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.

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Dr. Meghnad Saha Sarani, Bidhannagar, Durgapur-713206, West Bengal (India)

PROGRAM OUTCOMES (PO): M. PHARM.

PO	KEY CONCEPT	EXPLANATION
PO1	**Research Ability**	An ability to independently carry out research and development work utilising modern tools and employing planning and problem analysis skills to solve practical problems
PO2	**Technical Communication**	An ability to write and present substantial technical documents / reports and communicate effectively
PO3	**Expertise Demonstration**	An ability to demonstrate a degree of mastery over the area of specialization in terms of pharmaceutical knowledge, learning aptitude, managerial and administrative skills, computational and informatics skills in academia, manufacturing, clinical and allied sectors
PO4	**Professional Leadership**	An ability to lead in terms of team building, planning, motivating and ethically executing professional responsibilities and establish professional identity in the society
PO5	**Environment & Sustainability**	An ability to comprehend the impact of the pharmaceutical solutions in societal and environmental contexts, and explore the knowledge of and need for sustainable development and apply the knowledge to solve such problems.

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PROGRAM SPECIFIC OUTCOMES (PSO): PHARMACEUTICS

PSO	KEY CONCEPT	EXPLANATION
PSO1	**F&D**	Apply the principles of drug delivery system in designing of safe and efficacious pharmaceutical dosage forms including novel drug delivery systems and cosmetics.
PSO2	**Unit Operations**	Able to plan, manage and carry out unit operations for environmentally sustainable manufacturing of pharmaceuticals and cosmetics.
PSO3	**Regulatory Compliance**	Able to develop and evaluate new drug formulations and cosmetics meeting the regulatory specification.
PSO4	**Modern tools**	Able to use modern scientific instrumental and computational tools in formulation development and pharmacokinetic investigation.
PSO5	**Research Methodology**	Understand, plan and apply the concepts of research methodology in pharmaceutical product development and able to interact with scientific audience through writing in form of reports/thesis or presentations

COURSE OUTCOME M. PHARM. PHARMACEUTICS (New Syllabus)

