PROGRAM OUTCOMES : UG PHARMACY

PO	KEY CONCEPT	EXPLANATION
PO1	Pharmacy Knowledge	Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices
PO2	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
PO3	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 make defensible decisions
PO4	Modern tool usage	Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations
PO5	Leadership skills	Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfilment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
PO6	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).
PO7	Pharmaceutical Ethics	Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal 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.
PO8	Communication	Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions
PO9	The Pharmacist and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
PO10	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.
PO11	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 to identify learning needs and to satisfy these needs on an ongoing basis.

COURSE OUTCOME : B. PHARM (NEW SYLLABUS)

NAME OF THE SUBJECT WITH CODE	OUTCOME
HU 181 COMMUNICATION SKILL	**CO.HU 181N.1:** Able to **associate** the importance of communication and the communication process. Know various perspectives in Communication and its effects.
	CO.HU 181N.2: Able to **communicate** properly for a flawless service to the industry as well as academics.
	CO.HU 181N.3: Able to **imbibe** essential interpersonal skills with proper professional attitude.
PTB 184 REMIDIAL BIOLOGY	**CO.PT 184N.1: Grasp** the significance of the characters of living organism, diversity of living world, Binomial nomenclature, five kingdoms of life and basis of classification. Salient features of Monera, Protista, Fungi, Anamals, Plants & virus. **CO.PT 184N.2**: **Appreciate** the various parts of plant-Root,stem, flower, leaf, fruit, seed.
	CO.PT 184N.3: Appreciate the significance of blood groups, coagulation of blood, composition and functions of lymph, human circulatory system, human heart, cardiac cycle, cardiac output &ECG.
	CO.PT 184N.4 To **interpret** Digestion & Absorption, Breathing & respiration, Excretory products and their elimination, Neural control and coordination, Endocrine glands and their secretions, Human reproduction.
	CO.PT 184N.5: To **understand** Plants and mineral nutrition, photosynthesis, plant respiration, plant growth and development.
	CO.PT 184N.6: Differentiate the structure and functions of cell and cell organelles, Cell division & tissues.
PTM 183 REMIDIAL MATHEMATICS	**CO.M 183N.1: Develop and understand** differentiation(successive derivative) , integration CO.M 183N.2 Basic concept of Laplace transform and its **application** in solving linear differential equations. Application in solving chemical kinetics and Pharmacokinetics equations
	CO.M 183N.3: An introductory treatment of first order differential equations. To cover solution of differential equations especially when treating exponential growth and decay applications.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PT 101 PHARMACEUTICAL ANALYSIS I	**CO.PT 101N.1**: Students will be able to **apply** different methods used in Pharmaceutical Analysis. CO.PT 101N.2 Students will be able to **utilize** the Principle behind different Pharmaceutical Analytical methods/techniques like complexometric and non aqueous titrations.
	CO.PT 101N.3: Students will be able to **apply** different Pharmaceutical Analytical techniques like electrochemical methods for analyzing various pharmaceutical products.
	CO.PT 101N.4: Students will be able to **justify** and/or **distinguish** different Pharmaceutical Analytical methods/techniques such as redox and acid-base titrations.
	CO.PT 101N.5: Students will be able to **evaluate** and **interpret** various results obtained using both titrimetric and instrumental methods of analysis.
PT 103 PHARMACEUTICAL INORGANIC CHEMISTRY	**CO.PT 103N.1**: Student will be able to **determine** the impurities in pharmaceutical inorganic substances.
	CO.PT 103N.2: Student will be able to prepare buffer solution and measure its tonicity.
	CO.PT 103N.3: Student will be able to **identify** and **determine** the medicinal and pharmaceutical uses of various inorganic compounds.
PT 105 HUMAN ANATOMY & PHYSIOLOGY I	**CO.PT 105N.1: Describe** the cellular & tissue level of organization of integumentary system, Skeletal system, Blood & Lymphatic system, Peripheral Nervous system, Cardiovascular system of the human body
	CO.PT 105N.2: **Develop** an understanding of physiological function of integumentary system, Skeletal system, Blood & Lymphatic system, Peripheral Nervous system, Cardiovascular system.
	CO.PT 105N.3: Explain homeostatic mechanism, their imbalances and consequences.
PT 106 PHARMACEUTICS I	**CO.PT 106N.1: Interpret** the prescriptions and dispense to the patient. Calculate the dose of drug according to physical and biological conditions, such as age, body weight, sex, metabolic activity, disease, drug-allergy history of the patients.
	CO.PT 106N.2: Prepare and dispense conventional solid and semi-solid dosage forms through proper understanding of the concept of incompatibilities.

