HI TECH COLLEGE OF PHARMACY,

NAGPUR HIGHWAY, PADOLI PHATA, CHANDRAPUR

ACADEMIC YEAR 2021-2022

COURSE OUTCOMES F. Y. B. PHARM (SEMESTER I & II CBCS)

SEMESTER I		
Course Code	Name of the Course	Course Outcomes
BP 101T	Human Anatomy and Physiology-I (Theory)	**Upon the completion of the course student shall be able to** 1. Explain how the cellular and tissue level of organisation intricately work to maintain human body homoestasis. 2. Explain the anatomy and physiology of axial and appendicular skeletal system with its articulation. 3. Explain anatomy and physiology of fluid connective tissue. 4. Explain how the peripheral nervous system of human body responds to external stimuli. 5. Explain the anatomy and physiology of cardiovascular system.
BP 107P	Human Anatomy and Physiology-I (Practical)	**Upon the completion of the course student shall be able to** 1. Explain the histology of different tissues. 2. Explain the anatomy of human skeleton. 3. Explain the importance of different blood cells which is indicative for human disorders. 4. Explain the importance of pathological changes which is indicative for human disorders. 5. Know the different techniques of blood cell count of human being.
Course Code	Name of the Course	Course Outcomes
BP 102T	Pharmaceutical Analysis-I (Theory)	**Upon the completion of the course student shall be able to** 1. Understand the principles of volumetric and electro-chemical analysis like precipitation, conductometric, potentiometric and polarographic titrations 2. Understand about complexometric and non-aqueous titration, redox titration that helps them in performing practical's and expression of various concentrations and preparations.

		3. The course will develop different analytical skill, find out different source of impurities and limit tests, gravimetric analysis. 4. Understand the qualitative and quantitative estimations of chemical compounds, and can find errors in analysis. 5. Differentiate the analytical techniques used in analysis of pharmaceuticals with reference to Indian Pharmacopoeia and other reference book.
BP 108P	Pharmaceutical Analysis-I (Practical)	**Upon the completion of the course student shall be able to** 1. Able to apply volumetric and electrochemical analytical techniques for analysis of chemical compounds. 2. Able to identify and locate the sources of impurities through different technique like limit test. 3. The students will be able to apply the use of different reference books for different fundamental techniques of analysis. 4. By taking regular viva-voce we can be analyses the achievements of practical knowledge. 5. Expected to appraise the general characteristics of the analytical method in drug analysis.
Course Code	Name of the Course	Course Outcomes
BP 103T	Pharmaceutics-I (Theory)	**Upon the completion of the course student shall be able to** 1. Know the history of profession of pharmacy and Pharmacopeia's. 2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations. 3. Understand the professional way of handling the prescription and factors affecting dose. 4. To understand the use of various excipients and solubility enhancement techniques. 5. Describe general formulation, preparation and evaluation of Suppositories, various liquid, powder and semisolid dosage forms.

BP 109P	Pharmaceutics-I (Practical)	**Upon the completion of the course student shall be able to** 1. Describe the theory, procedure and other data regarding various specified dosage forms preparation. 2. Relate the theoretical aspects to practical application and acquire laboratory skills. 3. Prepare quality dosage formulations of various specified types with confidence and skill. 4. Pack the preparation in suitable selected containers. 5. Label the preparation clearly for communicating to consumers.
Course Code	Name of the Course	Course Outcomes
BP 104T	Pharmaceutical Inorganic Chemistry (Theory)	**Upon the completion of the course student shall be able to** 1. Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals. 2. Able to know the therapeutic applications of different classes of inorganic pharmaceuticals and their analysis. 3. Able to calculate the various Pharmaceuticals calculations through regular practice. 4. Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease. 5. Able to communicate the therapeutic, diagnostic and research values of radiopharmaceuticals.

BP 110P	Pharmaceutical Inorganic Chemistry (Practical)	**Upon the completion of the course student shall be able to** 1. Understand practically how can detect and control the pharmaceutical impurities. 2. Able to prepare and identify the inorganic pharmaceuticals by adopting proper skill. 3. Able to assemble the apparatus and equipments necessary for the practical by proper communication. 4. Use safety procedure for the handling of hazardous chemicals by using protective tools concerning to human health and environment. 5. Able to communicate by expressing theoretical and practical knowledge through viva-voce.
Course Code	Name of the Course	Course Outcomes
BP 105T	Communication Skills (Theory)*	**Upon the completion of the course student shall be able to** 1. Students would have studied about communication process in detail. 2. Students would have studied about different elements of communication. 3. Students would understand the listening skill in pharmacy practice. 4. Students would have improved the leadership qualities in group discussion process. 5. Students would understand the communication skills that are usually assessed in group discussions.
BP 111P	Communication Skills (Practical)*	**Upon the completion of the course student shall be able to** 1. Students would understand how to improve communication skills. 2. They would have learnt about basics of communication skills. 3. Students would understand the Prounciation. 4. Students would understand the Presentation skills. 5. Students would understand the E- Mail Etiquette.
Course Code	Name of the Course	Course Outcomes