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MPT 1061 MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	**MPT 1061. CO1: Determine** the role of various drug excipients interaction.
	MPT 1061. CO2: Apply the knowledge to undertake various analytical instrumental studies such as spectroscopic, separation science, thermal, biotechnological and crystallography-based studies
	MPT 1061. CO3: Evaluate various results and interpretations of such instrumental techniques, solve any existing problems.
	MPT 1061. CO4: Develop newer analytical methods by instrumental techniques.
MPT 1062 DRUG DELIVERY SYSTEMS	**MPT 1062. CO1:** Students can able to **build** their concept and knowledge of novel drug delivery systems.
	MPT 1062. CO2: Students can **implement** their knowledge for selection of drugs and polymers for the development of novel drug delivery systems.
	MPT 1062. CO3: Students can be able to **develop** and **evaluate** various novel drug delivery systems.
MPT 1063 MODERN PHARMACEUTICS	**MPT 1063. CO1: Apply** the preformulation parameters through an optimized approach for designing a viable pharmaceutical product.
	MPT 1063. CO2: Review the policies of good manufacturing practice and implement the concept of total quality management.
	MPT 1063. CO3: Apply statistical tools for determining the stability of pharmaceutical tablets.
MPT1064 REGULATORY AFFAIR	**MPT 1064. CO1: Apply** the significance of regulatory guidelines in documentation and fulfilling of regulatory criteria for drug product approval and registration.
	MPT 1064. CO2: Understand the regulatory framework of different countries and concept of harmonization of regulatory guidelines.
	MPT 1064. CO3: Evaluate strategies for non-clinical drug development in the regulatory framework.
	MPT 1064. CO4: Student can able to **conduct** clinical trials after getting the proper approval from the regulatory method.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MPT 1965 PHARMACEUTICS PRACTICAL I	**MPT 1965. CO1:** Students will able to **develop** the analytical method of the supplied sample by various analytical instrumentation methods.
	MPT 1965. CO2: Students will able to **perform** preformulation studies and implement their knowledge to develop various novel drug delivery systems.
	MPT 1965. CO3: Students can **utilize** their knowledge to formulate and evaluate various novel drug delivery systems.
MPT 1986 SEMINAR	**MPT 1986. CO1:** Students can able to **show** competence in identifying relevant information, defining and explaining topics under discussion.
	MPT 1986. CO2: Students can able to **improve** their communication and presentation skill.
	MPT 1986. CO3: Students can**engage** with works that are widely held to be significant in the field of pharmaceutical research.
MPT 2061 MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS)	**MPT 2061. CO1:** Students can able to **implement** their knowledge on various approaches of novel drug delivery system.
	MPT 2061. CO2: Students can able to **gathe**r a clear concept on drug and formulation components required for designing novel drug delivery systems.
	MPT 2061. CO3: Students can **utilize** their knowledge to fabricate targeted drug delivery systems.
MPT 2062 ADVANCED BIO PHARMACEUTICS & PHARMACOKINETICS	**MPT 2062. CO1: Understand** the mechanism of drug absorption and the various factors affecting the movement of the drug in the body.
	MPT 2062. CO2: Students can able to **analyse** concept and significance of dissolution testing and their mathematical validation for optimization of drug bioavailability.
	MPT 2062. CO3: Students can able design and derive pharmacokinetic models for quantitative study of drug ADME (drug absorption, distribution, metabolism and elimination).
	MPT 2062. CO4: Students can able evaluate the role of bioavailability and bioequivalence studies using biopharmaceutic and pharmacokinetic parameters.
MPT 2063 COMPUTER AIDED DRUG DELIVERY SYSTEM	**MPT 2063. CO1:** Optimize the biopharmaceutical characteristics of a drug or pharmaceutical product through virtual simulations.
	MPT 2063. CO2: Review the various protocols for management of clinical data and adherence to regulatory guidelines.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT 2063. CO3: Nurture the idea of artificial intelligence and its applications in the automation in pharmaceutical industry.
MPT2064 COSMETIC AND COSMECEUTICALS	**MPT 2064. CO1:** Utilize the knowledge of regulatory requirement for the manufacturing of cosmetics.
	MPT 2064. CO2: Prepare different cosmetics and cosmeceuticals.
	MPT 2064. CO3: Evaluate the different formulation as per different official book.
MPT 2965 PHARMACEUTICS PRACTICAL II	**MPT 2965. CO1:** To prepare and characterize various polymer-based formulations for drug encapsulation.
	MPT 2965. CO2: To interpret the effect of formulation processing parameters on pharmacokinetic profile of the drugs.
	MPT 2965. CO3: To develop and evaluate different kinds of cosmeceutical products.
MPT 2986 SEMINAR	**MPT 2986. CO1:** Students can able to show competence in identifying relevant information, defining and explaining topics under discussion.
	MPT 2986. CO2: Students can able to improve their communication and presentation skill.
	MPT 2986. CO3: Students can engage with works that are widely held to be significant in the field of pharmaceutical research.
MPT 381 JOURNAL CLUB	**MPT 381. CO1:** To search articles from various scientific databases.
	MPT 381. CO2: To prepare a technical presentation for a small audience.
	MPT 381. CO3: To deliver a presentation and address related queries.
MPT 384 RESEARCH METHODOLOGY & BIOSTATISTICS	**MPT 384.CO1: Discuss** and **explain** different methods and technologies used to carry out research work**.**
	MPT 384.CO2: Assess the basic principles and working of analytical instrument in carrying out research work.
	MPT 384.CO3: Implement the regulatory requirements and follow ethics while conducting clinical trials.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT 384. CO4:Demonstrate expertise in carrying out statistical analysis of the research findings.
MPT 391 DISCUSSION/ PRESENTATION (PROPOSAL)	**MPT 391. CO1:** Students will be able to **categorize** relevant information for **defining** and **explaining** the topic for presentation.
	MPT 391. CO2: In terms of **summarizing** and organizing the whole methodology, students will be able structure their oral work and **composing** information.
	MPT 391. CO3: Students will be able to **build** appropriate vocabularies with voice modulation, voice projection and pacing.
MPT392 RESEARCH WORK	**MPT 392. CO1:** Students can develop a structured presentation methodology to prepare presentation material and effective visual aids
	MPT 392. CO2: Students can able to percolate his knowledge to the audiences.
	MPT 392. CO3: The students can be able to Determine and develop personal style.
MPT 481 JOURNAL CLUB	**MPT 481. CO1:** To search articles from various scientific databases.
	MPT 481. CO2: To prepare a technical presentation for a small audience.
	MPT 481. CO3: To deliver a presentation and address related queries.
MPT 491 FINAL PRESENTATION	**MPT 491. CO1:** Students will be able to **categorize** relevant information for **defining** and **explaining** the topic for presentation.
	MPT 491. CO2: In terms of **summarizing** and organizing the whole methodology, students will be able structure their oral work and **composing** information.
	MPT 491. CO3: Students will be able to **build** appropriate vocabularies with voice modulation, voice projection and pacing.
MPT 492 RESEARCH WORK	**MPT 492. CO1:** The students would be able to **build** problem solving skills and **execute** them to research in the related fields
	MPT 492. CO2: The students would be able to **design** plan of work, **execute** them and **interpret** the data to evaluate the work

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NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT 492. CO3: The students would be able to **write** their research reports constituting Introduction, Experimental Methods, Results & Discussion, Conclusion and References

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PROGRAM OUTCOMES (PO)

PO	KEY CONCEPT	EXPLANATION
PO1	**Research Ability**	An ability to independently carry out research and development work utilising modern tools and employing planning and problem analysis skills to solve practical problems
PO2	**Technical Communication**	An ability to write and present substantial technical documents / reports and communicate effectively
PO3	**Expertise Demonstration**	An ability to demonstrate a degree of mastery over the area of specialization in terms of pharmaceutical knowledge, learning aptitude, managerial and administrative skills, computational and informatics skills in academia, manufacturing, clinical and allied sectors
PO4	**Professional Leadership**	An ability to lead in terms of team building, planning, motivating and ethically executing professional responsibilities and establish professional identity in the society
PO5	**Environment & Sustainability**	An ability to comprehend the impact of the pharmaceutical solutions in societal and environmental contexts, and explore the knowledge of and need for sustainable development and apply the knowledge to solve such problems.

