



# JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

(Approved by Tamil Nadu Govt. & Pharmacy Council of India - New Delhi, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai )  
Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

## COURSE OUTCOMES (COs)

The college meticulously outlines the learning goals for its programs and courses. To disseminate this information, the institution employs various strategies. Hard copies of syllabi and learning outcomes are conveniently accessible within departments. Moreover, Program and Course Learning Outcomes adorn the walls outside each department, offering a visible reference. Additionally, the institution maintains soft copies of program curricula and learning objectives on its website for easy access. The significance of these learning outcomes has been a recurring topic in both IQAC and College Committee meetings, fostering discussions among teachers. Further reinforcing this understanding, tutorial sessions actively engage students, ensuring they grasp the same learning objectives discussed in these meetings. Overall, the college employs a multi-faceted approach to ensure comprehensive awareness of the learning outcomes among both educators and students.

## PROGRAM OUTCOME (POs)

**PO-1. Pharmacy Expertise:** The comprehensive knowledge required for pharmacy graduates include biomedical sciences, pharmaceutical sciences, behavioral and administrative pharmacy sciences, along with expertise in manufacturing practices. Understanding biomedical and pharmaceutical principles is pivotal within this domain.

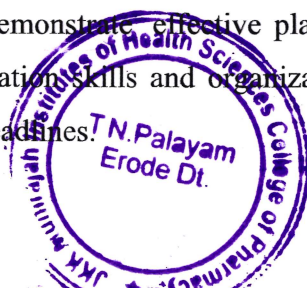
**PO-2. Medication Expertise:** Demonstrate comprehensive knowledge of drugs, including their mechanisms, interactions, and therapeutic uses.

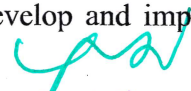
**PO-3. Precision in Dispensing:** Ensure meticulous and safe medication dispensing through mastery of dosage calculations and prescription handling.

**PO-4. Community Health Engagement:** Engage actively in community health initiatives, advocating for medication safety, disease prevention, and public health education.

**PO-5. Problem Analysis:** Apply scientific inquiry principles by employing analytical and critical thinking to address challenges and make decisions in your routine professional tasks. Systematically seek, evaluate, and implement information to arrive at sound and justified conclusions.

**PO-6. 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.



  
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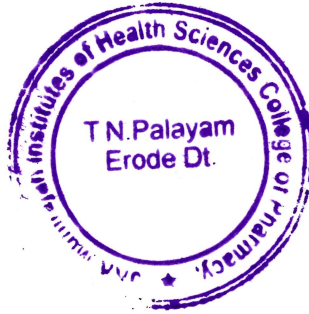
**PO-7. Professional Identity:** Comprehend, evaluate, and articulate the significance of their professional positions within society, such as healthcare providers, advocates for well-being, educators, managers, employers, and employees.

**PO-8. Research and Evidence-Based Practice:** Cultivate robust research skills to contribute to advancements in pharmaceutical sciences and evidence-based practice.

**PO-9. Innovation and Technology Integration:** Utilize advanced technologies to improve pharmacy services, streamline operations, and elevate the quality of patient care.

**PO-10. Effective Pharmacy Management:** Attain competence in overseeing pharmacy operations, handling finances, and cultivating entrepreneurial abilities essential for a prosperous career in pharmacy practice

**PO-11. Interdisciplinary Collaboration:** Efficiently collaborate within healthcare teams to offer comprehensive and holistic patient care through seamless teamwork and coordination.



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**ACADEMIC YEAR 2022- 2023**

**PROGRAMME – B. PHARM**

**YEAR: I**

**SEMESTER - I**

**REGULATION: 2014**

**COURSE NAME: Human Anatomy and Physiology I**

**COURSE CODE: BP101T**

CO - 1	Identify common vocabulary, cell structure and function, and the histology of various tissues and organs of various human body systems.
CO - 2	Understand the concepts and knowledge of gross anatomy, and physiology related to the integumentary, skeletal, muscular and its articulation.
CO - 3	Apply concepts of nervous system and its coordination.
CO - 4	Analyse the sense organs mechanism and their disorders.
CO - 5	Classify and identify principal hormones and their functions.

**COURSE NAME: Pharmaceutical Analysis I**

**COURSE CODE: BP102T**

CO - 1	Develop the ideas with the fundamentals of analytical chemistry.
CO - 2	Construct the fundamental methodology to prepare different strength of solutions and can Predict the sources of Errors.
CO - 3	Develop Knowledge on Principal, Classification and applications of different types of titrimetric methods.
CO - 4	Develop basic knowledge in the principles of electrochemical analytical techniques.
CO - 5	Develop interpretation Skills in terms of choice of analytical techniques to perform the estimation of different category drugs.

**COURSE NAME: Pharmaceutics I**

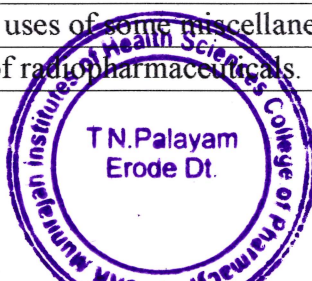
**COURSE CODE: BP103T**

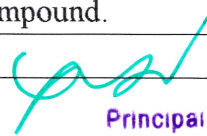
CO - 1	Summarize the history of pharmacy and list the pharmacopeia along with their features.
CO - 2	Utilize the pharmaceutical calculations for formulating and dispensing various dosage forms.
CO - 3	Define various pharmaceutical dosage forms along with formulations and methods of preparations.
CO - 4	Inspect the physical, chemical and therapeutic incompatibilities for preparation and dispensing List out code of ethics.
CO - 5	Explain where pharmaceutical additives are used and classify them.

**COURSE NAME: Pharmaceutical Inorganic Chemistry**

**COURSE CODE: BP104T**

CO - 1	Define terminology related to pharmacopoeia and impurities.
CO - 2	Outline buffers, methods of tonicity, electrolytes and dental products.
CO - 3	Utilize the knowledge of gastrointestinal agents.
CO - 4	Examine the assay and medicinal uses of some miscellaneous compound.
CO - 5	Evaluate activity and properties of radio pharmaceuticals.



  
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**COURSE NAME: Communication skills**

**COURSE CODE: BP105T**

CO - 1	Develop language skills like listening, speaking, reading and writing.
CO - 2	Organize and deliver discussions, presentations effectively with proper syntax.
CO - 3	Apply their skills in interviews or in Group Discussions.
CO - 4	Adapts good pronunciation, good communicative styles.
CO - 5	Plan their presentations and seminars in an organized manner.

**COURSE NAME: Remedial Biology**

**COURSE CODE: BP106RBT**

CO - 1	Explain the Cell biology (Basic Nature of plant cell and Animal cell)
CO - 2	Classify the System of both plants and animals.
CO - 3	Discuss various tissue system and organ system in plant and animals.
CO - 4	Explain the theory evolution
CO - 5	Demonstrate the Anatomy and Physiology of plant and animals.

**COURSE NAME: Remedial Mathematics.**

**COURSE CODE: BP106RMT**

CO - 1	Explain the Cell biology (Basic Nature of plant cell and Animal cell)
CO - 2	Classify the System of both plants and animals.
CO - 3	Discuss various tissue system and organ system in plant and animals.
CO - 4	Explain the theory evolution
CO - 5	Demonstrate the Anatomy and Physiology of plant and animals.