BP 106 RBT	Remedial Biology (Theory)*	**Upon the completion of the course student shall be able to** 1. Students would have studied about classification and silent features of five kingdoms of life. 2. They would have studied in detailed about Body fluids, Digestive system and Respiratory system. 3. Students would understand the Urinary system, Nervous system and Reproductive system. 4. Students would have learnt about Plants and mineral nutrition. 5. Students would have learnt about Anatomy and Physiology of plants and animals.
BP 112 RBP	Remedial Biology (Practical)*	**Upon the completion of the course student shall be able to** 1. Students would have studied about experiments in biology. 2. Students would have studied about study of cell and its inclusions. 3. Students would have studied about Stem, Root and Leaf. 4. Students would able to identify the tissues and Microscopic study. 5. They would have learnt and performed the experiments like blood group, blood Pressure and tidal volume.
Course Code	Name of the Course	Course Outcomes
BP 106 RMT	Remedial Mathematics (Theory)*	**Upon the completion of the course student shall be able to** 1. Apply mathematics concept and principles to perform computations for pharmaceutical sciences. 2. Create use and analyse mathematical representation. 3. Create use and analyse mathematical relationships. 4. Learn to communicate mathematical knowledge and understanding to help in the field of clinical pharmacy. 5. Perform abstract mathematical reasoning.
SEMESTER II		
Course Code	Name of the Course	Course Outcomes

BP 201T	Human Anatomy and Physiology-II (Theory)	**Upon the completion of the course student shall be able to** 1. Discuss the gross morphology, structure and functions of various organs of the human body. 2. Discuss the diverse homeostatic mechanisms and their imbalances. 3. Explain the various tissues and organs of different systems of human body. 4. Discuss the synchronized functioning pattern of dissimilar organs of each system. 5. Discuss the interconnected mechanisms in the maintenance of normal functioning of human body.
BP 207P	Human Anatomy and Physiology-II (Practical)	**Upon the completion of the course student shall be able to** 1. Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc. 2. Perform the cardiovascular parameters like blood pressure, heart rate, pulse rate. 3. Identify the different tissues and organs of dissimilar systems of human body. 4. Explain the importance of various family planning devices for human body. 5. Discuss the gross morphology, structure and functions of various organs of the human body.
Course Code	Name of the Course	Course Outcomes
BP 202T	Pharmaceutical Organic Chemistry-I (Theory)	**Upon the completion of the course student shall be able to** 1. IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compound. 2. Understand some important physical properties of organic compounds. 3. Know free radical, nucleophilic(alkyl, acyl, aryl), electrophilic substitution, oxidation and reduction reaction with mechanism, orientation of the reaction. 4. Know order of reactivity, stability of compounds. **5.** Understand some named organic reactions with mechanism.
BP 208P	Pharmaceutical Organic Chemistry-I (Practical)	**Upon the completion of the course student shall be able to** 1. Predict atomic structure, chemical bonding and molecular geometry based on accepted model. 2. Able to identify and characterize the organic compound by various qualitative test.

		3. Follow the safety procedure to set up glassware and apparatus to conduct experiments in organic chemistry. 4. Adopt proper skill to present the results of a practical investigation in a concise manner by referring the available resources. **5.** Able to communicate the hazardous effect of over use of organic product in daily life.
Course Code	Name of the Course	Course Outcomes
BP 203T	Biochemistry (Theory)	**Upon the completion of the course student shall be able to** 1. Students learned about chemistry and the biological importance of biological macromolecule. 2. Understand fundamental principles of biochemistry, including major pathways of metabolism, biosynthesis, replication transcription, and translation. 3. Explain qualitative and quantitative understanding of biomolecule structure, the enzyme catalyzes a chemical reaction that transforms biomolecule. 4. Explain different types of macromolecule their structure and functions. 5. Explain the metabolism of carbohydrate, lipid, amino acid and their role in our body
BP 209P	Biochemistry (Practical)	**Upon the completion of the course student shall be able to** 1. Understand the qualitative test for protein. 2. Understand the determination of glucose, total cholesterol, and creatinine in the blood. 3. Determine the salivary amylase activity and effect of temperature on it. 4. Quantitative analysis of reducing sugar and protein 5. Understand the effects of substrate concentration on salivary amylase activity.
Course Code	Name of the Course	Course Outcomes
BP 204T	Pathophysiology (Theory)	**Upon the completion of the course student shall be able to** 1. Explain the basic principles and mechanism of cell injury and the process of inflammation.

		2. Explain the pathophysiology, sign and symptoms of several disorders example: - CVS, respiratory etc. 3. Explain the pathophysiology, sign and symptoms of several disorders example: - Haematological, endocrine, etc. 4. Explain the pathophysiology, sign and symptoms of several disorders example: - Cancer, arthritis, etc. 5. Explain the pathophysiology, sign and symptoms of several diseases example: - T.B, STD, etc.
Course Code	Name of the Course	Course Outcomes
BP 205T	Computer Applications in Pharmacy (Theory)*	**Upon the completion of the course student shall be able to** 1. Know the various types of application of computers in pharmacy. 2. Know the various types of databases. 3. Know the various applications of databases in pharmacy. 4. Know the web based tools for pharmacy practice. 5. Apply the knowledge to design and develop digital tools for pharmaceutical applications.
BP 210P	Computer Applications in Pharmacy (Practical)*	**Upon the completion of the course student shall be able to** 1. Understand different types of software for structural drawings and prepare tables and charts for presentations of chemical and biological data. 2. Apply their knowledge by access of various search engines, scientific journals and databases, & various pharmaceutical websites for scientific information. 3. Understand the use of Computers in pharmacy for the information of drug data, records and files, drug management. 4. Know the role of computer in receiving the details, storing it and processing it and its dissemination and this continuous flow of information shows effective functioning of any system. 5. Know the use of computer for patient profile monitoring, medication, database management and material management.
Course Code	Name of the Course	Course Outcomes