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PROGRAM SPECIFIC OUTCOMES (PSO) : PHARMACOLOGY

PSO	KEY CONCEPT	EXPLANATION
PSO1	**Discovery Pharmacology**	Building core concept on mechanism, toxicities and evaluation of drugs through pharmacological and toxicological models via comprehensive understanding of cellular and molecular pharmacology based pharmacotherapy for drug discovery and development.
PSO2	**Design and Analysis**	Understand the principles of pharmaceutical analysis and apply the modern instruments, computational and informatics tools, and techniques for target and lead optimization in designing and quantification of drugs.
PSO3	**Pharmacovigilance**	Apply and appraise regulatory and ethical concepts in preclinical and clinical research for pharmaceutical and healthcare domain in relation to society.
PSO4	**Research Methodology**	Understand, apply and appraise concepts of research methodology & biostatistics, as well as apply computational and informatics tools in clinical and pharmacovigilance research.
PSO5	**Scientific Communication**	Ability to create an inquisitive mind thorough appraisal of various journals and develop technical communication skills to able to interact with broad scientific audience through scientific writing in form of reports/thesis or presentations.

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COURSE OUTCOME: M.PHARM. PHARMACOLOGY (New Syllabus)

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MPT 1081 (Modern Pharmaceutical Analytical Techniques)	**MPT 1081. CO1: Determine** the role of various drug excipients interaction.
	MPT 1081. CO2: Apply the knowledge to undertake various analytical instrumental studies such as spectroscopic, separation science, thermal, biotechnological and crystallography-based studies.
	MPT 1081. CO3: Evaluate various results and interpretations of such instrumental techniques, solve any existing problems.
	MPT 1081. CO4: Develop newer analytical methods by instrumental techniques.
MPT 1082 (Advanced Pharmacology-I)	**MPT 1082. CO1:** Understand the pharmacodynamics and pharmacokinetics of a drug and its correlation in pharmacotherapy.
	MPT 1082. CO2: Propose different categories drugs in the treatment of a disease and execute its management.
	MPT 1082. CO3: Explain side effects, adverse effects, contradictions and the clinical uses in the treatment.
MPT 1083 (Pharmacological screening and toxicological methods I)	**MPT 1083.CO1:** Appreciate ethical use of animals in research.
	MPT 1083.CO2: Design, construct and validate animal models in context to a particular disease and used it for screening of drugs.
	MPT 1083.CO3: Evaluate the various methods in vivo and invitro screening methods used in pharmacological evaluations.
MPT 1084 Cellular and Molecular Pharmacology	**MPT 1084.CO1:** Explain the receptor signal transduction process and their molecular pathway.
	MPT 1084.CO2: Develop skills in r DNA in context to gene therapy.
	MPT 1084.CO3: Explain genetic variation and its role in pharmacology.
	MPT 1084.CO4: Develop skills in preparing and handling cell culture media.
	MPT 1985.CO1: Analyze various formulation or its components using the analytical techniques.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MPT 1985 Pharmacology Practical I	**MPT 1985.CO2:** Develop skills in working techniques used in cellular and molecular biology.
	MPT 1985.CO3: Develop skill in animal handling, administration of drugs through various routes and withdrawal of blood.
	MPT 1985.CO4: Developing skills in In vivo assay of various pharmacological activity
MPT 1986 Seminar/ Assignment	**MPT 1986. CO1:** Students can able to show competence in identifying relevant information, defining and explaining topics under discussion.
	MPT 1986. CO2: Students can able to improve their communication and presentation skill.
	MPT 1986. CO3: Students can engage with works that are widely held to be significant in the field of pharmaceutical research.
MPT 2081 (Advance Pharmacology II)	**MPT 2081. CO1:** Students will be expertise themselves in analyzing and interpretation of various biochemical involvement and cellular changes at molecular level of hormone action, inflammation, immune responses & antimicrobial resistance.
	MPT 2081. CO2: Students will develop the skill in assessment of effectiveness of drugs action, side effects & various contraindications in various disease cases.
	MPT 2081. CO3: Students will be able to Evaluate the effects of drugs vary with biological timing in various diseases like cardiovascular disease, diabetes, asthma and peptic ulcer.
	MPT 2081. CO4: Students will be able to interpret role of free radicals in aetiology of chronic health problem, and demonstrate antioxidant action.
MPT 2082 (Pharmacological and Toxicological Screening Methods – II)	**MPT 2082. CO1:** Evaluate and estimate different types of toxicity studies in regulatory toxicology and its importance in drug development.
	MPT 2082. CO2: Interpret and justify ethical and safety aspects of regulatory requirements for toxicity studies in association with investigational new drug application.
	MPT 2082. CO3: Interpret the importance of toxicokinetic and alternative methods to animal toxicity testing in association with drug discovery and assessment.
MPT 2083 (Principles of Drug Discovery)	**MPT 2083. CO1:** Understand the various stages of drug discovery and understand the various targets for drug discovery and its validation along with techniques for lead identification and optimization**.**