NAME OF THE SUBJECT WITH CODE	OUTCOME
	CO.PT 106N.3: Prepare and **evaluate** liquid dosage forms using excipients such as surfactants, chemical stabilizers, co-solvents and antimicrobial agents and evaluate them in terms of physicochemical properties viz., droplet size, viscosity, electrophoretic mobility and stability.
HU 182 COMMUNICATION SKILLS LAB	**CO.HU 182N.1:** Able to **associate** the importance of communication and the communication process. Know various perspectives in Communication and its effects.
	CO.HU 182N.2: Able to communicate properly for a flawless service to the industry as well as academics.
	CO.HU 182N.3: Able to **imbibe** essential interpersonal skills with proper professional attitude.
PT 191 PHARMACEUTICAL ANALYSIS I LAB	**CO.PT 191N.1:** Students will be able to **apply** different methods used to prepare and standardization of Pharmaceutical compounds.
	CO.PT 191N.2: Students will be able to **utilize** the idea to assay of the Pharmaceutical active ingredients along with Standardization of Titrant.
	CO.PT 191N.3: Students will be able to **apply** different Pharmaceutical Analytical techniques like electrochemical methods for analyzing various pharmaceutical products.
PT 193 PHARMACEUTICAL INORGANIC CHEMISTRY LAB	**CO.PT 193N.1**: **Identify** some inorganic compound and examine the purity & detect the impurities in inorganic compound.
	CO.PT 193N.2: Prepare or synthesize some inorganic compound in laboratory.
	CO.PT 193N.3: To do the experiment with inorganic chemical and able to report the data scientifically.
PT 195 HUMAN ANATOMY & PHYSIOLOGY LAB	**CO.PT 195N.1:** Able to work with compound microscope
	CO.PT 195N.2: Evaluate and **differentiate** the properties of different tissues and bones.
	CO.PT 195N.3: **Evaluate, analyze and differentiate** the components of blood and the essential elements in blood clotting and bleeding time.
	CO.PT 195N.4: Evaluate, analyze and differentiate blood pressure, pulse pressure, heart rate and its importance in the physiology.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PT 196 PHARMACEUTICS I LAB	**CO.PT 196N.1**: To prepare and dispense liquid dosage forms such as solutions, syrups, elixirs, emulsion and suspension.
	CO.PT 196N.2: To prepare and dispense solid dosage forms such as powders, granules and suppositories.
	CO.PT 196N.3: To prepare and dispense semi-solid dosage forms such as ointment and gels.
PTB 185 REMIDIAL BIOLOGY LAB	**CO.PT 185N.1**:.Handle microscope and can perform microscopic study.
	CO.PT 185N.2: Identify the types of bones.
	CO.PT 185N.3: **Interpret** the importance of once blood pressure, blood group and tidal volume.
HU 282 ENVIRONMENTAL SCIENCES	**CO.HU 282N.1**: To **understand** the need of conservation natural resources.
	CO.HU 282N.2: To **explain** the structure and function of an ecosystem.
	CO.HU 282N.3: To **interpret** pollution data and design remedial action.
PT 213 PHARMACEUTICAL ORGANIC CHEMISTRY I	**CO.PT 213N.1: Design** and **develop** chemical reactions to synthesize newer organic compounds.
	CO.PT 213N.2: **Explain** organic reactions involving different parameters affecting the reaction.
	CO.PT 213N.3: Know the classification, nomenclature and isomerism of organic compounds.
PT 214 BIOCHEMISTRY	**CO.PT 214N.1:** To **explain**and **understand** the chemistry and biological importance of biomolecules such as carbohydrate, amino acids and proteins, lipids, nucleic acids.
	CO.PT 214N.2: To **compare and identify** the importance of metabolism, bioenergetics in normal or various pathological conditions.
	CO.PT 214N.3: To **describe**the genetic organization of mammalian genome and appreciate the functions of DNA in the synthesis of RNAs and proteins.
	CO.PT 214N.4: To **illustrate** the catalytic role of enzymes, importance of enzyme inhibitors and coenzyme with examples, therapeutic and diagnostic applications of enzymes and isoenzyme.
PT 215 HUMAN ANATOMY & PHYSIOLOGY II	**CO.PT 215N.1**:.**Understand** the gross morphology, and functions of nervous, reproductive, endocrine and respiratory system.

NAME OF THE SUBJECT WITH CODE	OUTCOME
	CO.PT 215N.2: Describe the physiological process of nerve conduction, reproduction, hormone regulation, urine formation and excretion, acid secretion and respiration.
	CO.PT 215N.3:.**Illustrate** the formation of ATP and understand the significance of BMR
	CO.PT 215N.4: **Describe** the structure of chromosome, DNA and explain the process of protein synthesis.