**COURSE NAME: Human Anatomy and Physiology Practical**

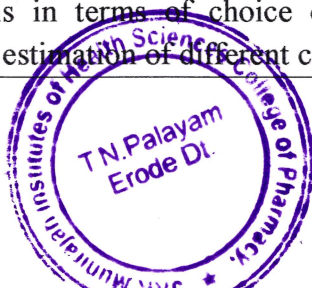
**COURSE CODE: BP107P**

CO - 1	Identify the major tissue types and locate examples of each in the body.
CO - 2	Describe the different types of bones and provide an example of each type.
CO - 3	Locate and identify anatomical structures that surround and protect the brain.
CO - 4	Locate and identify anatomical structures of special sense.
CO - 5	Describe the somatic reflex arc.

**COURSE NAME: Pharmaceutical Analysis – I Practical**

**COURSE CODE: BP108P**

CO - 1	Develop the Calculations of various standardized solutions.
CO - 2	Construct the fundamental methodology to prepare different strength of solutions and can Predict the sources of Errors.
CO - 3	Develop knowledge on principal and assay procedure of electrochemical analytical techniques.
CO - 4	Develop basic knowledge in the principles of titrimetric methods.
CO - 5	Develop interpretation skills in terms of choice of analytical techniques to perform the Qualitative and Quantitative estimation of different category drugs.



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**COURSE NAME: Pharmaceutics I Practical**

**COURSE CODE: BP109P**

CO - 1	Demonstrating and practice preparation and dispensing of various dosage forms the dosage forms
CO - 2	Identify the incompatibilities in dispensing a pharmaceutical dosage form.
CO - 3	Evaluate the prescription and estimate the accurate dose using various calculations.
CO - 4	Demonstrating and practice preparation and dispensing of various dosage forms the Semisolid dosage forms.
CO - 5	Demonstrating and practice preparation and dispensing of various dosage forms the Mouthwashes.

**COURSE NAME: Pharmaceutical Inorganic Chemistry Practical**

**COURSE CODE: BP110P**

CO - 1	Perform Limit test for the various Inorganic compounds as per the procedure given in Indian pharmacopoeia.
CO - 2	Calibrate weights, pipette and burette.
CO - 3	Perform assay various inorganic compounds with the help of titrations.
CO - 4	Identify different inorganic compounds.
CO - 5	Prepare and purify different inorganic compounds.

**COURSE NAME: Communication skills – Practical**

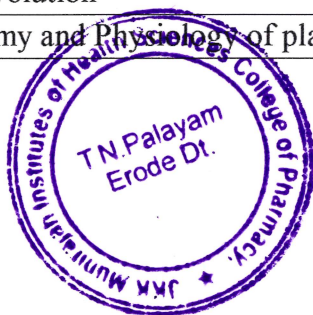
**COURSE CODE: BP111P**

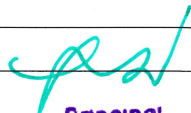
CO - 1	Adapts good pronunciation, identifying the correct speech sounds and excel to communicate well in the professional and personal contexts.
CO - 2	Creates a consistent accent and builds confidence.
CO - 3	Identifies the errors in pronunciation and facilitates students in speaking Target language i.e. English without the influence of mother tongue.
CO - 4	Demonstrate public speaking skills with clarity and confidence through appropriate verbal and nonverbal communication.
CO - 5	Develop the comprehension skills and improves appropriate language for public speaking group discussions and Interviews.

**COURSE NAME: Remedial Biology– Practical**

**COURSE CODE: BP112RBP**

CO - 1	Identify the cell biology (Basic Name of Plant cell and Animal cells)
CO - 2	Classify the system of both Plants and Animals.
CO - 3	Isolate various tissue system and organ system in Plants and Animals
CO - 4	Explain the theory of evolution
CO - 5	Demonstrate the Anatomy and Physiology of plants and animals.



  
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**YEAR: I**

**SEMESTER – II**

**REGULATION: 2014**

**COURSE NAME: Human Anatomy and Physiology II**

**COURSE CODE: BP201T**

CO - 1	Identify the major components of the circulatory system and lymphatic system, describe their functions.
CO - 2	Describe the flow of blood through the heart and the role of them atrium, ventricle, and valve in this process.
CO - 3	Describe the components and functions of major digestive juices and explain where they are produced,
CO - 4	Describe pulmonary ventilation and identify the structures and Identify the major component of the urinary system and describe their functions.
CO - 5	Locate and identify the structure that make up the female and male reproductive system.

**COURSE NAME: Pharmaceutical Organic Chemistry I**

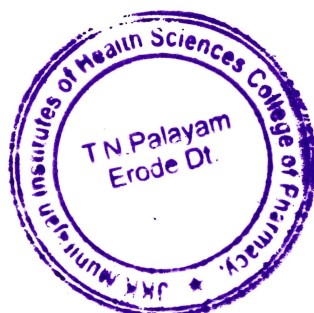
**COURSE CODE: BP202T**

CO - 1	Apply the principles of organic chemistry to classify and name organic compounds.
CO - 2	Identify and distinguish the structural isomers organic compounds.
CO - 3	Analyser and write the reactions and uses of various organic compounds.
CO - 4	Discuss the orientation, reactivity and stability of organic compounds.
CO - 5	Identify and confirm the organic compounds by qualitative tests.

**COURSE NAME: Biochemistry**

**COURSE CODE: BP203T**

CO - 1	Define different definitions like enzymes, haemostasis, osmoregulation's, carbohydrates, protein Vitamins, lipids, nucleic acids and compare the structure and functions of different organelles.
CO - 2	Explain electron transport chain and oxidative phosphorylation, its importance and mechanism of actions.
CO - 3	Determine the energetic of various metabolic pathways like glycolysis, ETC, Krebs cycle, Beta oxidation of fatty acids etc.
CO - 4	Classify and explain the different type os enzyme and enzyme inhibition. Demonstrate the factors effecting enzyme action.
CO - 5	Outline the concepts and biological importance of biological macromolecules. Discuss and explain the various metabolisms of complex biochemical macromolecules like carbohydrates.



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**COURSE NAME: Pathophysiology**

**COURSE CODE: BP204T**

CO - 1	Define basic principles of Cell injury and able to explain basic mechanism involved in the process of inflammation.
CO - 2	Outline the disease related to cardiovascular, respiratory and renal system.
CO - 3	Explain the etiology of disease related to bone, joints and pathogenesis of cancer.
CO - 4	Utilize the knowledge in diagnosing the diseases related to haematological diseases and endocrine, nervous and gastrointestinal system
CO - 5	Illustrate the etiology and pathogenesis of infectious disease.

**COURSE NAME: Computer Applications in Pharmacy**

**COURSE CODE: BP205T**

CO - 1	Understand the concept of data collection and treatment
CO - 2	Apply the knowledge of data collection to find static information.
CO - 3	Understand the concept CRD, RBD and LSD and evaluate to the Design concept
CO - 4	Demonstrate the basic concepts of MS power point.
CO - 5	Analyse benefits of Data base Management systems and Structured Query Languages.

**COURSE NAME: Environmental Sciences**

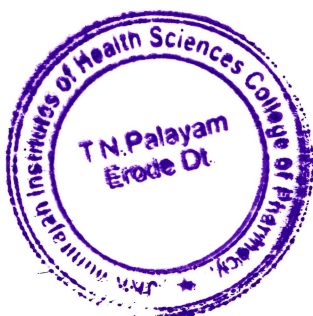
**COURSE CODE: BP206T**

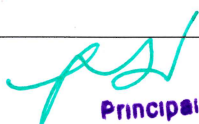
CO - 1	Create the awareness about environmental problems among learners
CO - 2	Impart basic knowledge about the environment and its allied problems
CO - 3	Develop an attitude of concern for the environment. Motivate learner to participate in environment protection and environment Improvement.
CO - 4	Acquire skills to help the concerned individuals in identifying and solving Environmental problems.
CO - 5	Strive to attain harmony with Nature.