BP 206T	Environmental Science (Theory) *	**Upon the completion of the course student shall be able to** 1. Understand basics of environment like ecology, ecosystems, food chain, food web & ecological pyramids. 2. Know the different natural sources & their conservation to save the environment. 3. Know the current problems of environment & how to solve them, role of individual in conservation of environment & natural resources. 4. Understand the different factors of environmental pollution & measures to minimize it. 5. Aware about hazards of disposal wastes from hospitals & pharmaceutical industries.

COURSE OUTCOMES S. Y. B. PHARM (SEMESTER III & IV CBCS)

SEMESTER III

Course Code	Name of the Course	Course Outcomes
BP 301T	Pharmaceutical Organic Chemistry-II (Theory)	**Upon the completion of the course student shall be able to** 1. Develop a basic knowledge of various aromatic compound their nomenclature synthesis and properties, method of preparation, electrophilic and nucleophilic reaction. 2. Explain general principle and mechanism involved in organic reaction and discuss the reactivity, orientation and stability of organic reaction. 3. Understand the chemistry of fats and oils. 4. Understand the stereochemistry of polynuclear aromatic hydrocarbon and their importance. 5. Understand the stereochemistry of cycloalkane and their importance.
BP 305P	Pharmaceutical Organic Chemistry-II (Practical)	**Upon the completion of the course student shall be able to** 1. Student should be evaluate the quality of fats and oils y determining acid value, saponification value and iodine value. 2. Student should be able to synthesize the various organic compound and understand the reaction mechanism involve in synthesis. 3. Calculate the percentage yield of the product obtained by synthesis. 4. Purify organic compound by various procedure. 5. Apply recrystallization and stem distillation method for the purification of synthesize organic compound.

Course Code	Name of the Course	Course Outcomes
BP 302T	Physical Pharmaceutics- I (Theory)	**Upon completion of the course student will be able to** 1. Understand various physicochemical properties of drug molecules in designing, development and evaluation of various dosage forms. 2. Explain the chemical and physical phenomena that govern the in vivo and in vitro actions of pharmaceutical products. Demonstrate the skills and understanding of the principles, concepts of surface and interfacial tension and its measurement. 3. Acquire understanding of drug complexes, protein binding and their applications and explain the methods of detection of complexes. 4. Illustrate the knowledge of Solubility and Distribution Phenomenon and apply them in the pharmaceutical practices. Describe Physical principles of states of matter and phase rule. Compare and contrast between one, two & three component system 5. The leaner should be able to describe Fick's laws of diffusion, mechanism of drug dissolution and absorption.
BP 306P	Physical Pharmaceutics- I (Practical)	**Upon completion of the course student will be able to** 1. Operate different pharmaceutical laboratory instruments used in determining various physical properties such as surface tension, viscosity, adsorption and solubility. 2. Calculate critical solution temperature & effect of addition of electrolyte on CST of phenol water system. 3. Demonstrate the partition Coeffient and distribution phenomena between immiscible liquid phases. 4. The leaner should be able to calculate physical parameter such as stability constant, and critical micellar concentration. 5. Demonstrate miscible, partially miscible liquid and all practical aspect regarding solubility of liquid.
Course Code	Name of the Course	Course Outcomes
BP 303T	Pharmaceutical Microbiology (Theory)	**Upon completion of the course student will be able to** 1. Understand the importance and implementation of sterilization & disinfectant in

		pharmaceutical industry. 2. Know the general bacteriology & understand methods of identification, isolation, cultivation and preservation of bacteria& Virus. 3. Understand the designing of aseptic area and various methods of microbiological assay. 4. Know about the microbial spoilage and how to preserve the pharmaceutical product from microbial spoilage. 5. Understand the cell culture technology and its application in pharmaceutical industry.
BP 307P	Pharmaceutical Microbiology (Practical)	**Upon completion of the course student will be able to** 1. Perform staining of bacteria and identification. 2. Perform sub culturing of bacteria. 3. Isolate pure cultures of bacteria by various techniques. 4. Perform the microbial assay of antibiotics by various methods. 5. Perform the sterility testing of pharmaceuticals.
Course Code	Name of the Course	Course Outcomes
BP 304T	Pharmaceutical Engineering (Theory)	**Upon completion of the course student will be able to** 1. Explain the various unit operations used in Pharmaceutical industries. 2. Understand the material handling techniques 3. Perform various processes involved in the Pharmaceutical manufacturing process. 4. Explain the process of size separation, size reduction, heat exchangers, filters, centrifuge, dryers, filtration, evaporation 5. Appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.
BP 308P	Pharmaceutical Engineering (Practical)	**Upon completion of the course student will be able to** 1. Student should be Perform experiments related to unit operations Ball mill. 2. Student should be able to Construct the drying curve & determine the moisture content & loss on drying. 3. Describe the construction working application of pharmaceutical machinery such as rotary tablet machine, fluidized bed coater, fluid energy mill & dehumidifier. 4. Determine factors affecting the rate of filtration, evaporation & study the effect of