	CO.PT 215N.5: Develop as a leadership quality in fighting medical emergencies by resuscitation methods.
PT 216 PATHOPHYSIOLOGY	**CO.PT 216N.1**: **Recognize** the fundamental aspects of pathogenesis.
	CO.PT 216N.2: Analyze and **compare** the different signs and symptoms for different diseases.
	COB.PT 216N.3: **Assess** the complications and identify the different stages of various diseases.
	COB.PT 216N.4: **Analyze** the basic pathophysiological mechanisms and relate it to the pharmacological applications.
PTC 203 COMPUTER APPLICATION IN PHARMACY	**CO.PTC 203N.1**: Students will be able to **design, Implement and analyze** database system related to pharmaceutical and clinical studies with the concept of DBMS.
	CO.PTC 203N.2: With the concept of HTML and other webpage development tools, students can **design** and **develop** simple web pages about any topics.
	CO.PTC 203N.3: Students can **apply** the concept of computer / computer concept (drug design, electronic prescribing etc) in different fields of pharmaceutical studies.
PT 296 PHARMACEUTICAL ORGANIC CHEMISTRY I LAB	**CO.PT 296N.1**: **Analysis** of unknown organic compounds by designing Preliminary test, Solubility test, Functional group test like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilines, Detection of elements and Melting point/Boiling point
	CO.PT 296N.2: **Designing** a reaction pathway for the preparation of the derivatives and confirmation of organic compounds.
	CO.PT 296N.3: **Visualizing** the three dimensional structure of various compounds using the art of constructing molecular models.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PT 297 BIOCHEMISTRY LAB	**CO.PT 297N.1:** To **appraise** the qualitative and quantitative analysis of biological macromolecules *i.e.* Carbohydrate, amino acids and proteins, etc. in a given biological sample.
	CO.PT 297N.2: To **estimate** quantitatively biomolecules such as carbohydrate, proteins, lipids in body fluids like urine, blood in normal or various pathological conditions.
	CO.PT 297N.3: To **evaluate and interpret** the catalytic activity of enzymes, enzyme kinetics through performing various tests.
PT 298 HUMAN ANATOMY & PHYSIOLOGY II LAB	**CO.PT 298N.1**: **Verification** of Physiological processes which are discussed in theory classes through experiments on living beings
	CO.PT 298N.2: **Practical orientation** to the study of CNS, ANS PNS and mechanism involved in regulation of body temperature, reproductive system.
	CO.PT 298N.3: Correlating the effects and disorders of the nervous system with the physiology of the human system.
PTC 293 COMPUTER APPLICATION IN PHARMACY LAB	**CO.PTC 293N.1**: Students can **design** and develop web pages to display, store, and retrieve information about any topics.
	CO.PTC 293N.2: Students will be able to **plan, design and implement** databases.
	CO.PTC 293N.3: Students can **apply the concept** of internet and online tools for searching drug information or any other information.
PT 314 PHARMACEUTICAL ORGANIC CHEMISTRY II	**CO.PT 314N.1**: **Design and develop** chemical reactions to synthesize newer organic compounds.
	CO.PT 314N.2: **Explain** organic reactions involving different parameters affecting the action.
	CO.PT 314N.3: **Identication** and characterization of various Fats and oils.
PT 316 PHYSICAL PHARMACEUTICS I	**CO.PT 316N.1:** Upon the completion of the course student shall be able to **understand** various physicochemical properties of drug molecules important to designing dosage forms

NAME OF THE SUBJECT WITH CODE	OUTCOME
	CO.PT 316.2: Students will be able to **analyze** the use of physicochemical properties in the formulation development and **evaluation** of dosage forms and will develop sound knowledge regarding the practical applications of the various principles related to development of pharmaceuticals.
	CO.PT 316N.3: The course will enable students to be able to be **skilled** in their mathematical treatment regarding formulations.
	CO.PT 316N.4: Students will develop knowledge to **evaluate** the effectiveness of a formulation on the basis of the fundamental properties of solid and liquid systems and their various parameters.
PT 317 PHARMACEUTICAL ENGINEERING	**CO.PT 317N.1**: To **prepare** work flow sheet involved in manufacturing of different dosage form in Industry.
	CO.PT 317N.2: To **predict** different type of error associated with unit operation and their corrective method.
	CO.PT 317N.3: To **develop** various preventive methods used for corrosion control in pharmaceutical industry.
PT 319 PHARMACEUTICAL MICROBIOLOGY	**CO.PT 319N:** 1.Make use of the knowledge to prepare bacterial culture and proper handling of microscope to perform the various methods used in laboratory/industry.