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT 2083. CO2: Understand the role of genomics, proteomics and bioinformatics in drug discovery.
	MPT 2083. CO3: Apply computer aided drug designing in the process of drug discovery.
MPT 2084 (Clinical Research and Pharmacovigilance	**MPT 2084. CO1:** Explain the regulatory requirements for conducting clinical trials.
	MPT 2084. CO2: Demonstrate the types of clinical trial designs.
	MPT 2084. CO3: Execute safety monitoring, reporting and close out activities.
	MPT 2084. CO4: Execute reporting of adverse drug reaction.
MPT 2985 (Pharmacology Practical II)	**MPT 2985. CO1:** Understand the principles of bioassay and its importance.
	MPT 2985. CO2: Execute toxicity study in accordance with the guidelines like OECD, ICH and determine the lethal doses of drugs.
	MPT 2985. CO3: Analyse the various clinical trials and monitoring safety and reporting of ADRs
	MPT 2985. CO4: Using Bioinformatics for drug designing
MPT 2986 (Seminar)	**MPT 2986. CO1:** Students can able to show competence in identifying relevant information, defining and explaining topics under discussion.
	MPT 2986. CO2: Students can able to improve their communication and presentation skill.
	MPT 2986. CO3: Students can engage with works that are widely held to be significant in the field of pharmaceutical research.
MPT 381 (Journal Club)	**MPT 381. CO1:** To search articles from various scientific databases.
	MPT 381. CO2: To prepare a technical presentation for a small audience.
	MPT 381. CO3: To deliver a presentation and address related queries.
MPT 384 (Research methodology & Biostatistics)	**MPT 384.CO1:** Discuss and explain different methods and technologies used to carry out research work**.**
	MPT 384.CO2: Assess the basic principles and working of analytical instrument in carrying out research work.
	MPT 384.CO3: Implement the regulatory requirements and follow ethics while conducting clinical trials.
	MPT 384. CO4: Demonstrate expertise in carrying out statistical analysis of the research findings

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MPT 391 (Discussion/ Presentation) (Proposal)	**MPT 391. CO1:** Students will be able to **categorize** relevant information for **defining** and **explaining** the topic for presentation.
	MPT 391. CO2: In terms of **summarizing** and organizing the whole methodology, students will be able structure their oral work and **composing** information.
	MPT 391. CO3: Students will be able to **build** appropriate vocabularies with voice modulation, voice projection and pacing.
MPT392 (Research Work)	**MPT 392. CO1:** Students can develop a structured presentation methodology to prepare presentation material and effective visual aids.
	MPT 392. CO2: Students can able to percolate his knowledge to the audiences.
	MPT 392. CO3: The students can be able to Determine and develop personal style.
MPT 481 (Journal club)	**MPT 481. CO1:** To search articles from various scientific databases.
	MPT 481. CO2: To prepare a technical presentation for a small audience.
	MPT 481. CO3: To deliver a presentation and address related queries.
MPT 491 (Final presentation)	**MPT 491. CO1:** Students will be able to **categorize** relevant information for **defining** and **explaining** the topic for presentation.
	MPT 491. CO2: In terms of **summarizing** and organizing the whole methodology, students will be able structure their oral work and **composing** information.
	MPT 491. CO3: Students will be able to **build** appropriate vocabularies with voice modulation, voice projection and pacing.
MPT 492 (Research work)	**MPT 492. CO1:** The students would be able to **build** problem solving skills and **execute** them to research in the related fields.
	MPT 492. CO2: The students would be able to **design** plan of work, **execute** them and **interpret** the data to evaluate the work

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NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT 492. CO3: The students would be able to **write** their research reports constituting Introduction, Experimental Methods, Results & Discussion, Conclusion and References.

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PROGRAM OUTCOMES (PO): M. PHARM.