**COURSE NAME: Human Anatomy and Physiology II Practical**

**COURSE CODE: BP207T**

CO - 1	Describe the classify the different types of blood cells.
CO - 2	Review the major steps in blood coagulation.
CO - 3	Describe a nephron and explain the functions of its major parts.
CO - 4	List the major components of blood plasma and describe the functions of each
CO - 5	Define pregnancy and describe their process of fertilization.



  
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**COURSE NAME: Pharmaceutical Organic Chemistry I– Practical**

**COURSE CODE: BP208P**

CO - 1	Apply the qualitative analysis principles to analyse organic compound having different functional groups.
CO - 2	Identify the unknown organic compound having different functional groups.
CO - 3	Explain and understand the principals of qualitative analysis.
CO - 4	Demonstrate the laboratory skills to prepare organic compounds.
CO - 5	Explain the organic chemistry concepts by constructing the molecular models.

**COURSE NAME: Biochemistry – Practical**

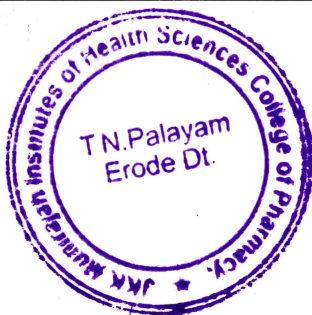
**COURSE CODE: BP209P**

CO - 1	Identify the carbohydrates by performing their individual identification tests.
CO - 2	Evaluate the Glucose content which is present in Urine.
CO - 3	Calculate the percentage of creatinine present in Blood.
CO - 4	Identify the proteins by performing their individual identification tests.
CO - 5	Identify the Amino acids by performing their individual identification tests.

**COURSE NAME: Computer Applications in Pharmacy – Practical**

**COURSE CODE: BP210P**

CO - 1	Apply the concept of data collection and treatment.
CO - 2	Apply the knowledge of data collection to find statistical information.
CO - 3	Apply the concept CRD, RBD and LSD and evaluate to the Design concept
CO - 4	Demonstrate the basic concepts of MS power point.
CO - 5	Analyse benefits of Data base Management systems and Structured Query Languages.



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**YEAR: II**

**SEMESTER – III**

**REGULATION: 2014**

**COURSE NAME: Pharmaceutical Organic Chemistry II**

**COURSE CODE: BP301T**

CO - 1	Develop basic knowledge write the structure, name and the type of isomerism of the organic compound
CO - 2	Write the reaction, name the reaction and orientation of reactions
CO - 3	Develop knowledge of the account for reactivity/stability of compounds,
CO - 4	Develop knowledge of preparation organic compounds

**COURSE NAME: Physical Pharmaceutics-I**

**COURSE CODE: BP302T**

CO - 1	Understand various physicochemical properties of drug molecules in the designing the dosage forms
CO - 2	Know the principles of chemical kinetics & to use them for stability testing NAD determination of expiry date of formulations
CO - 3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms

**COURSE NAME: Pharmaceutical Microbiology**

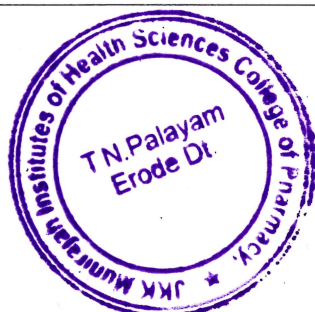
**COURSE CODE: BP303T**

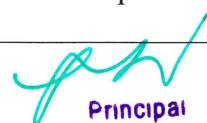
CO - 1	Understand methods of identification, cultivation and preservation of various microorganisms
CO - 2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
CO - 3	Learn sterility testing of pharmaceutical products
CO - 4	Understand the cell culture technology and its applications in pharmaceutical industries.

**COURSE NAME: Pharmaceutical Engineering**

**COURSE CODE: BP304T**

CO - 1	Explain the concept of fluid flow and describe the phenomenon of size reduction and size separation for effective practices sizing on pharmaceuticals field.
CO - 2	Outline the concepts of heat transfer mechanism and summarize the importance of various unit operations used in pharmaceutical industries like evaporation and distillation.
CO - 3	Demonstrate the principles and applications of unit operations like drying, mixing filtration and centrifugation.
CO - 4	Discuss the various material handling system, types of corrosion and their preventive methods in pharmaceutical industries.
CO - 5	Emphasis on various factors affecting the material selected for pharmaceutical plant construction.



  
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**COURSE NAME: Pharmaceutical Organic chemistry –II Practical**      **COURSE CODE: BP305P**

CO - 1	Apply the basic knowledge of organic chemistry in identification of functional groups and synthesis of organic compounds.
CO - 2	Analyse and predict the principles of chemical reaction.
CO - 3	Analyse and interpret the mechanism of chemical reactions.
CO - 4	Apply the concept of moles in calculating theoretical yield.
CO - 5	Calculate and estimate the percentage purity of the compounds synthesised.

**COURSE NAME: Physical Pharmaceutics-Practical**      **COURSE CODE: BP306P**

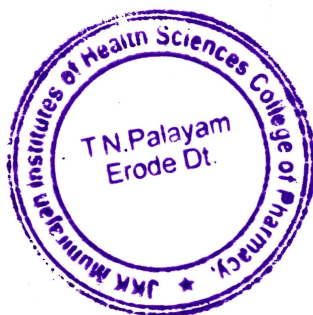
CO - 1	Determine the Physiochemical properties of pharmaceutical substances
CO - 2	Estimate the pH of the fluid
CO - 3	Estimate the pH of the liquid
CO - 4	Construct phase diagrams
CO - 5	Calculate Phase Diagrams


**COURSE NAME: Pharmaceutical Microbiology Practical**      **COURSE CODE: BP307P**

CO - 1	Understand various accessories for microbiology practical.
CO - 2	Develop basic skill in aseptic techniques.
CO - 3	Perform various staining techniques.
CO - 4	Isolate and identify microorganism from laboratory sample.
CO - 5	Standard protocols in Pharmaceutical industry -IP

**COURSE NAME: Pharmaceutical Engineering practical**      **COURSE CODE: BP307P**

CO - 1	Explain Size Analysis by Sieving, Size reduction using Ball mill, Mixing, Distillation
CO - 2	Determine Construction Working and Application of Pharmaceutical Machinery.
CO - 3	Calculate the efficiency of steam distillation and uniformity Index For given sample.
CO - 4	Evaluate Materials used for mixing, drying, filtration, centrifugation.
CO - 5	Demonstration of colloid mill, Planetary Mixer, Fluidized bed dryer, Freeze Dryer and Such other Major Equipment.



  
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**YEAR: II**

**SEMESTER – IV**

**REGULATION: 2014**

**COURSE NAME: Pharmaceutical Organic Chemistry – III**

**COURSE CODE: BP401T**

CO - 1	Apply the concepts of stereochemistry in identifying the chiral and achiral molecules, Racemisation and Racemic mixture.
CO - 2	Determine the nomenclature and configuration of stereoisomer and conformation of saturated compounds and atropisomeric.
CO - 3	Interpret the nomenclature and classification of heterocyclic compound and write the synthesis
CO - 4	Compare the reactivity and properties of heterocyclic compounds with used.
CO - 5	Outline and discuss the reaction with its mechanism and application of named reactions and reagents.