	CO.PT 319N.2: Explain sterilization, disinfection, antiseptics, aseptic area & preservatives.
	CO.PT 319N.3: **Discuss** the cell culture technology and its applications in pharmaceutical industries.
PT 394 PHARMACEUTICAL ORGANIC CHEMISTRY II LAB	**CO.PT 394N.1**: **Knowledge** about different laboratory techniques, like Recrystallization, Steam distillation, etc.
	CO.PT 394N.2: **Design and development** of synthesis involving various organic compounds.
	CO.PT 394N.3: **Practical idea** to determine Acid value, Saponification value & Iodine value.
PT 396 PHYSICAL PHARMACEUTICS I LAB	**CO.PT 396N.1**: In the end, students will be able to **determine** the physicochemical parameters of drugs using various methods.
	CO.PT 396N.2: Students will be able to **understand** the methodology for carrying out the various experiments.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PT 397 PHARMACEUTICAL ENGINEERING LAB	**CO.PT 397N.1**: To **illustrate & apply** the knowledge of Pharmaceutical Machinery and estimation of radiation constant, Steam distillation, heat transfer coefficient, drying curves, moisture content, humidity of air.
	CO.PT 397N.2: To **analyse and apply** the knowledge of size analysis by sieving, size reduction and other major equipments to plan develop pharmaceutical preparations.
	CO.PT 397N.3 To **evaluate and apply** the knowledge of Factors affecting Rate of Filtration and Evaporation, effect of time on the Rate of Crystallization, uniformity Index.
PT 399 PHARMACEUTICAL MICROBIOLOGY LAB	**CO.PT 399N.1**:.**Identify** the type of microorganism and determine the potency of antibiotic
	CO.PT 399N.2:.**Develop** the skill of working in a aseptic area.
	CO.PT 399N.3: Perform the sterilization process in Laboratory set up.
	CO.PT 399N.4: **Skill** in sterility testing of pharmaceutical products.
	CO.PT 399N.5: **Differentiate** antiseptic and disinfectant.
PT 412 PHARMACOGNOSY & PHYTOCHEMISTRY I	**CO.PT 412N.1:** To **apply** the knowledge of Pharmacognosy in explaining indigenous system of medicine & to classify crude drugs on the basis of alphabetical, morphological, taxonomical, chemical, pharmacological, chemo and sero-taxonomical classification of drugs
	CO.PT 412N.2: To **judge** the presence of different types of adulterants & different characteristics to evaluate crude drugs & apply the knowledge of different plant hormones, polyploidy, mutation and hybridization technique to create disease free, genetically modified and transgenic plants
	CO.PT 412N.3: To **develop** & **design** plant tissue culture.
	CO.PT 412N.4: To **apply** the knowledge of therapeutics of different crude drugs belonging to different categories of primary and secondary metabolites.

NAME OF THE SUBJECT WITH CODE	OUTCOME
	CO.PT 412N.5: To **analyze, categorize & relate**important medicinal agents from marine sources.
PT 413 INDUSTRIAL PHARMACY I	**CO.PT 413N.1**: **Evaluate** the physical and chemical parameters of a drug, and understand the role of those parameters during formulation of a dosage form.
	CO.PT 413N.2: **Prepare** different dosage forms such as tablets, capsules, liquids, and cosmetics through scalable techniques and **evaluate** them according to the quality tests mentioned in different national compendiums.
	CO.PT 413N.3: **Reviewing** the materials used for packaging of pharmaceuticals and identifying the chances of any adverse effect on packed products.
PT 414 PHARMACEUTICAL ORGANIC CHEMISTRY III	**CO.PT 184N.2**: **Design** and **development** of newer bioactive organic compounds.
	CO.PT 414N.2: Explain organic reactions involving different parameters affecting the reaction.
	CO.PT 414N.3: **Knowledge** of stereoisomers of organic compounds.
PT 416 PHYSICAL PHARMACEUTICS II LAB	**CO.PT 416N.1**: **Able** to identify various standard values physicochemical properties of drug molecules.
	CO.PT 416N.2: Students can **derive** equation and identify the half-life and shelf life for stability of formulation.
	CO.PT 416N.3: Able to **optimize** the mathematical equation in physical chemistry to improve the stability of formulation.
	CO.PT 416N.4: They can **formulate** the new drug release pattern from formulation.
PT 418 PHARMACOLOGY I	**CO.PT 418N.1**: Students will be able to **describe** the pharmacological concepts regarding peripheral nervous system and central nervous system.