		time on the rate of crystallization. 5. Describe the construction working application of pharmaceutical machinery such as V- Cone blender, double cone blender, rotary drum filter, sieve shaker machine.
SEMESTER IV		
Course Code	Name of the Course	Course Outcomes
BP 401T	Pharmaceutical Organic Chemistry-III (Theory)	**Upon completion of the course student will be able to** 1. Understand stereoisomerism and racemic modification and configuration of chiral compound. 2. Understand the geometrical isomerism know about conformational isomerism. 3. Know what are heterocyclic compound and reaction and the method of synthesis. 4. Know what are polycyclic compound and reaction and the method of synthesis. 5. Understand reaction of synthesis importance.
Course Code	Name of the Course	Course Outcomes
BP 402T	Medicinal Chemistry- I (Theory)	**Upon completion of the course student will be able to** 1. Classify medicinal compounds according to their chemical structure. Identify the effect of physicochemical properties on biological action and drug metabolic pathways. 2. Explain the drug metabolic pathways, mode of action, adverse effects and therapeutic uses of drugs. 3. Understand the chemistry of drugs with respect to their pharmacological activity. 4. Discuss the Structural Activity Relationship (SAR) of different class of drugs. 5. Write the chemical synthesis of some drugs.
BP 406P	Medicinal Chemistry- I (Practical)	**Upon completion of the course student will be able to** 1. Understand how to make correct use of various equipments & take safety measures while working in medicinal chemistry laboratory. 2. Synthesize medicinal compounds. 3. Determine the amount of drug present in a sample. 4. Estimate purity of drugs.

		5. Estimate partition coefficient of drugs.
Course Code	Name of the Course	Course Outcomes
BP 403T	Physical Pharmaceutics- II (Theory)	**Upon completion of the course student will be able to** 1. Describe the reaction kinetics, rate, order and factors affecting the rate of reaction; prevent degradation, stabilization of drugs and shelf-life assessment and to explain the reaction kinetics of dosage forms. 2. Explain the types, properties, principles and applications of dispersion system in the formulations & explain the concept of formulation and stabilization of suspension and emulsions. 3. Explain the properties of particles and pharmaceutical powders, their significance in formulating pharmaceutical products and the common methods for characterizing these properties. 4. Illustrate fundamentals and pharmaceutical applications of rheology and their measurement in order to identify and choose suitable flow characteristics for the formulation & describe the thixotropic/stability of dispersions, semisolids systems and deformation of solids. 5. Explain the concept of formulation and stabilization of suspension and emulsions.
BP 407P	Physical Pharmaceutics- I (Practical)	**Upon completion of the course student will be able to** 1. Demonstrate microscopic and mircromeritics characteristics of dosage form. 2. The learner should be able to determine reaction rate constant, order of reaction for different reaction. 3. The learner should be able to predict shelf life by carrying out accelerated stability studies. 4. Calculate sedimentation volume of suspension. 5. The learner should be able to calculate physical parameter such as molecular weight of polymer.
Course Code	Name of the Course	Course Outcomes
BP 404T	Pharmacology- I (Theory)	**Upon completion of the course student will be able to**

		1. Explain the general principals of pharmacology. 2. Describe the pharmacokinetic, pharmacodynamic, adverse drug reactions and drug interactions. 3. Explain drug discovery and clinical evaluation of new drugs. 4. Explain the drugs acting on the peripheral nervous system. 5. Describe the drugs acting on the central nervous system.
BP 408P	Pharmacology- I (Practical)	**Upon completion of the course student will be able to** 1. Explain the commonly used instruments, laboratory animals used in experimental pharmacology. 2. Describe the maintenance of laboratory animals as per CPCSEA guidelines. 3. Explain the common laboratory techniques, blood withdrawal, serum and plasma separation, anesthetics, and euthanasia used for animal studies. 4. Understand the administration of the drug in mice/rats. 5. Explain the effect of the drug on the animal by simulated experiment.
Course Code	Name of the Course	Course Outcomes
BP 405T	Pharmacognosy & Phytochemistry- I (Theory)	**Upon completion of the course student will be able to** 1. Describe the scope and progress of Pharmacognosy in field of Pharmacy. 2. Explain the quality of natural origin crude drugs with various evaluation parameters. 3. Describe the role of herbal drugs in various traditional system of medicine along with their cultivation, collection and processing of natural origin drugs. 4. Role and application of Plant Tissue Culture techniques to understand the conservation of endangered species, improvement of crop and enhancement of secondary metabolites. 5. Elaborate the primary and secondary metabolites in plants along with description of each category.
BP 409P	Pharmacognosy & Phytochemistry- I (Practical)	**Upon completion of the course student will be able to** 1. To understand analysis of crude drug by chemical test.