**COURSE NAME: Medicinal Chemistry - I**

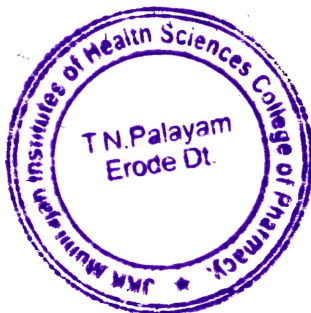
**COURSE CODE: BP402T**

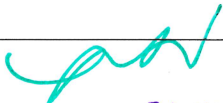
CO - 1	Apply the concept of Physiochemical Properties of drug molecule in relation of biological activity and their phase of metabolism; in the development of New drug
CO - 2	Analyse and interpret the nomenclature of compound of synthetic drugs.
CO - 3	Explain the mechanism of action of various category of drugs.
CO - 4	Apply the knowledge of medicinal chemistry in the study of structural activity relationship of drug molecules.
CO - 5	Apply the concepts of organic chemistry in the synthesis and development of lead molecule for new drug discovery.

**COURSE NAME: Physical Pharmaceutics – II**

**COURSE CODE: BP403T**

CO - 1	Apply mathematical models to determine the rate and order of reaction, shelf life and explain various factors influencing reaction rates.
CO - 2	Explain and determine interfacial properties of liquids, Explain types and properties of colloidal system.
CO - 3	Estimate the size, shape, and surface area of powder.
CO - 4	Determine the nature of flow of liquids and their measurement.
CO - 5	Formulate and evaluate suspension and emulsion.



  
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Gobi (Tk), Erode (Dt) - 638 506



# JKK MUNIRAJAH INSTITUTE OF HEALTH SCIENCES COLLEGE OF PHARMACY

(Approved by Tamil Nadu Govt. & Pharmacy Council of India - New Delhi, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai)  
Thookanaickenpalayam, Gobichettipalayam (TK), Erode (DT) - 638506, Tamil Nadu.

**COURSE NAME: Pharmacology – I**

**COURSE CODE: BP404T**

CO - 1	Outline the basic scientific concepts and principles that serves as the foundational of the pharmacological sciences including pharmacokinetics, pharmacodynamics, drug metabolism
CO - 2	Enumerates about autonomic nervous system and list out different types of drug used to treat disorders of autonomic nervous system.
CO - 3	List and discuss selected drugs used to treat disorders of central nervous system including their clinical uses and potential adverse effect.
CO - 4	Explains the pharmacology of NSAIDS Narcotic analgesic and antagonist, local anaesthetics and drug acting on various CNS disorders.
CO - 5	Understands pharmacology of anti-depressant, antipsychotic, anti-niacs, hallucinogens, antiepileptic and anti-parkinsonism drugs.

**COURSE NAME: Pharmacognosy and Photochemistry – I**

**COURSE CODE: BP405T**

CO - 1	Define pharmacology, classify the crude drugs and explain methods of drug evaluation.
CO - 2	Explain the techniques and methods involved in evaluation and collection production of crude drug.
CO - 3	Illustrate the plant tissue culture and its applications brief note on edible vaccines.
CO - 4	Explain role of pharmacognosy in traditional system of medicine.
CO - 5	Study of primary metabolites from natural sources.

**COURSE NAME: Medicinal chemistry – I Practical**

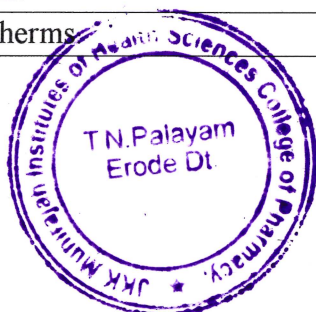
**COURSE CODE: BP406P**

CO - 1	Apply basic knowledge of organic chemistry in synthesis of Medicinal Compounds.
CO - 2	Analyse and predict the principles of chemical reactions.
CO - 3	Apply and interpret the mechanism of chemical reactions.
CO - 4	Apply the concept of moles in calculating theoretical yield.
CO - 5	Calculate and estimate the percentage purity of the compounds synthesised.

**COURSE NAME: Physical Pharmaceutics - II Practical**

**COURSE CODE: BP407P**

CO - 1	Determine the order of a reaction.
CO - 2	Analyse the properties of powders.
CO - 3	Determine the surface phenom and surface properties.
CO - 4	Construct adsorption isotherms.
CO - 5	Calculation of adsorption isotherms.



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**COURSE NAME: Pharmacology – I Practical**

**COURSE CODE: BP408P**

CO - 1	Describe about basics of experimental pharmacology.
CO - 2	Demonstrate usage of animals on experimental pharmacology and given knowledge about animal handling, route of drug administration and bleeding techniques.
CO - 3	To interpret various drug action on experimental animals.
CO - 4	To distinguish in vitro and vivo experiments.
CO - 5	Understands ethical considerations while housing and handling of experimental animals.

**COURSE NAME: Pharmacognosy and Phytochemistry – I Practical COURSE CODE: BP409P**

CO - 1	Describe about essential oil content in Eucalyptus by Clavngers apparatus.
CO - 2	Demonstrate about extraction procedure of crude drugs.
CO - 3	To interpret the Rf Values of chemical Constituents.
CO - 4	To distinguish about microscopical characters of leaf constituents.
CO - 5	Understands and differentiate spotting of crude drugs.

**YEAR: III**

**SEMESTER – V**

**REGULATION: 2014**

**COURSE NAME: Medicinal Chemistry – II**

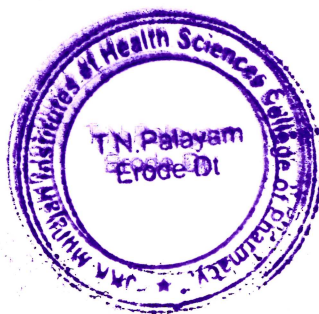
**COURSE CODE: BP501T**

CO - 1	Describe the chemistry of drugs with respect to their pharmacological activity.
CO - 2	Discuss the drug metabolic pathway, adverse effects and therapeutic value of drugs.
CO - 3	Explain the Physiochemical properties and pharmacokinetics properties of the drugs.
CO - 4	Explain the structural activity relationship of different class of drug.
CO - 5	Examine the chemical synthesis of various drug.

**COURSE NAME: Industrial Pharmacy - I**

**COURSE CODE: BP502T**

CO - 1	Define various pharmaceutical dosage forms.
CO - 2	Explain considerations involved in development of pharmaceutical dosage forms
CO - 3	Apply preformulation concepts in the development of solid, liquid and parenteral dosage forms.
CO - 4	Compare various dosage forms based on their formulation and usage.
CO - 5	Evaluate the dosage forms for their quality.



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**COURSE NAME: Pharmacology – II**

**COURSE CODE: BP503T**

CO - 1	Understanding of Anatomy and Physiology of cardiovascular system, concepts of various cardiovascular disorders, (Hypertension, Congestive heart failure, Angina)
CO - 2	Describe treatment of Hyperlipidaemias along with their classification of drugs and Pharmacology, Drug acting on blood and blood forming agents.
CO - 3	Outline concept of Autacoids – various types of autacoids (amine autacoids, lipid derived autacoids and peptide autacoids)
CO - 4	Summarize physiology of respiration and drugs acting on respiratory disorders. Concept of bioassay – principle, types, importance and application of biological
CO - 5	Demonstrate Treatment of metabolic disorders like Diabetes Melitus, Drugs acting on Thyroid disorder's Steroidal anti-inflammatory agents and oral contraceptives.

**COURSE NAME: Pharmacognosy and Phytochemistry – II**

**COURSE CODE: BP504T**

CO - 1	Define Primary metabolites. Explain about shikimic acid pathway
CO - 2	Explain about biogenesis of Atropine and Morphine.
CO - 3	List out factors effecting tracer technique.
CO - 4	Define Alkaloids and glycosides with extraction procedure.
CO - 5	Define tannins and resins.