	CO.PT 418N.2: Students will be able to identify specific drugs of different classes related to the nervous system along with the mechanism of action, pharmacological actions, clinical effects, indications, and adverse effects.
	CO.PT 418N.3 Students will be able to **differentiate** the different types of ailments involving the nervous system and would be able to identify the correct therapeutic options for the same. Students will learn to evaluate the possible adverse effects of the drugs used in treatment of those ailments.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PT 492 PHARMACOGNOSY & PHYTOCHEMISTRY I LAB	**CO.PT 492N.1**: To **utilize** the knowledge of crude drugs belonging to the category of pharmaceutical aids & to apply them as excipients in different pharmaceutical formulations.
	CO.PT 492N.2: To **utilize** the knowledge of microscopical properties of crude drugs in standardization & identification of crude drugs.
	CO.PT 492N.3: To **apply** the knowledge of physical characteristics of crude drugs in evaluation & standardization of herbal drugs.
PT 493 INDUSTRIAL PHARMACY I LAB	**CO.PT 493N.1**: To **prepare and evaluate** tablets containing different drug compounds and compare with respect to marketed products.
	CO.PT 493N.2: To **prepare** and store sterile solution in suitable containers.
	CO.PT 493N.3: To **assess** the different physical and chemical parameters related to preformulation studies of different drugs.
PT 496 PHYSICAL PHARMACEUTICS II LAB	**CO.PT 496N.1**: Able to **identify** various standard values physicochemical properties of drug molecules.
	CO.PT 496N.2: Students can **derive** equation and identify the half-life and shelf life for stability of formulation.
	CO.PT 496N.3: They can **analyze** the different equation to standardize and stabilize the drug dosage form.
	CO.PT 496N.4: They can formulate new drug delivery system.
PT 498 PHARMACOLOGY I LAB	**CO.PT 498N.1**: Students would be able to administer drugs using different routes of administration of drugs in animal models. Students would be **aware** of common laboratory techniques like blood withdrawal, plasma and serum separation etc.
	CO.PT 498N.2: Students will able to **evaluate** bioactivity of drugs
	CO.PT 498N.3: Students will **learn** to carry out experiments using different instrumental techniques and to interpret the results of the experiments.
PT 512 PHARMACOGNOSY & PHYTOCHEMISTRY II	**CO.PT 512.1**: To **discuss, describe**, **explain** and **identify** different secondary metabolic pathways for alkaloids, glycosides, steroids and flavonoids.

NAME OF THE SUBJECT WITH CODE	OUTCOME
THEORY	**CO.PT 512.2:** To **recognize** and **relate** the phytochemical, pharmacological and commercial aspects of secondary metabolites.
	CO.PT 512.3: To **develop** and **design** extraction, isolation and purification techniques for crude drugs.
	CO.PT 512.4: To **apply** and **interpret** different techniques for identification and analysis of phytoconstituents.
PT 513A MEDICINAL CHEMISTRY I	**CO. PT 513A.1**: Identify the structural requirement for exerting biological activities.
	CO. PT 513A.2: Analyze drug's chemistry for stability, metabolism, activity and toxicity.
	CO. PT 513A.3: Construct future drugs through structure activity relationship for drug design.
	CO. PT 513A.4: Design chemical process, selection of reagents, catalysts and reaction conditions for synthesizing selected medicinal compounds.
PT 513B MEDICINAL CHEMISTRY II	**CO.PT 513B.1**: Students will be able to **understand** Histamine receptor in relation to biological action and **correlate** SAR synthesis MOA of H-1 antagonist, H-2 antagonists and antineoplastic agents, biological action.
	CO.PT 513B.2: Know synthesis of medicinal drugs acting on Angina, Diuretics: SAR of anti-hypertensive agents, Calcium channel blockers develop demands for drug interacting with them
	CO.PT 513B.3: Suggest and plan structures of Anti-arrhythmic drugs, Antihyperlipidemic agents, Coagulants & Anticoagulants, Congestive heart failure agents: Interpret SAR of the following agents.
	CO.PT 513B.4: They will learn structure activity relationship and biosynthesis of drugs acting on Endocrine system. Antidiabetic agents and Local anaesthetics and determine the SAR of the above mentioned compounds.
PT 516 PHARMACEUTICAL JURISPRUDENCE	**CO.PT 516N.1**: Student shall be able to **judge** different situations and be able to act according to important pharmaceutical legislations, pharmaceutical Act and Rules prevails in India as whenever it seems to be required
	CO.PT 516N.2: Student shall be able to **assess** the standards of educational regulations, compositions and functions of various regulatory authorities, committees and agencies, offences and guidelines imposed according to various pharmaceutical Acts and Rules.

