-6.** Present a coherent, logically argued, fully referenced report and engage in a professional

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Course Outcomes (COs)

Course Title & Code: Internship (PDI649)

After the successful completion of this course, the student will be able to:

- **CO-1.** Explain the pathophysiology of disease states and the rationale for drug therapy
- **CO-2.** Discuss the available therapeutic options to provide patient care in co-operation with patients, prescribers, and other members of an inter-professional health care team
- **CO-3.** Identify, manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers
- **CO-4.** Analyse the therapeutic approaches to promote health improvement, wellness, and disease prevention
- **CO-5.** Demonstrate skills in monitoring of the National Health Programmes and schemes
- **CO-6.** Develop leadership qualities and communication skills to function effectively as amember of the health care team

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