**COURSE NAME: Pharmaceutical Jurisprudence**

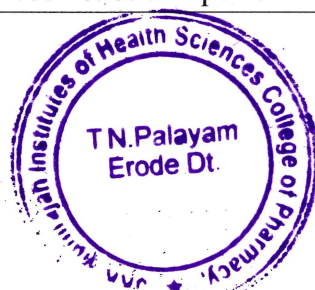
**COURSE CODE: BP505T**

CO - 1	Definitions, Legal definitions of schedules to the Act and Rules
CO - 2	To study about Various Indian pharmaceutical Acts and Laws.
CO - 3	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
CO - 4	The code of ethics during the pharmaceutical practice.
CO - 5	Introduction to Intellectual Property Rights (IPR).

**COURSE NAME: Industrial Pharmacy I – Practical**

**COURSE CODE: BP506P**

CO - 1	Explain how solubility, particle size, particle shape, crystallinity, amorphous structure of pure drug preformulations parameters plays a major role.
CO - 2	Determine the formulation and manufacturing procedures of different types of tablet dosage forms and capsules dosage forms.
CO - 3	Develop different coating procedures to tablets and evaluate prepared coated tablets.
CO - 4	Evaluate materials used for packing such as glass, plastic and rubber containers.
CO - 5	Formulate various types of cosmetics and perform evaluation of cosmetic preparations.



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**COURSE NAME: Pharmacology – II Practical**

**COURSE CODE: BP507P**

CO - 1	Define various terminology used in pharmacology
CO - 2	Identify the pharmacological actions of drugs on the tissues.
CO - 3	Identify the unknown concentration of a drugs on the animal model.
CO - 4	Compare the potency of standard with the test compound.
CO - 5	Demonstrate the animal model or bioassay method by using stimulated software.

**COURSE NAME: Pharmacognosy and Phytochemistry – II**

**COURSE CODE: BP508P**

CO - 1	Morphology, histology and powder characteristics & extraction & detection of Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander
CO - 2	Separation of sugars by Paper chromatography
CO - 3	TLC of herbal extract, Distillation of volatile oils and detection of phytoconstituents by TL
CO - 4	Analysis of crude drugs by chemical tests (i) Asafoetida (ii) Benzoin (iii) Colophony (iv) Aloes (v) Myrrh
CO - 5	Define tannins and resins.

**YEAR III**

**SEMESTER - VI**

**REGULATION: 2014**

**COURSE NAME: Medicinal Chemistry – III**

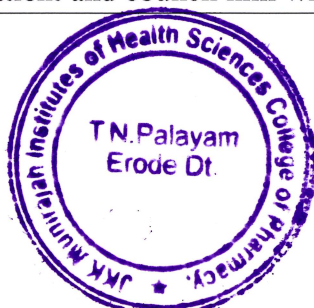
**COURSE CODE: BP601T**

CO - 1	Describe the chemistry of drugs with respect to their pharmacological activity.
CO - 2	Discuss the drug metabolic pathways adverse effects and therapeutic value of drugs.
CO - 3	Explain the physiochemical properties and pharmacokinetic properties of the drugs.
CO - 4	Explain the structural activity relationship of different class of drugs.
CO - 5	Examine the chemical synthesis of various drugs.

**COURSE NAME: Pharmacology - III**

**COURSE CODE: BP602T**

CO - 1	Define various diseases and the drugs category which are used in their treatment.
CO - 2	Classify various drugs for the treatment according to their action category and summarize their pharmacological action with side effects, dose.
CO - 3	Summarize the mechanism of action of drugs and its relevance in the treatment of different method of disease.
CO - 4	Distinguish between the available treatment procedures and select the appropriate method of treatment.
CO - 5	Evaluate the condition of patient and council him with their knowledge of pharmacology.



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**COURSE NAME: Herbal Drug Technology**

**COURSE CODE: BP603T**

CO - 1	Illustrate WHO guide lines for standardization of herbal drugs.
CO - 2	Explain and evaluate about formulation of herbal shampoos.
CO - 3	Demonstrate about Nutraceuticals with classification.
CO - 4	Define plant tissue culture with applications.
CO - 5	Ensure about formulations of herbal drugs.

**COURSE NAME: Bio pharmaceuticals and Pharmacokinetics**

**COURSE CODE: BP604 T**

CO - 1	Compare the influence of dosage forms on dissolution behaviour of same API
CO - 2	Connect various physiochemical properties of drug affect on dissolution rate of drug substance.
CO - 3	Design various techniques that enhance the dissolution rate of drugs.
CO - 4	Correlate in vitro – in vivo absorption studied of various dosage forms.
CO - 5	Solve and interpret various pharmacokinetic parameters by applying statistical treatment to pharmacokinetic data.

**COURSE NAME: Pharmaceutical Biotechnology**

**COURSE CODE: BP605T**

CO - 1	Define basic concepts of enzyme biotechnology and protein engineering.
CO - 2	Outline about recombinant DNA technology and Immunity.
CO - 3	Utilize the knowledge of hybridoma technology and vaccines.
CO - 4	Examine immune blotting techniques and genetic organization.
CO - 5	Explain about mutants, use of microorganisms in fermentation technology.

**COURSE NAME: Quality Assurance**

**COURSE CODE: BP606T**

CO - 1	Understand the GMP aspects in Pharmaceutical industry.
CO - 2	Appreciate the importance and Construct the documentation.
CO - 3	Develop knowledge and understand the scope of quality certifications applicable to Pharmaceutical industry.
CO - 4	Develop basic knowledge and understand the responsibilities of QA and QC departments.
CO - 5	Develop basic knowledge manufacturing operation and controls.



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**COURSE NAME: Medicinal Chemistry – III Practical**

**COURSE CODE: BP607P**

CO - 1	Experiment with chemicals to prepare drugs and Intermediates.
CO - 2	Estimate the percentage purity of the compounds by performing different types of assay techniques.
CO - 3	Utilize the microwave irradiation technique for the preparation of drugs and intermediates.
CO - 4	Design the structure and reactions using chem draw.
CO - 5	Determine the physiological properties of drugs.

**COURSE NAME: Pharmacology – III Practical**

**COURSE CODE: BP608P**

CO - 1	Determination of PA <sub>2</sub> value of antagonist on various isolated tissue.
CO - 2	Interpretation of unknown concentration of drugs by various bioassay methods.
CO - 3	Identify the antiulcer activity of a drug using pylorus ligation method in rate.
CO - 4	Determination of PA <sub>2</sub> value of agonists on various isolated tissue.
CO - 5	Interpret various drug action on experimental animals.

**COURSE NAME: Herbal Drug Technology Practical**

**COURSE CODE: BP609P**

CO - 1	Perform preliminary phytochemical screening of crude drugs.
CO - 2	Incorporation of prepared and standardized extract in cosmetics formulations.
CO - 3	Analysis of herbal drugs from recent Pharmacopoeias.
CO - 4	Determination of Aldehyde content.
CO - 5	Determination of phenolic content.