NAME OF THE SUBJECT WITH CODE	OUTCOME
	CO.PT 516N.3: Student shall be able to **implement** the code of ethics in their professional activities in pharmacy.
PT 518 PHARMACOLOGY II	**CO.PT518.1**: **Interpret** the **relation** between various biomolecules resembles with physiological and pathophysiological activity essential to**formulates** safer choice of drug used in circulatory & cardiovascular, endocrinological and inflammatory disorders.
	CO.PT 518.2: Justify and **evaluate** the relation between mechanism of action and adverse drug reaction and contraindication of different drugs used in therapeutics of disease and disorder.
	CO.PT 518.3: Interpret the **importance** of various bimolecular and hormonal activities to assess their relative potency using animal tissue and intact animal.
PT 592 PHARMACOGNOSY & PHYTOCHEMISTRY II PRACTICAL	**CO.PT 592.1:** To execute morphological, microscopic and chemical characterization of various crude drugs.
	CO.PT 592.2: To design and execute extraction and isolation of phytochemicals from crude drugs.
	CO.PT 592.3: To design and formulate chromatographic procedures for separation, isolation and identification of phytoconstituents.
PT 593 MEDICINAL CHEMISTRY I PRACTICAL	**CO.PT 593.1**: Design synthesis of heterocyclic rings by selecting reagents, catalysts and reaction conditions.
	CO.PT 593.2: Design synthesis of specific drugs by selecting reagents, catalysts and reaction conditions.
	CO.PT 593.3: Develop assay methods of various drugs depending on their ring chemistry.
	CO.PT 593.4: Analyze partition coefficients of various drugs, compare their hydrophilic-lipopophilic chemistries from their partition coefficients.
PT 598 PHARMACOLOGY II PRACTICAL	**CO.PT598.1**: Determine and evaluate different animal and tissue experiment and their mathematical association to assess the outcome and to draw the conclusion.
	CO.PT598.2: Interpret the correlation between different tissue isolation, their association with various types of bioassay of different essential biomolecules.
	CO.PT598.3: Interpret and predict the importance of bimolecular activities with various physiological and pathophysiological conditions related to different clinical & medical issues.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PT 612 HERBAL DRUG TECHNOLOGY THEORY	**CO.PT 612N.1**: To **apply** the knowledge of herbal medicine, good agricultural practices in cultivation of medicinal plants including organic farming, pest management & biopesticides.
	CO.PT 612N.2: To **apply** the **knowledge** of indigenous systems of medicine & **to utilize** standardised Ayurvedic formulation as herbal medicine or, herbal formulation & different foods as nutraceuticals and **to evaluate** their effects in different diseases.
	CO.PT 612N.3: To **apply the knowledge** of different herbal drugs and their possible side effects and interaction & **to develop** & **design** different herbal formulations by utilizing the knowledge of herbal cosmetics & herbal excipients.
	CO.PT 612N.4: To **evaluate** crude drugs in preparation of standard herbal formulation.
	CO.PT 612N.5: To **apply** the knowledge of good manufacturing practices (Schedule T) to **formulate** different herbal formulations in herbal drug industry.
PT 613 MEDICINAL CHEMISTRY III THEORY	**CO. PT 613.1**: Students will be able to understand and can correlate synthesis, SAR, MOA of β- Lactam Aminoglycosides, Tetracyclines
	CO. PT 613.2: Students should know the synthesis of Macrolide, Antimalarials and Miscellaneous agents, SAR and MOA of agents and be able to develop knowledge for drugs interacting with them.
	COB. PT 613.3: Students will be able to suggest and plan structures and synthesis of Anti-tubercular Agents, Urinary tract anti-infective and Antiviral agents. Interpret SAR of the following agents
	COB. PT 613.4: Students will learn structure activity relationship, synthesis and MOA of Antifungal agents, Sulphonamides and Sulfones and be able to determine the SAR of the above-mentioned compounds.
	CO. PT 613.5: Students will be able to evaluate and interpret various results of Pharmacophore modelling and docking along with application to the combinatorial chemistry.
PT 616 BIOPHARMACEUTICS &	**CO. PT 6161**: To build an understanding about the concepts of biopharmaceutics and pharmacokinetics.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PHARMACOKINETICS THEORY	**CO. PT 616.2**: To develop the ability to estimate pharmacokinetic parameters by using various mathematical models.
	CO. PT 616.3: To be able to explain the requirement of bioavailability and bioequivalence studies.
	CO. PT 616.4: To be able to develop concepts of pharmacokinetic principles in clinical settings.