PO	KEY CONCEPT	EXPLANATION
PO1	**Research Ability**	An ability to independently carry out research and development work utilising modern tools and employing planning and problem analysis skills to solve practical problems
PO2	**Technical Communication**	An ability to write and present substantial technical documents / reports and communicate effectively
PO3	**Expertise Demonstration**	An ability to demonstrate a degree of mastery over the area of specialization in terms of pharmaceutical knowledge, learning aptitude, managerial and administrative skills, computational and informatics skills in academia, manufacturing, clinical and allied sectors
PO4	**Professional Leadership**	An ability to lead in terms of team building, planning, motivating and ethically executing professional responsibilities and establish professional identity in the society
PO5	**Environment & Sustainability**	An ability to comprehend the impact of the pharmaceutical solutions in societal and environmental contexts, and explore the knowledge of and need for sustainable development and apply the knowledge to solve such problems.

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PROGRAM SPECIFIC OUTCOMES (PSO): PHARMACEUTICAL ANALYSIS

PSO	KEY CONCEPT	EXPLANATION
PSO1	**Modern Tool Usage**	**Know**, **Understand** and **Apply** various modern tools and instruments for identification, assay as well as data interpretations of various pharmaceutical, food, herbal and cosmetological analyses
PSO2	**Quality Control and Quality Assurance**	**Perform** and **Evaluate** various compounds or formulations from pharmaceutical, food, herbal and cosmetological domains as per official monographs, **analyze** their impurity profiles and **create** documentation as per acceptable standards.
PSO3	**Validation, standardization and Regulatory Guidelines**	**Understand** the concept of calibration and standardization for pharmaceutical instruments, manufacturing processes as well as analytical methodologies in order to **apply** them in specific cases
PSO4	**Bioanalytical profiling and Clinical Trial Design**	**Develop** bioanalytical methods for pharmacokinetic, cytological, enzymatic or biopharmaceutical evaluation for compounds of biological interest and design various methods for clinical trial of a particular NDA or ANDA class of compounds (or formulation) as per official guidelines.
PSO5	**Research and Development**	**Develop** and **create** solutions for various realistic problems through strategic research and statistical design, data analysis, interpretations and subsequent validations through peer reviewed publications.