**YEAR: IV**

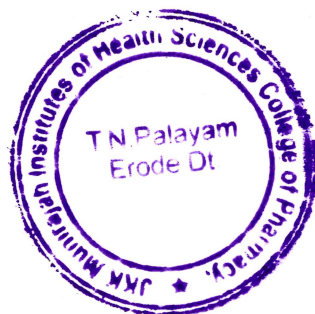
**SEMESTER: VII**

**REGULATION: 2014**

**COURSE NAME: Instrumental Methods of Analysis**

**COURSE CODE: BP701T**

CO - 1	Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
CO - 2	Understand the chromatographic separation and analysis of drugs.
CO - 3	Perform quantitative & qualitative analysis of drugs using various analytical instruments.
CO - 4	Introduction, theory, instrumentation, advantages and applications.
CO - 5	Introduction, classification, ion exchange resins, properties, mechanism of ion exchange process, factors affecting ion exchange, methodology and applications



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**COURSE NAME: Industrial Pharmacy-II**

**COURSE CODE: BP702T**

CO - 1	Know the process of pilot plant and scale up of pharmaceutical dosage forms
CO - 2	Understand the process of technology transfer from lab scale to commercial batch
CO - 3	Know different Laws and Acts that regulate pharmaceutical industry
CO - 4	Understand the approval process and regulatory requirements for drug products
CO - 5	Central Drug Standard Control Organization (CDSCO) and State Licensing Authority

**COURSE NAME: Pharmacy Practice**

**COURSE CODE: BP703T**

CO - 1	Know various drug distribution methods in a hospital, appreciate the pharmacy stores management and inventory control
CO - 2	Monitor drug therapy of patient through medication chart review and clinical review, obtain medication history interview and counsel the patients
CO - 3	Identify drug related problems, detect and assess adverse drug reactions
CO - 4	Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states, know pharmaceutical care services
CO - 5	Do patient counselling in community pharmacy, appreciate the concept of Rational drug therapy

**COURSE NAME: Novel Drug Delivery System**

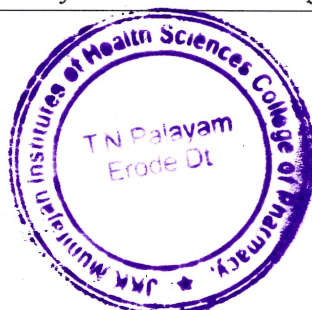
**COURSE CODE: BP704T**

CO - 1	Define various types of drug delivery systems.
CO - 2	Compare the different types of delivery systems based on their formulations and usage.
CO - 3	Evaluate drug delivery systems for their quality.
CO - 4	Apply the mechanisms in developing various drug delivery system.
CO - 5	Develop various devices related to drug delivery systems.

**COURSE NAME: Instrumental Methods of Analysis Practical**

**COURSE CODE: BP705P**

CO - 1	Determination of absorption maxima and effect of solvents on absorption maxima of organic compounds
CO - 2	Simultaneous estimation of ibuprofen and paracetamol by UV spectroscopy and Assay of paracetamol by UV- Spectrophotometry
CO - 3	Estimation of quinine sulphate by fluorimetry
CO - 4	Separation of amino acids by paper chromatography
CO - 5	Separation of plant pigments by column chromatography



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**YEAR: IV**

**SEMESTER VIII**

**REGULATION: 2014**

**COURSE NAME: Biostatistics and Research Methodology**

**COURSE CODE: BP801T**

CO - 1	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment)
CO - 2	Know the various statistical techniques to solve statistical problems
CO - 3	Appreciate statistical techniques in solving the problems.
CO - 4	Need for research, Need for design of Experiments, Experiential Design Technique, plagiarism G
CO - 5	Central composite design, Historical design, Optimization Techniques

**COURSE NAME: Social and Preventive Pharmacy**

**COURSE CODE: BP802T**

CO - 1	Acquire high consciousness/realization of current tissues related to health and pharmaceutical problems within the country and worldwide
CO - 2	Have a critical way of thinking based on current healthcare development
CO - 3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues
CO - 4	Understanding the concept of prevention and control of disease, social causes of diseases and social problems of the sick.
CO - 5	Community services in rural, urban and school health: Functions of PHC, Improvement in rural sanitation, national urban health mission, Health promotion and education in school.

**COURSE NAME: Quality Control and Standardization of Herbals**

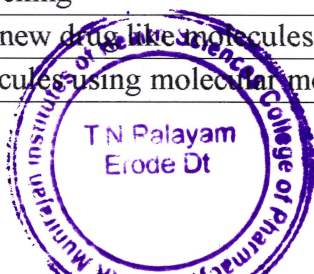
**COURSE CODE: BP806ET**

CO - 1	Basic tests for drugs – Pharmaceutical substances, Medicinal plants materials and dosage forms WHO guidelines for quality control of herbal drugs
CO - 2	Quality assurance in herbal drug industry, know the regulatory approval process and their registration in Indian and international markets
CO - 3	EU and ICH guidelines for quality control of herbal drugs. Research Guidelines for Evaluating the Safety and Efficacy of Herbal Medicines
CO - 4	Stability testing of herbal medicines. Application of various chromatographic techniques in standardization of herbal products
CO - 5	WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems Comparison of various Herbal Pharmacopoeias.

**COURSE NAME: Computer Aided Drug Design**

**COURSE CODE: BP807ET**

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



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**ACADEMIC YEAR 2022- 2023**

**PROGRAMME - M.PHARM (PHARMACEUTICS)**

**YEAR: I**

**SEMESTER - I**

**REGULATION: 2016**

**COURSE NAME: Modern Pharmaceutical Analytical Techniques**      **COURSE CODE: MPH 101T**

CO - 1	Understand the concepts and knowledge of chemicals and excipients
CO - 2	Understand the concepts and knowledge of the analysis of various drugs in single and combination dosage forms
CO - 3	Theoretical and practical skills of the instruments like HPLC, GC etc.,

**COURSE NAME: Drug Delivery System**

**COURSE CODE: MPH102T**

CO - 1	Develop knowledge on the various approaches for development of novel drug delivery systems.
CO - 2	The criteria for selection of drugs and polymers for the development of delivering system
CO - 3	Develop knowledge on the formulation and evaluation of novel drug delivery systems.

**COURSE NAME: Modern Pharmaceutics**

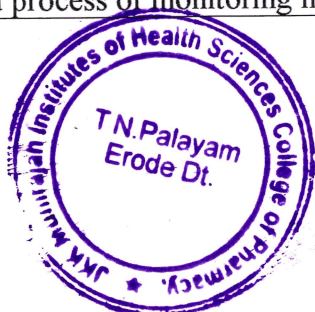
**COURSE CODE: MPH103T**

CO - 1	Understand the concept of preformulation studies.
CO - 2	Develop knowledge on the active pharmaceutical ingredients and generic drug product development
CO - 3	Understand the industrial management and GMP considerations
CO - 4	Develop knowledge on optimization techniques & pilot plant scale up techniques
CO - 5	Understand the stability testing, sterilization process & packaging of dosage forms.

**COURSE NAME: Regulatory Affair**

**COURSE CODE: MPH104T**

CO - 1	Understand the concepts of innovator and generic drugs, drug development process
CO - 2	Understand the regulatory guidance and guidelines for filing and approval process
CO - 3	Develop knowledge on preparation of dossiers and their submission to regulatory agencies in different countries
CO - 4	Post approval regulatory requirements for actives and drug products
CO - 5	Submission of global documents in ctd/ ectd formats
CO - 6	Clinical trials requirements for approvals for conducting clinical trials
CO - 7	Pharmacovigilance and process of monitoring in clinical trials.



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**YEAR: I**

**SEMESTER - II**

**REGULATION: 2016**

**COURSE NAME: Molecular Pharmaceutics (Nano Technology & Targeted DDS)**

**COURSE CODE: MPH 201T**

CO - 1	Understand the various approaches for development of novel drug delivery systems.
CO - 2	Understand the criteria for selection of drugs and polymers for the development of NTDS
CO - 3	Develop knowledge on formulation and evaluation of novel drug delivery systems.