		2. Demonstrate microscopic and mircromeritics characteristics of leaf. 3. Determination of size of starch grains, calcium oxalate crystals, length and width by eye piece micrometer. 4. Determination of ash value, extractive values of crude moisture content, swelling index and foaming index of crude drug. 5. Determination of number of starch grains by Lycopodium spore method.

COURSE OUTCOMES T. Y. B. PHARM (SEMESTER V & VI CBCS)

SEMESTER V

Course Code	Name of the Course	Course Outcomes
BP 501T	Medicinal Chemistry- II (Theory)	**Upon completion of the course student will be able to** 1. Understand detail aspects of Antihistaminic agents, Anticancer drugs along with classification, nomenclature, Synthesis, SAR, MoA, adverse effects, therapeutic uses. 2. Classify & explicate SAR, Mechanism of action, adverse effects and therapeutic uses of Drugs acting on CVS and Renal System. 3. To write the chemical synthesis, SAR, MoA, adverse effects, therapeutic uses of some classes of drugs. 4. Comprehend the Drugs acting on Endocrine system Nomenclature, Stereochemistry and metabolism of steroids. 5. Discuss the Classification, nomenclature, Stereochemistry, SAR and Mechanism of action and metabolism of Antidiabetic Agents and Local Anaesthetics.
Course Code	Name of the Course	Course Outcomes
BP 502T	Industrial Pharmacy- I (Theory)	**Upon completion of the course student will be able to** 1. Revise and apply the basic knowledge of preformulation parameters for the development of new formulations. 2. Understood the considerations in development of various pharmaceutical dosage forms and their manufacturing techniques. 3. Describe new concepts in pharmaceutical packaging and their control.

		4. Describe containers, valves and propellants for different types of aerosol systems. 5. Understand the concepts of Pelletization techniques & formulation strategies.
BP 506P	Industrial Pharmacy- I (Practical)	**Upon completion of the course student will be able to** 1. Practical exercises are designed to make the student relate the need for preformulation studies. 2. Practical exercises are designed to make the student relate the correct use of various equipments in Pharmaceutics laboratory. 3. To understand the Rational behind the evaluation of packaging material. 4. To understand rational behind use of formulation ingredients. 5. To understand the formulation & evaluation of different types of dosage forms.
Course Code	Name of the Course	Course Outcomes
BP 503T	Pharmacology- II (Theory)	**Upon completion of the course student will be able to** 1. Upon completion students will be able to explain the drugs acting on cardio vascular system. 2. Upon completion students will be able to describe the drugs acting on blood. 3. Upon completion students will be able to understand the drugs acting on urinary system. 4. Upon completion students will be able to explain the autocoids and drugs acting on endocrine system. 5. Upon completion students will be able to describe the principles, applications and types of bioassay.
BP 507P	Pharmacology- II (Practical)	**Upon completion of the course student will be able to** 1. Upon completion students will be able to explain the in-vitro pharmacology and physiological salt solutions. 2. Upon completion students will be able to explain the basic principles of bioassay, bioassay of various drugs. 3. Upon completion students will be able to describe the effect of drugs on various

		isolated animal preparations. 4. Upon completion students will be able to understand the preclinical screening of various drugs. 5. Upon completion students will be able to explain the effect of drug on animal by simulated experiment.
Course Code	Name of the Course	Course Outcomes
BP 504T	Pharmacognosy & Phytochemistry- II (Theory)	**Upon completion of the course student will be able to** 1. Discuss the general biosynthesis technique of phytoconstituents and formation of secondary metabolites in plants. 2. Describe the composition, chemistry, bio-sources, therapeutic uses and commercial applications of different plants secondary metabolites. 3. Demonstrate the Isolation, Identification and Analysis of various Phytoconstituents. 4. Elucidate the production, estimation and utilization of phytoconstituents in industrial scale. 5. Provide an overview on extraction, separation techniques along with estimation and analysis of the different phytoconstituents with help of instrument based on chromatography and spectroscopy.
BP 508 P	Pharmacognosy & Phytochemistry- II (Practical)	**Upon completion of the course student will be able to** 1. Identify and evaluate crude drug via morphological and microscopical characteristics. 2. Isolate and analyze the phytoconstituents from crude drugs. 3. Identify the crude drug by various chemical tests by observation. 4. Apply the theoretical knowledge of Thin Layer Chromatography and Paper Chromatography to perform the practicals. 5. Isolate and analyze the volatile oil.
Course Code	Name of the Course	Course Outcomes
BP 505 T	Pharmaceutical Jurisprudence (Theory)	**Upon completion of the course student will be able to** 1. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.