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COURSE OUTCOME
M. PHARM. INDUSTRIAL PHARMACY

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MPT 1011 MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	**MPT1011.CO1: Understand** the principles behind various spectroscopic, chromatographic, thermal, electrochemical, biological and crystallographic instrumental techniques
	MPT1011.CO2: Evaluate the data or results produced by the above instrumental techniques and **interpret** the outcome
	MPT1011.CO3: Apply the various instruments in pharmaceutical, food and cosmetics analysis
	MPT1011.CO4: Create various analytical models with the help of the instrumental techniques and **evaluate** the data for solving new projects
MPT 1012 ADVANCED PHARMACEUTICAL ANALYSIS	**MPT1012.CO1**: **Understand** the knowledge of impurity profiling, stability studies and various biological assays
	MPT1012.CO2: **Apply** the above knowledge to fingerprint various impurities in pharmaceutical products, formulations, degradation products and biological entities from specific samples
	MPT1012.CO3: **Evaluate** and **estimate** the presence of impurities and degradation products from different active pharmaceutical ingredients (API) and formulations
	MPT1012.CO4: **Analyze** the biological entities and macromolecules from various biological and immunoassays.
MPT 1013 PHARMACEUTICAL VALIDATION	**MPT1013.CO1: Demonstrate** the aspects of validation from instruments to processes, principles, regulatory guidelines and importance
	MPT1013.CO2: Understand the concept and methodology of qualification, application to various analytical instruments
	MPT1013.CO3: Comprehend various aspects and regulatory guidelines for obtaining Intellectual Property Rights (IPR) or Patents
	MPT1013.CO4: Apply the concepts of qualification, validation, new method development and IPR filing for various processes or products
MPT 1014 FOOD ANALYSIS	**MPT1014.CO1**: **Understand** the knowledge of Food constituents, Food additives, finished food products and Pesticides in food.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT1014.CO2: **Analyse** qualitatively and quantitatively the presence of food constituents, Impurities and Pesticide in Finished food products.
	MPT1014.CO3: **Perceive** the knowledge of food regulations and legislations.
MPT 1915 PHARMACEUTICAL ANALYSIS PRACTICAL I	**MIP1915.CO1: Understand** analysis of official compounds by different instrumental method including multi-component systems.
	MIP1915.CO2: Develop knowledge and skills to calibrate various glassware and instruments used in pharmaceutical industry.
	MIP1915.CO3: Design analytical methods for food products and related components.
	MIP1915.CO4: Apply various analytical methods for impurity profiling of drugs and related candidates.
	MIP1915.CO5: Create analytical methodologies for estimation of biochemical entities in various drug and food formulations
MPT 1916 SEMINAR/ASSIGNMENT	**MIP 181.CO1:** The students would be able to **learn** different types of scholarly sources and **analyse** them
	MIP 181.CO1: The students would be able to **improve** communication skills
	MIP 181.CO3: The students would be able to **develop** problem solving skills and **conduct** research in the related fields
MPT 2011 ADVANCED INSTRUMENTAL ANALYSIS	**MPT2011.CO1:Comprehend** the principles of advanced chromatographic techniques, electrophoresis, NMR and Mass Spectroscopy
	MPT2011.CO2:Evaluate the outcomes of the above instrumental techniques
	MPT2011.CO3:Applyvarious instruments in medicinal, cosmetics and food analysis
	MPT2011.CO4:Construct various analytical models using instrumental techniques for newer projects
MPT 2012 MODERN BIO-ANALYTICAL TECHNIQUES	**MPT2012.CO1**: **Understand** the extraction of drugs from biological samples.
	MPT2012.CO2: A**nalyse** the process and steps involved in the bioanalytical method development and its validation.
	MPT2012.CO3: **Comprehend** and **discuss** the biopharmaceutical factors affecting bioavailability.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT2012.CO4: **Estimate** the pharmacokinetic parameters of drugs and **develop** the BA/BE studies.
	MPT2012.CO5: **Discuss** various cytological and enzymological assays and **analyse** its results
MPT 2013 QUALITY CONTROL AND QUALITY ASSURANCE	**MPT2013.CO1**: **Appreciate** the Concept and Evolution of Quality Control and Quality Assurance and the responsibilities of QA & QC departments.
	MPT2013.CO2: Explain the cGMP aspects in the pharmaceutical industry.
	MPT2013.CO3: Comprehend the scope of quality certifications applicable to Pharmaceutical industries through analysis of raw materials, finished products, packaging materials, in-process quality control, manufacturing operations and controls.
	MPT2013.CO4: Explain and discuss the importance of documentation in the pharmaceutical industry.
MPT 2014 HERBAL AND COSMETIC ANALYSIS	**MPT2014.CO1: Understand** the principles behind herbal drug analysis, herb-drug or food-herb interactions, bioactivity and biotransformation of herbal drugs, official guidelines, concept of herbal adulterants
	MPT2014.CO2: Evaluate impurity if herbal products by molecular fingerprinting and other high throughput instrumental techniques
	MPT2014.CO3: Analyse cosmetics by different parametric tests both qualitatively and quantitatively.
	MPT2014.CO4: Establish the relationship between cosmetic raw materials and products in India and their Indian Regulatory standards.
MPT 2915 PHARMACEUTICAL ANALYSIS PRACTICAL - II	**MPT2915.CO1: Understand** the handling principles of various analytical instruments such as spectrophotometers, chromatography, electrochemical and bioanalytical instruments
	MPT2915.CO2: Apply various instruments techniques for qualitative and quantitative analysis of various pharmaceutical compounds, fixed dose combinations, marketed dosage forms and bioanalytical entities
	MPT2915.CO3: Design and **Develop** various bioavailability and bioequivalence study protocols
	MPT2915.CO4: Apply various quality control tests for drugs, food, cosmetics and packaging materials
	MPT2915.CO5: Create Master formula records as per standard procedures and regulatory guidelines

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MPT 2916 SEMINAR/ASSIGNMENT	**MPT 281.CO1:** Students can able to **show** competence in identifying relevant information, defining and explaining topics under discussion.
	MPT 281.CO2: Students can able to **improve** their communication and presentation skill.
	MPT 281.CO3: Students can **engage** with works that are widely held to be significant in the field of pharmaceutical research.
MPT 381 JOURNAL CLUB	**MPT 381.CO1:** To **survey** articles from various scientific databases.
	MPT 381. CO2: To **prepare** a technical presentation for a small audience.
	MPT 381. CO3: To **deliver** a presentation and address related queries.
MPT 384 RESEARCH METHODOLOGY & BIOSTATISTICS	**MPT 384.CO1: Discuss** and **explain** different methods and technologies used to carry out research work**.**
	MPT 384.CO2: Assess the basic principles and working of analytical instrument in carrying out research work.
	MPT 384.CO3: Implement the regulatory requirements and follow ethics while conducting clinical trials.
	MPT 384. CO4: Demonstrate expertise in carrying out statistical analysis of the research findings.
MPT 391 DISCUSSION/ PRESENTATION (PROPOSAL)	**MPT 391. CO1:** Students will be able to **categorize** relevant information for **defining** and **explaining** the topic for presentation.
	MPT 391. CO2: In terms of **summarizing** and organizing the whole methodology, students will be able structure their oral work and **composing** information.
	MPT 391. CO3: Students will be able to **build** appropriate vocabularies with voice modulation, voice projection and pacing.
MPT392 RESEARCH WORK	**MPT 392. CO1:** Students can develop a structured presentation methodology to prepare presentation material and effective visual aids
	MPT 392. CO2: Students can able to percolate his knowledge to the audiences.
	MPT 392. CO3: The students can be able to Determine and develop personal style.
MPT 481 JOURNAL CLUB	**MPT 481. CO1:** To search articles from various scientific databases.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT 481. CO2: To prepare a technical presentation for a small audience.
	MPT 481. CO3: To deliver a presentation and address related queries.
MPT 491 FINAL PRESENTATION	**MPT 491. CO1:** Students will be able to **categorize** relevant information for **defining** and **explaining** the topic for presentation.
	MPT 491. CO2: In terms of **summarizing** and organizing the whole methodology, students will be able structure their oral work and **composing** information.
	MPT 491. CO3: Students will be able to **build** appropriate vocabularies with voice modulation, voice projection and pacing.
MPT 492 RESEARCH WORK	**MPT 492. CO1:** The students would be able to **build** problem solving skills and **execute** them to research in the related fields
	MPT 492. CO2: The students would be able to **design** plan of work, **execute** them and **interpret** the data to evaluate the work
	MPT 492. CO3: The students would be able to **write** their research reports constituting Introduction, Experimental Methods, Results & Discussion, Conclusion and References