**COURSE NAME: Advanced Biopharmaceutics & Pharmacokinetics COURSE CODE: MPH 202T**

CO - 1	The basic concepts in biopharmaceutics and pharmacokinetics.
CO - 2	Develop knowledge of use raw data and derive the pharmacokinetic models and parameters the best describe the process of drug absorption, distribution, metabolism and elimination.
CO - 3	The critical evaluation of biopharmaceutic studies involving drug product equivalency.
CO - 4	The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
CO - 5	The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic

**COURSE NAME: Computer Aided Drug Development**

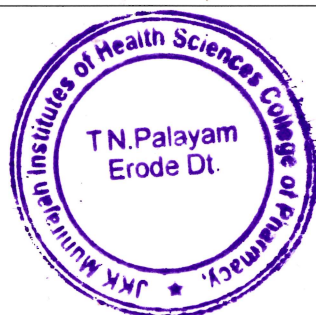
**COURSE CODE: MPH 203T**

CO - 1	History of computers in pharmaceutical research and development, computers in clinical development
CO - 2	Develop knowledge of computational modeling of drug disposition and computers in preclinical development
CO - 3	Optimization techniques in pharmaceutical formulation and computers in market analysis
CO - 4	Artificial Intelligence (AI) and Robotics and Computational fluid dynamics(CFD)

**COURSE NAME: Cosmetic and Cosmeceuticals**

**COURSE CODE: MPH204T**

CO - 1	Develop knowledge of key ingredients used in cosmetics and cosmeceuticals.
CO - 2	Understand the current technologies in the market
CO - 3	Understand the various key ingredients and basic science to develop cosmetics and cosmeceuticals
CO - 4	Scientific knowledge to develop cosmetics and cosmeceuticals with desired safety, stability, and efficacy.



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ACADEMIC YEAR 2022- 2023

PROGRAMME - M.PHARM (PHARMACEUTICAL CHEMISTRY)

YEAR: I

SEMESTER - I

REGULATION: 2016

COURSE NAME: Modern Pharmaceutical Analytical Techniques

COURSE CODE: MPC 101T

CO - 1	Understand the concepts and knowledge of the analysis of various drugs in single and combination dosage forms
CO - 2	Theoretical and practical skills of the instruments like HPLC, GC etc.,

COURSE NAME: Advanced Organic Chemistry - I

COURSE CODE: MPC102T

CO - 1	Understand the principles and applications of retrosynthesis
CO - 2	Understand the mechanism & applications of various named reactions
CO - 3	The concept of disconnection to develop synthetic routes for small target molecule
CO - 4	Various strategies to design and develop new drug like molecules for biological targets various catalysts used in organic reactions
CO - 3	Understand the chemistry of heterocyclic compounds

COURSE NAME: Advanced Medicinal Chemistry

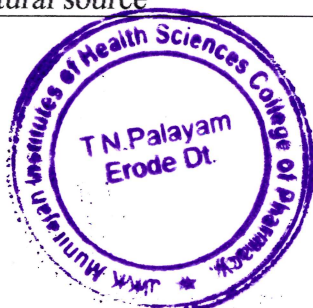
COURSE CODE: MPC103T

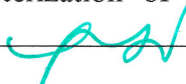
CO - 1	Various strategies to design and develop new drug like molecules for biological targets Different stages of drug discovery
CO - 2	Understand the role of medicinal chemistry in drug research
CO - 3	Understand the different techniques for drug discovery
CO - 4	Understand the various strategies to design and develop new drug like molecules for biological targets
CO - 5	Develop knowledge of the peptidomimetics

COURSE NAME: Chemistry of Natural Products

COURSE CODE: MPC104T

CO - 1	Understand the different types of natural compounds and their chemistry and medicinal importance
CO - 2	Understand the importance of natural compounds as lead molecules for new drug discovery
CO - 3	The concept of rDNA technology tool for new drug discovery
CO - 4	Develop knowledge of general methods of structural elucidation of compounds of natural origin
CO - 5	Develop knowledge of isolation, purification and characterization of simple chemical constituents from natural source



  
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**YEAR: I**

**SEMESTER - II**

**REGULATION: 2016**

**COURSE NAME: Advanced spectral analysis**

**COURSE CODE: MPC201T**

CO - 1	Understand the interpretation of the NMR, Mass and IR spectra of various organic compounds
CO - 2	Understand the theoretical and practical skills of the hyphenated instruments
CO - 3	Develop knowledge of identification of organic compounds

**COURSE NAME: Advanced Organic Chemistry - II**

**COURSE CODE: MPC202T**

CO - 1	Understand the principles and applications of green chemistry
CO - 2	Understand the concept of peptide chemistry.
CO - 3	Understand the various catalysts used in organic reactions and concept of stereochemistry and asymmetric synthesis

**COURSE NAME: Computer Aided Drug Design**

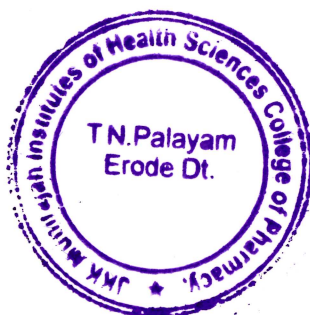
**COURSE CODE: MPC203T**

CO - 1	Understand the role of CADD in drug discovery
CO - 2	Understand the different CADD techniques and their applications
CO - 3	Understand the various strategies to design and develop new drug like molecules.
CO - 4	Understand the working with molecular modeling softwares to design new drug molecules
CO - 5	Develop knowledge of <i>in silico</i> virtual screening protocols

**COURSE NAME: Pharmaceutical Process Chemistry**

**COURSE CODE: MPC204 T**

CO - 1	Understand the strategies of scale up process of APIS and intermediates
CO - 2	Understand the various unit operations and various reactions in process chemistry



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ACADEMIC YEAR 2022- 2023

PROGRAMME – PHARM.D

YEAR: I

REGULATION: 2009

COURSE NAME: Human Anatomy and Physiology I

COURSE CODE: PD1.1

CO - 1	Identify the structure (gross and histology) and function of various organs of the human body
CO - 2	Understand the various homeostatic mechanisms and the imbalances of various systems
CO - 3	Identify the various tissues and organs of the different system of the human body
CO - 4	Analysis the haematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes
CO - 5	Understand the coordinated working pattern of different organs of each system and the interlinked mechanisms in the maintenance of normal functioning (Homeostasis) of human body

COURSE NAME: Medicinal Biochemistry

COURSE CODE: PD1.2

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

COURSE NAME: Pharmaceutics I

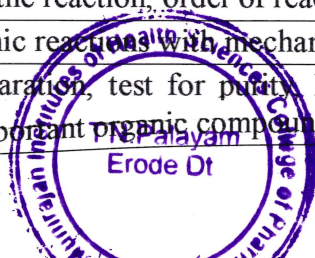
COURSE CODE: PD1.3

CO - 1	Understand the formulation aspects of different dosage forms
CO - 2	Evaluate the different pharmaceutical calculation involved in formulation
CO - 3	Formulate different types of dosage forms:
CO - 4	Appreciate the importance of good formulation for effectiveness.

COURSE NAME: Pharmaceutical organic chemistry

COURSE CODE: PD1.4

CO - 1	Develop knowledge of the IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds
CO - 2	Understand Some important physical properties of organic compounds
CO - 3	Free radical/nucleophilic (alkyl/acyl/aryl) /electrophilic substitution, free radical/ nucleophilic /electrophilic addition, elimination, oxidation and reduction reactions with mechanism, orientation of the reaction, order of reactivity, stability of Compounds.
CO - 4	Identify some named organic reactions with mechanisms:
CO - 5	Evaluate methods of preparation, test for purity, Principle involved in the assay. important medicinal uses of some important organic compounds.