PT 618 PHARMACOLOGY III THEORY	**CO.PT618.1**:.**Interpret** the **relation** between various biomolecules resembles with physiological and pathophysiological activity essential to **choose** safe drug/drug regimen used to treat infectious diseases, cancer and transplantation.
	CO.PT618.2: Evaluate different types of side effects, adverse drug reaction; and iatrogenic and other types of toxicities.
	CO.PT618.3: **Interpret** the **importance** of mechanism of action drugs acting on infectious diseases, cancer and transplantation; and **investigation** of drug effects as a function of biologic timing and rhythm characteristics.
PT 619 PHARMACEUTICAL BIOTECHNOLOGY THEORY	CO.PT 619.1: **Apply** solitary and immobilized enzymes in industries for various productions especially pharmaceuticals.
	CO.PT 619.2: Construct genetically engineered organisms and transgenic floras for desired applications involving industrial productions.
	CO.PT 619.3: Analyze pathophysiology of organism and apply various biological remedies such as monoclonal antibodies for specific applications
	CO.PT 619.4: Create various protocols for fermentations with specific microorganisms.
PT 611 QUALITY ASSURANCE THEORY	**CO.PT 611.1:** The students will be able to **define** the basic concept of Quality control, Quality assurance and GMP, TQM, ICH Guidelines.
	CO.PT 611.2: Students will be able to **become aware of** different elements of QbD program, tools,NABL accreditation,ISO 9000 & ISO14000.
	CO.PT 611.3: Students will be able to **utilize** their level of **understanding** regarding Quality Control, Good Laboratory Practices, Document maintenance in pharmaceutical industry & Calibration and Validation.
PT 692 HERBAL DRUG	**CO.PT 692.1**: To identify different chemical constituents present in drugs.

NAME OF THE SUBJECT WITH CODE	OUTCOME
TECHNOLOGY PRACTICAL	**CO.PT 692.2:** To analyze chemical components such as alcohol or alkaloid indifferent herbal drugs and traditional dosage forms.
	CO.PT 692.3: To analyze monographs of plants used in preparation of herbal formulations.
	CO.PT 692.4 To design and execute formulation and evaluation of dosage forms with herbal extracts.
PT 693 MEDICINAL CHEMISTRY III PRACTICAL	**CO.PT 693.1**: Design and development of synthesis involving various drugs.
	CO.PT 693.2: Knowledge of assay methods involving various drug molecules
	CO.PT 693.3: Preparation of medicinally important drug molecules using modern techniques
	CO.PT 693.4: Create and design newer structure of medicinal compounds and reactions in software for further analysis.
	CO.PT 693.5: Determination of physicochemical properties such as logP, MR, molecular weight of drugs using drug design software.
PT 698 PHARMACOLOGY III PRACTICAL	**CO.PT 698.1**: To perform various calculations required for pharmacological experiments and determination of statistical significance of the study.
	CO.PT 698.2: To perform and evaluate various animal models to determine effects of various drugs.
	CO.PT 698.3: To interpret OCED guidelines.
	CO.PT 698.4: To establish the significance of various biochemical parameters and be more competent to draw inference of the effects of various drugs from various experimental models.
PT 711 INSTRUMENTAL METHODS OF ANALYSIS THEORY	**CO. PT 711.1**: The students can be able to define the basic principle of UV-Visible spectroscopy and also able to estimate the λmax.
	CO. PT 711.2: Students can organize the outline to analyze different elements with the help of Flame photometry, AAS Fluorimetry and Nepheloturbidometry.
	CO. PT 711.3: Students can compare their label understanding to interpret different compounds with the help of IR, other instrumental and chromatographic techniques.
PT 716A INDUSTRIAL PHARMACY II	**CO. PT 716A.1:** To build a large-scale production plant along with increased production rate.

NAME OF THE SUBJECT WITH CODE	OUTCOME
THEORY	**CO.PT716A.2:** Apply technology transfer knowledge innovative process may be developed.
	CO. PT 716A.3: To plan and develop an affordable health care system by utilizing law and regulation of the industry.
	CO.PT 716A.4: To formulate product ensuring that drugs, both brand-name and generic, work correctly and that their health benefits outweigh their known risks.
PT 716B NOVEL DRUG DELIVERY SYSTEM THEORY	**CO.PT 716B.1:** Student can implement their concept and knowledge to design various novel drug delivery systems.
	CO.PT 716B.2: Students can utilize their knowledge for selection of drugs and polymers for the development of novel drug delivery systems.
	CO.PT 716B.3: Students can able to prepare and evaluate different novel drug delivery systems.
PT 718 PHARMACY PRACTICE THEORY	**CO.PT 718.1:**Students will develop knowledge and ability to use principles of hospital and community pharmacy to cater to the needs of heath care system.