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Dr. Meghnad Saha Sarani, Bidhannagar, Durgapur-713206, West Bengal (India)

PROGRAM OUTCOMES (PO): M. PHARM.

PO	KEY CONCEPT	EXPLANATION
PO1	**Research Ability**	An ability to independently carry out research and development work utilising modern tools and employing planning and problem analysis skills to solve practical problems
PO2	**Technical Communication**	An ability to write and present substantial technical documents / reports and communicate effectively
PO3	**Expertise Demonstration**	An ability to demonstrate a degree of mastery over the area of specialization in terms of pharmaceutical knowledge, learning aptitude, managerial and administrative skills, computational and informatics skills in academia, manufacturing, clinical and allied sectors
PO4	**Professional Leadership**	An ability to lead in terms of team building, planning, motivating and ethically executing professional responsibilities and establish professional identity in the society
PO5	**Environment & Sustainability**	An ability to comprehend the impact of the pharmaceutical solutions in societal and environmental contexts, and explore the knowledge of and need for sustainable development and apply the knowledge to solve such problems.

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PROGRAM SPECIFIC OUTCOMES (PSO): INDUSTRIAL PHARMACY

PSO	KEY CONCEPT	EXPLANATION
PSO1	**F&D**	Apply the principles of drug delivery system in the development of eco-friendly and efficacious pharmaceutical dosage forms including NDDS and cosmeceuticals.
PSO2	**Unit Operations**	Able to plan, manage and carry out unit operations for environmentally sustainable manufacturing of pharmaceuticals and cosmetics.
PSO3	**Regulatory Compliance**	Able to prepare documents related to scale-up, technology transfer and filing process of IND, NDA & ANDA.
PSO4	**Modern tools**	Use of modern pharmaceutical tools, equipment, and software to conduct, analyze and interpret data as per the needs of pharmaceutical industries
PSO5	**Research Methodology**	Understand, plan and apply the concepts of research methodology in pharmaceutical product development and able to interact with scientific audience through writing in form of reports/thesis or presentations

COURSE OUTCOME
M. PHARM. INDUSTRIAL PHARMACY

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MIP 101 MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	**MIP 101. CO1: Determine** the role of various drug excipients interaction.
	MIP 101. CO2: Apply the knowledge to undertake various analytical instrumental studies such as spectroscopic, separation science, thermal, biotechnological and crystallography-based studies
	MIP 101. CO3: Evaluate various results and interpretations of such instrumental techniques, solve any existing problems.
	MIP 101. CO4: Develop newer analytical methods by instrumental techniques.
MIP 102 PHARMACEUTICAL FORMULATION DEVELOPMENT	**MIP 102.CO1: Evaluating and analyzing** scheduled activities in a Pharmaceutical firm
	MIP 102.CO2: Interpretation of pre formulation studies of pilot batches of pharmaceutical industry.
	MIP 102.CO3: Understanding significance of dissolution and product stability.
MIP 103 NOVEL DRUG DELIVERY SYSTEMS	**MIP 103.CO1:** Able to **design** various novel drug delivery systems.
	MIP 103.CO2: Able to **select** drugs and polymers for the development of novel drug delivery systems.
	MIP 103.CO3: Able to **fabricate** targeted drug delivery systems.
	MIP 103.CO4: Able to **prepare** and **evaluate** different cosmetics and cosmeceuticals.
	MIP 103.CO5: Able to **develop** protein and peptide drug delivery systems.
MIP 104 INTELLECTUAL PROPERTY RIGHTS	**MIP 104.CO1: Understand** regulatory audit at manufacturing site and **learn** briefly about the regulatory agencies of different countries like USA, EU, Australia, South Africa, Brazil and India.
	MIP 104.CO1: Understand the importance of intellectual 2property rights and its protection, regulatory requirement for manufacturing, distribution and selling of drug in different countries.
	MIP 104.CO3: Understand what is CRO, reason for CRO, and factors to qualify as CRO.