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**COURSE NAME: Pharmaceutical Inorganic Chemistry**

**COURSE CODE: PD1.5**

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

**COURSE NAME: Remedial Biology**

**COURSE CODE: PD1.6**

CO - 1	Identify the natural sources such as plant and animal origin
CO - 2	Understand the various naturally occurring drugs and its history, sources, classification, distribution and the characters of the plants and animals.
CO - 3	Develop knowledge of the basic foundation to pharmacognosy.

**COURSE NAME: Remedial Mathematics.**

**COURSE CODE: PD1.6**

CO - 1	Know Trigonometry, Analytical geometry, Matrices, Determinant, integration, Differential equations, Laplace transform and their applications
CO - 2	Solve the problems of different types by applying theory
CO - 3	Appreciate the important applications of mathematics in pharmacy

**YEAR: II**

**REGULATION: 2009**

**COURSE NAME: Pathophysiology**

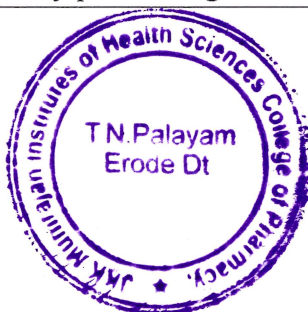
**COURSE CODE: PD 2.1**


CO - 1	Describe the etiology and pathogenesis of the selected disease states:
CO - 2	Name the signs and symptoms of the diseases
CO - 3	Mention the complications of the diseases.

**COURSE NAME: Pharmaceutical Microbiology**

**COURSE CODE: PD 2.2**

CO - 1	Identify the anatomy, identification, growth factors and sterilization of microorganisms
CO - 2	Know the mode of transmission of disease-causing microorganism, symptoms of disease, and treatment aspect:
CO - 3	Describe the estimation of RNA and DNA and there by identifying the source
CO - 4	Do cultivation and identification of the microorganisms in the laboratory:
CO - 5	Identification of diseases by performing the diagnostic tests



  
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**COURSE NAME: Pharmacognosy and Phytopharmaceuticals**

**COURSE CODE: PD 2.3**

CO - 1	Understand the basic principles of cultivation, collection and storage of crude drugs.
CO - 2	Identify the source, active constituents and uses of crude drugs.
CO - 3	Develop knowledge of the applications of primary and secondary metabolites of the plant.

**COURSE NAME: Pharmacology-1**

**COURSE CODE: PD2.4**

CO - 1	Outline the basic scientific concepts and principles that serves as the foundational of the pharmacological sciences including pharmacokinetics, pharmacodynamics, drug metabolism
CO - 2	Enumerates about autonomic nervous system and list out different types of drug used to treat disorders of autonomic nervous system.
CO - 3	List and discuss selected drugs used to treat disorders of central nervous system including their clinical uses and potential adverse effect.
CO - 4	Explains the pharmacology of NSAIDS Narcotic analgesic and antagonist, local anaesthetics and drug acting on various CNS disorders.

**COURSE NAME: Community Pharmacy**

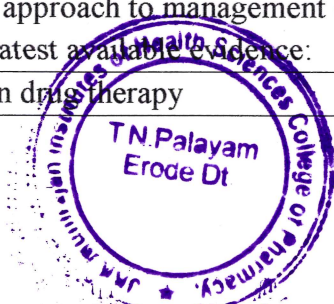
**COURSE CODE: PD2.5**

CO - 1	Understand the pharmaceutical care services.
CO - 2	Develop knowledge of the business and Professional practice management skills in community pharmacies.
CO - 3	Do patient counselling & provide health screening services to public in community pharmacy.
CO - 4	Respond to minor ailments and provide appropriate medication.
CO - 5	Show empathy and sympathy to patients and appreciate the concept of Rational drug therapy.

**COURSE NAME: Pharmacotherapeutics -1**

**COURSE CODE: PD2.6**

CO - 1	Understand the pathophysiology of selected disease states and the rationale for drug therapy
CO - 2	Identify the therapeutic approach to management of these diseases
CO - 3	Evaluate the controversies in drug therapy.
CO - 4	Understand The importance of preparation of individualised therapeutic plans based on diagnosis.
CO - 5	Understand 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 therapeutics response and adverse effects):
CO - 6	Describe the pathophysiology of selected disease states and explain the rationale for drug therapy
CO - 7	Summarise the therapeutic approach to management of these disease including reference to the latest available evidence.
CO - 8	Discuss the controversies in drug therapy



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**YEAR: III**

**REGULATION: 2009**

**COURSE NAME: Pharmacology-II**

**COURSE CODE: PD3.1**

CO - 1	Define various diseases and the drugs category which are used in their treatment.
CO - 2	Classify various drugs for the treatment according to their action category and summarize their pharmacological action with side effects, dose.
CO - 3	Summarize the mechanism of action of drugs and its relevance in the treatment of different method of disease.
CO - 4	Distinguish between the available treatments procedures and select the appropriate method of treatment.

**COURSE NAME: Pharmaceutical Analysis**

**COURSE CODE: PD3.2**

CO - 1	Introduction, source of quality variation, control of quality variation.
CO - 2	Concept of statistical quality control.
CO - 3	Validation methods quality of equipment, validation of equipment and validation of analytical instruments and calibration.
CO - 4	GLP, ISO 9000 and Total quality management quality review and documentation
CO - 5	ICH - International conference for harmonization guidelines.
CO - 6	Regulatory control.

**COURSE NAME: Pharmacotherapeutics**

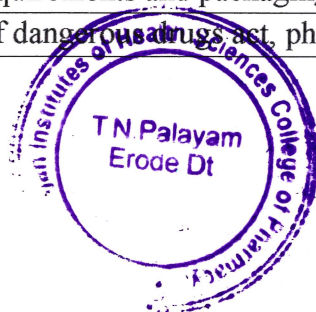
**COURSE CODE: PD3.3**

CO - 1	Understand the pathophysiology of selected disease states and the rationale for drug therapy
CO - 2	Know the therapeutic approach to management of these diseases.
CO - 3	Know the controversies in drug therapy:
CO - 4	Identify the importance of preparation of individualized therapeutic plans based on diagnosis
CO - 5	Understand 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).

**COURSE NAME: Pharmaceutical Jurisprudence**

**COURSE CODE: PD3.4**

CO - 1	Practice the Professional ethics:
CO - 2	Understand the various concepts of the pharmaceutical legislation in India:
CO - 3	Know the various parameters in the Drug and Cosmetic Act and rules
CO - 4	Know the Drug Policy, DPCO, Patent and design act:
CO - 4	Understand the labeling requirements and packaging guidelines for drugs and cosmetics.
CO - 5	Understand the concepts of dangerous drugs act, pharmacy act and excise duties act



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**COURSE NAME: Medicinal Chemistry**

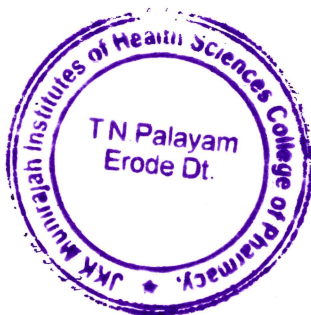
**COURSE CODE: PD3.5**

CO - 1	Evaluate the Quantitative Structure Activity Relationship (QSAR), prodrug. Combinational chemistry and computer aided drug design (CADD) and concept of antisense molecules.
CO - 2	Understand SAR mechanism of action synthesis of important compounds, Chemical nomenclature, brand names of important marketed products and their side effects

**COURSE NAME: Pharmaceutical Formulation**

**COURSE CODE: PD3.6**

CO - 1	Understand the Principle involved in formulation of various Pharmaceutical dosage forms
CO - 2	Prepare various Pharmaceutical formulation
CO - 3	Perform evaluation of pharmaceutical dosage forms
CO - 4	Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.



*Yas*  
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