		2. Explain the drugs and cosmetics rules for import and manufacture of drugs. 3. Understand the code of ethics during the pharmaceutical practice. 4. Understand the basic and also about various Indian pharmaceutical Act and Laws. 5. Explain the National pharmaceutical pricing authority, prevention of cruelty to animals.
SEMESTER VI		
Course Code	Name of the Course	Course Outcomes
BP 601 T	Medicinal Chemistry- III (Theory)	**Upon completion of the course student will be able to** 1. Understand detail aspects of Antibiotics Historical background, Nomenclature, Stereochemistry, SAR, degradation, classification and important products of the following classes. β-Lactam antibiotics, Aminoglycosides, Tetracyclines. 2. Classify & explicate SAR, Mechanism of action, adverse effects and therapeutic uses of Antibiotics, Macrolide, Basic concepts and application of prodrugs design, Antimalarials. 3. To write the chemical synthesis, SAR, MoA, adverse effects, therapeutic uses of some classes of Anti-tubercular Agents, Urinary tract anti-infective agents, Antiviral agents. 4. Comprehend the Drugs acting on Fungal, Protozoal, Helminthiasis, Sulphonamides and Sulfones, folate reductase inhibitors. 5. Explain physico chemical properties related to QSAR and describe various approaches and designing of drug molecules including prodrug and Combinatorial chemistry.
BP 607 P	Medicinal Chemistry- III (Practical)	**Upon completion of the course student will be able to** 1. Understand how to make correct use of various equipments & take safety measures while working in a medicinal chemistry laboratory. 2. Synthesize, recrystallize and understand reaction mechanisms involved in the synthesis of medicinally important compounds and perform the Assay of drugs. 3. To study the interpretation of UV spectra of unknown drugs. 4. Comprehend the techniques of microwave-assisted synthesis and explain applications of microwave-assisted synthesis in pharmaceutical research. 5. Able to draw structures and reactions using Chem draw.

Course Code	Name of the Course	Course Outcomes
BP 602 T	Pharmacology- III (Theory)	**Upon completion of the course student will be able to** 1. Understand the mechanism of drug action and its relevance in the treatment of various infectious diseases. 2. Explain the principles of toxicology and treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences. 3. Explain the mechanism of various therapeutic drugs used for the treatment of several disorders or diseases in human being. 4. Achieve the greater therapeutic outcomes of various anti-biotic used against the infection of bacteria or virus in human being. 5. Understand the importance of time, dose, duration and day of administration of several therapeutic drugs to improve the efficacy for better compliance of a patient.
BP 608 P	Pharmacology- III (Practical)	**Upon completion of the course student will be able to** 1. Calculate the dose of different drugs in different pharmacological experiments. 2. Calculate the lethal dose of different drugs from any given data. 3. Know the irritation producing substances to human body. 4. Calculate the pharmacokinetic parameters from any different category of drug. 5. Know the biostatistics method for the purpose of research methodology.
Course Code	Name of the Course	Course Outcomes
BP 603 T	Herbal Drug Technology (Theory)	**Upon completion of the course student will be able to** 1. Discuss the crude drug raw material as source of herbal drugs by cultivation process and knowledge of traditional system of medicine. 2. Discuss the role of Nutraceuticals in treatment of various diseases along with Herbal-Drug & Herb-Food interaction. 3. Discuss the role of natural excipients in Herbal formulation and cosmetics. 4. Discuss the Patenting aspects, Regulatory Issues and WHO & ICH guidelines for the evaluation and assessment of Traditional drugs and Natural Products. 5. Discuss the general introduction to Herbal & Good Manufacturing Practices of Indian System of Medicine.

BP 609 P	Herbal Drug Technology (Practical)	**Upon completion of the course student will be able to** 1. Identify the crude drug by various chemical tests by observation. 2. Evaluation of natural origin excipients. 3. To prepared and standardized prepared formulation of natural origin extract. 4. To study and analyzed the herbal drugs as per standard Pharmacopoeias. 5. To determine the herbal drug by standard parameters.
Course Code	Name of the Course	Course Outcomes
BP 604 T	Biopharmaceutics and Pharmacokinetics (Theory)	**Upon completion of the course student will be able to** 1. Explain the concept of biopharmaceutics and pharmacokinetics its applications in formulation development. 2. Ability to design and perform *in-vitro* dissolution studies for various drugs as per the standards of official monographs. 3. Able to understand compartmental models and non-compartmental analysis methods. 4. Able to understand the pharmacokinetic processes and their relevance to the inefficacy of dosage form. 5. Explain the concept and mechanisms of dissolution and in vitro in vivo correlation.
BP 605 T	Pharmaceutical Biotechnology (Theory)	**Upon completion of the course student will be able to** 1. Understand current applications of biotechnology and advances in the different areas like medical, microbial, environmental, bioremediation, rDNA technology, agricultural, plant, animal, and forensic. 2. Understand the concept of enzymes and their uses by immobilization. 3. Describe in detail about fermentor, Production of certain products by fermentation process. 4. Understand mechanism of immunity and various antigen-antibody reactions with their application. 5. Describe about genetic recombination, mutation and its types in bacteria.

BP 606 T	Quality Assurance (Theory)	**Upon completion of the course student will be able to** 1. Students understand the importance of quality in pharmaceutical products, various philosophies, and concept of quality. 2. Understand the importance of good practices that are implemented in industries like GMP, GLP, NABL. 3. Understand the regulatory aspects needed in pharmaceutical industries like ICH, ISO, FDA. 4. Know about various manufacturing process, validation, calibration and quality control test of various dosage forms. 5. Understand and know various documentation process and record included in pharmaceutical industry.