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
MIP 191 INDUSTRIAL PHARMACY PRACTICAL I	**MIP 191.CO1:** The students would be able to **identify** dosage forms and their manufacturing techniques and **practice** them
	MIP 191.CO2: The students would be able to **formulate** solid, liquid and semisolid dosage forms and **evaluate** them.
	MIP 191.CO3: The students would be able to **correlate** the theoretical knowledge with professional and practical need of pharmaceutical industry
MIP 181 SEMINAR/ASSIGNMENT	**MPT 181.CO1:** Students can able to **show** competence in identifying relevant information, defining and explaining topics under discussion.
	MPT 181.CO2: Students can able to **improve** their communication and presentation skill.
	MPT 181.CO3: Students can **engage** with works that are widely held to be significant in the field of pharmaceutical research.
MIP 201 ADVANCED BIOPHARMACEUTICS & PHARMACOKINETICS	**MIP 201.CO1:** To **develop** concepts of biopharmaceutics and ADME processes.
	MIP 201.CO2: To be able to **estimate** pharmacokinetic parameters using various mathematical models.
	MIP 201.CO3: To **understand** the application of bioavailability and bioequivalence studies in clinical studies.
	MIP 201.CO4: To be able to **develop** concepts of pharmacokinetic principles different types of drugs, biological and modified release products.
MIP-202 SCALE UP AND TECHNOLOGY TRANSFER	**MIP 202.CO1: Understand** the basics of pilot plant design and scale up different dosage forms with proper use of Materials, Methods and Machine.
	MIP 202.CO1: Understand concept of technology transfer from R&D to manufacturing site and the concept of different validation and qualification guidelines required during technology transfer.
	MIP 202.CO1: Understand hazard, its occurrence in industry and control measures.
MIP 203 PHARMACEUTICAL PRODUCTION TECHNOLOGY	**MIP 203.CO1:** Student can **apply** their knowledge to **develop** different dosage pharmaceutical forms.
	MIP 203.CO2: Students will be able to **choose** different advanced equipment and **apply** them for manufacturing various dosage forms
	MIP 203.CO3: Students will be able to **select** of different materials used in the packaging technology of pharmaceutical

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	preparations.
	MIP 203.CO4: Students can able to **formulate** parenteral production.
	MIP 203.CO5: Students will be able to **understand** and handle the scheduled activities in a Pharmaceutical firm.
MIP-204 ENTREPRENEURSHIP MANAGEMENT	**MIP 204. CO1:** The students will be able to **define** the Conceptual Framework of Entrepreneurship Management and The Role of enterprise in national and global economy
	MIP-204. CO2: Students will be able to **understand** Dynamics of motivation and concepts of entrepreneurship.
	MIP-204. CO3: Students can **compare** and **understand** Demands and challenges of Growth Strategies and Networking.
MIP 291 INDUSTRIAL PHARMACY PRACTICAL - II	**MIP 291.CO1:** The students would be able to **practice** various practical aspects of dosage form development
	MIP 291.CO2: The students would be able to **understand** and **appreciate** the influence of pharmaceutical additives on the performance of the drug products
	MIP 291.CO3: The students would be able to **formulate** and **evaluate** the quality of **s**olid, liquid and semisolid dosage forms
MIP 281 SEMINAR/ASSIGNMENT	**MPT 281. CO1:** Students can able to show competence in identifying relevant information, defining and explaining topics under discussion.
	MPT 281. CO2: Students can able to improve their communication and presentation skill.
	MPT 281. CO3: Students can engage with works that are widely held to be significant in the field of pharmaceutical research.
MPT 381 JOURNAL CLUB	**MPT 381. CO1:** To search articles from various scientific databases.
	MPT 381. CO2: To prepare a technical presentation for a small audience.
	MPT 381. CO3: To deliver a presentation and address related queries.
MPT 384 RESEARCH METHODOLOGY &	**MPT 384.CO1: Discuss** and **explain** different methods and technologies used to carry out research work**.**

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
BIOSTATISTICS	**MPT 384.CO2: Assess** the basic principles and working of analytical instrument in carrying out research work.
	MPT 384.CO3: Implement the regulatory requirements and follow ethics while conducting clinical trials.
	MPT 384. CO4: Demonstrate expertise in carrying out statistical analysis of the research findings.
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	MPT 491. CO3: Students will be able to **build** appropriate vocabularies with voice modulation, voice projection and pacing.
MPT 492 RESEARCH WORK	**MPT 492. CO1:** The students would be able to **build** problem solving skills and **execute** them to research in the related fields

NAME OF THE COURSE WITH CODE	COURSE OUTCOME
	MPT 492. CO2: The students would be able to **design** plan of work, **execute** them and **interpret** the data to evaluate the work
	MPT 492. CO3: The students would be able to **write** their research reports constituting Introduction, Experimental Methods, Results & Discussion, Conclusion and References