	CO.PT 718.2: Plan and manage the drug distribution, drug store and inventory control.
	CO.PT 718.3: Develop economical, social, administrative, managerial skills for creating community and hospital pharmacy.
	CO.PT 718.4: Analyze, interpret results of laboratory test, various adverse drug reactions and apply the information for use of appropriate medicines, provide and propose unbiased information to doctors and counsel patients.
	CO.PT 718.5: Design education and training programes and execute the role of pharmacist and develop the professional ethics.
PT 791 INSTRUMENTAL METHODS OF ANALYSIS PRACTICAL	**CO. PT 791.1:** Students will able to interpret spectroscopic data, arrange components in UV spectroscopy device.
	CO. PT 791.2: Students will be able to carry out different separation and purification techniques and their application in different pharmaceutical ingredients by different chromatographic technique.
	CO. PT 791.3: Students will be able to utilize the idea to assay of the Pharmaceutical active ingredients.

NAME OF THE SUBJECT WITH CODE	OUTCOME
PT 781 PRACTICE SCHOOL	**CO.PT781.1**: To comprehend the significance of realistic learning through practice in different areas such as dispensing and community pharmacy, pharmacovigilance, drug testing and manufacturing, quality assurance, packaging etc.
	CO.PT781.2: Todevelop the planning and technical proficiency through practical learning in the domain of interest.
	CO.PT781.3: To evaluate the problems faced during realistic practice and imply theoretical knowledge to rectify those problems.
	CO.PT781.4: To utilize their knowledge achieved in isolation, identification, standardization, formulation, manufacturing and evaluation of pharmaceuticals and cosmetics.
PT 810A PHARMACEUTICAL MARKETING MANAGEMENT	**CO.PT 810A.1:** The students can be able to define the concept of management, Analyzing consumer buying behaviour; industrial buying behaviour.
	CO.PT 810A.2: Students can take decisions for Product Branding, packaging and labelling.
	CO.PT 810A.3: Students can compare their level of understanding to interpret various situations in industry.
PT 810B COMPUTER AIDED DRUG DESIGN	**CO.PT 810B.1:** know the steps and methodologies of lead design and discovery.
	CO.PT 810B.2: Understand the implementation methodologies of lead design into drug discovery.
	CO.PT 810B.3: Apply the concept of QSAR and docking in new molcule design and development.
	CO.PT 810B.4: Construct and apply various startegies involving ligand design, QSAR and docking in designing new drug like molecules.
	CO.PT 810B.5: Create new molecules by various modelling approaches and using various molecular modelling software.
PT 810C ADVANCED INSTRUMENTATION TECHNIQUES	**CO.PT810C.1:** To explain significance and concept of advanced instrumentation i.e., MASS and NMR spectroscopy, XRD, LC-MS/MS, GC-MS/MS and also able to implement the knowledge of choosing the right instruments for the analysis of drug.
	CO.PT810C.2: To realize the difference between various thermal methods and its applications in drug analysis.

NAME OF THE SUBJECT WITH CODE	OUTCOME
	CO.PT810C.3: To comprehend the general principles and instrumentation of radioimmunoassay and its applications of advance instrument for analysis.
	CO.PT810C.4: To build idea about general principles and procedures involved in extraction techniques.
	CO.PT810C.5: To know the requirement of calibration and validation for analytical instruments and also develop the idea about the importance of ICHQ2A and USFDA review guideline.
PT 817 BIOSTATISTICS AND RESEARCH METHODOLOGY	**CO.PT817.1:** To build idea about the importance of biostatistics and its application in solving problems associated with the research.
	CO.PT817.2: To strategize and execute a research hypothesis independently.
	CO.PT817.3: To demonstrate expertise in operating M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment) and its applications in designing and analysis of experiments.
PT 818 SOCIAL AND PREVENTIVE PHARMACY	**CO. PT 818.1**: Students will be able to Evaluate alternative ways of solving problems related to health
	CO. PT 818.2: Students will Develop a critical way of thinking based on current healthcare development.
	CO. PT 818.3: Students will be capable of Identifying National health programs its objectives functioning and outcomes.
	CO. PT 818.4: Students can recognize the community services in rural, urban and school health.
	CO. PT 818.5: Students will be able to explain the general measures and strategies to be followed in social and preventive pharmacy.
PT 883 PROJECT WORK	**CO. PT 883.1:** Students will be able to identify their area of interest and learn literature survey.
	CO. PT 883.2: Students will be able to plan and execute the experimental procedures to carry out the topic.
	CO. PT 883.3: Students will be able to communicate and defend their findings in the form of thesis and seminar.