COURSE OUTCOMES F. Y. B. PHARM (SEMESTER VII & VIII CBCS)

SEMESTER VII

Course Code	Name of the Course	Course Outcomes
BP701T	Instrumental Methods Of Analysis (Theory)	**Upon completion of the course student will be able to** 1. Understand the interaction of matter with electromagnetic radiation and its applications in drug analysis. 2. Explain the theoretical principle, instrumentation, working and application of UV-visible, IR & Atomic absorption spectroscopy. 3. Explain Basic principle, Instrumentation, Applications & factors affecting different analytical techniques like Fluorimetry, Flame photometry & Nepheloturbidometry. 4. Understand the separation of compounds by various chromatographic techniques & able to explain instrumentation, separation and identification of compounds by column chromatography, TLC, paper chromatography & electrophoresis technique. 5. Explain theory and instrumentation of GC, HPLC, gel chromatography, ion exchange chromatography and affinity chromatography & learn applications of various chromatographic techniques for organic, inorganic and natural products.
BP705P	Instrumental Method Of Analysis	**Upon completion of the course student will be able to**

	(Practical)	1. Develop the knowledge of take appropriate safety measures while handling and develop basic practical skills in instrumental techniques. 2. Understand operation and calibration of various analytical instruments for assay and interpretation of various drug molecules as per pharmacopoeial standards. 3. Understand the chromatographic separation and analysis of drugs. 4. Understand the basic knowledge on assay of single and multiple components pharmaceuticals using various analytical instruments. 5. Understand the determination and estimations of various drug molecules by colorimetry, flame photometry, nepheloturbidimetry.
Course Code	Name of the Course	Course Outcomes
BP702T	Industrial Pharmacy-II (Theory)	**Upon completion of the course student will be able to** **1.** Know the process of pilot plant and scale up of pharmaceutical dosage forms. **2.** Understand the process of technology development and transfer from lab scale to commercial batch. **3.** Know different Laws and Acts that regulate pharmaceutical industry. **4.** Understand the concept of quality management systems. **5.** Understand the approval process and regulatory requirements for drug products.
Course Code	Name of the Course	Course Outcomes
BP703T	Pharmacy Practice (Theory)	**Upon completion of the course student will be able to** 1. Explain the organisation and management of hospital and hospital pharmacy with ADR (adverse drug reaction). 2. Explain the drug distribution system, guidelines and patient counselling system of hospital. 3. Explain the education, training programmes and communication skills in hospital. 4. Explain the budget preparation, management and implementation of hospital. 5. Explain the drug store management and its inventory control system of hospital.
Course Code	Name of the Course	Course Outcomes
BP704T	Novel Drug Delivery System	**Upon completion of the course student will be able to**

	(Theory)	1. Describe the concept of novel drug delivery system & selection of drug candidates, along with the classification & applications of polymers. 2. Explain the concept of microencapsulation, along with its types, advantage, disadvantage & applications. 3. Apply knowledge in developing various novel formulations & devices. 4. Analyse various evaluation parameters for various novel formulations & devices. 5. Understand the concepts and applications of Targeted Drug Delivery Systems.
Course Code	Name of the Course	Course Outcomes
BP706PS	Practice School	**Upon completion of the course student will be able to** 1.
SEMESTER VIII		
Course Code	Name of the Course	Course Outcomes
BP801T	Biostatistics & Research Methodology (Theory)	**Upon completion of the course student will be able to** 1. To understand the basic aspects of statistics and applications of Bio-statics in Pharmacy. 2. To know the use of regression and probability while analyzing data by statistical methods. 3. To perform various parametric and non parametric statistical tests and to draw graphs, write report and present data. 4. To know about the blocking, confounding system, regression modeling and the application of statistical soft wares, M.S. Excel, SPSS, DoE ect., to build up the ability to solve various statistical problems. 5. To explain the need of research, clinical research design, design and analysis of experiments.
Course Code	Name of the Course	Course Outcomes
BP 802T	Social and Preventive Pharmacy (Theory)	**Upon completion of the course student will be able to** 1. Acquire Knowledge and realization about public health and social health in society also know ways to promote health and hygiene in society. 2. Students understand various communicable and non-communicable disease and their Preventive measures.

		3. Students gain Knowledge about various national health Programs under government of India for various diseases. 4. Students know about health Programs for mother, child, elderly to promote social health. 5. Able to recognize about community Pharmacist duties to promote rural, urban, school health.
Course Code	Name of the Course	Course Outcomes
BP-803ET	Pharmaceutical Marketing Management (Theory)	1. The Learner will be able to know basic concepts of Marketing , prescription habits of Physicians and market research. 2. The Lerner would be able to know about the product line,PLC, management decisions. 3. The Lerner would be able to know about Product Promotional Mix and different techniques for Pharmaceutical and OTC products, in Pharmaceutical Industry. 4. The Lerner would be able to know about various marketing channels, physical distribution management and duties of a professional Sales Representative. 5. The Lerner would be able to know about pricing methods and strategies , issues related to pricing and DPCO , NPPA and emerging concepts in marketing of pharmaceutical products.
Course Code	Name of the Course	Course Outcomes
BP-809ET	Cosmetic Science (Theory)	1. Classify & define cosmetics &cosmeceuticals as per Indian & EU regulations. 2. They describe the role of cosmetics excepients& building blocks in formulations of cosmetics 3. They should explain the structure & functions of skin, hair, teeth & gums. 4. They describe the fundamentals of sun projection & the formulation of sunscreens, antiperspirants &deodrants. 5. They design & formulate cosmetics for skin care & hair care& oral care.

***Non University Examination (NUE)**

HI TECH COLLEGE OF PHARMACY,

NAGPUR HIGHWAY, PADOLI PHATA, CHANDRAPUR

ACADEMIC YEAR 2021-2022

COURSE OUTCOMES F. Y. M. PHARM (SEMESTER I & II CBCS)

PHARMACOGNOSY		
SEMESTER I		
Course Code	Name of the Course	Course Outcomes
MPG 101T	Modern Pharmaceutical Analytical Technique (Theory)	**Upon the completion of the course student shall be able to** 1. Understand the basic concepts and advances in analytical techniques and theoretical skills of the analytical instruments 2. The analysis of various drugs in single and combination dosage forms. 3. Understand advanced analytical instrumental techniques for identification, characterization and quantification of drugs. 4. To understand theoretical and practical skills of the instruments 5. Knowledge for characterization of a drug
Course Code	Name of the Course	Course Outcomes
MPG 102T	Advanced Pharmacognosy – I (Theory)	**Upon completion of the course student will be able to** 1. Knowledge about cultivation of medicinal plants and different guidelines related to cultivation 2. Marine drug discovery and study of marine natural products. 3. Scope, medicinal value and standardization of nutraceuticals and regulatory aspect of neutraceuticals 4. Occurrence, isolation, characterization, identification, biosynthesis and activity profile of biologically active natural products. 5. WHO guideline study for quality and safety monitoring of herbal drugs and study

		about herb drug, food drug interaction and adverse effect of herbals.
Course Code	Name of the Course	Course Outcomes
MPG 103T	Phytochemistry (Theory)	**Upon completion of the course student will be able to** 1. Biogenesis and biological activity of natural products. Extraction, Isolation, Characterization and purification of phyto-pharmaceuticals containing drugs. 2. Herbal Drug discovery and development. Optimization of Lead compounds. 3. Extraction, purification and Phytochemical studies analysis of Natural products. 4. Application of HPTLC and GC technique in fingerprinting, analysis and identification of phytoconstituents. 5. Role of by spectroscopic techniques like UV, IR, MS, NMR in Structure elucidation of phytoconstituents of herbal extracts.
Course Code	Name of the Course	Course Outcomes
MPG 104T	Industrial Pharmacognostical Technology (Theory)	**Upon completion of the course student will be able to** 1. Starting up of new herbal drug industry. Regulatory requirements/ documentation Pilot plant scale –up techniques. Formulation and production management of herbals. 2. Regulatory requirements for starting a new natural drug industry. ISO documentation and Export and import policies in herbal industry sector. GMP / GLP in Herbal drug sector. 3. Monograph preparation and documentation of herbal drugs and extracts. WHO guidelines in safety assessment of herbal drugs. 4. Testing & protocol of natural products and drugs. 5. Develop skill in testing of herbal drugs and Knowledge about IPR and Patenting.6
Course Code	Name of the Course	Course Outcomes
MPG 105P	Pharmacognosy Practical – I (Practical)	**Upon completion of the course student will be able to** 1. Various methods of extraction and their screening. 2. Monograph analysis of various phytoconstituents. 3. Formulation and standardization of various dosage forms.

		4. Analysis of Pharmacopoeial compounds of natural origin and their formulations by various spectrophotometer analytical methods. 5. Identification and development of fingerprint of medicinal plant extract.
SEMESTER II		
Course Code	Name of the Course	Course Outcomes
MPG 201T	Medicinal Plant Biotechnology (Theory)	**Upon completion of the course student will be able to** 1. Demonstrate knowledge on development of plant biotechnology as a source of medicinal agents along with various biotechnological tools suitable for Pharmaceutical sciences. 2. Develop skills in various tissue culture techniques and sterilization methods involved in it along with their application. 3. Different Immobilization techniques and methods of cloning and its applications. Secondary metabolite production from medicinal plants. 4. To know about biotransformation and its types along with various bioreactors in cell culture. Application of PCR in plant analysis. 5. Plant fermentation technology in production of secondary metabolites.
Course Code	Name of the Course	Course Outcomes
MPG 202T	Advanced Pharmacognosy – II (Theory)	**Upon completion of the course student will be able to** **1.** Students will study the toxicity and regulations of herbal Vs conventional drugs. **2.** Discuss the therapeutic actions of main classes of phytochemical and their interactions with other herbs or drugs and become familiar with DNA fingerprinting techniques. **3.** Students will study the role of ethno botany and ethno pharmacology in drug development. **4.** Develop analytical profile of different classes of phytochemicals. **5.** Students will study the biological screening of herbal drugs and related guidelines.
Course Code	Name of the Course	Course Outcomes
MPG 203T	Indian system of medicine(Theory)	**Upon completion of the course student will be able to**

		1. Students learned about to know the various traditional Indian system of medicine. 2. Understand basic principles of various Indian system of medicines. 3. Students learned to know about the clinical research of traditional medicines. 4. Know about current good manufacturing practice of Indian system of medicine and their formulations. 5. Know about the various governments regulatory authorities for various Indian system of medicines.
Course Code	Name of the Course	Course Outcomes
MPG 204T	Herbal Cosmetics (Theory)	**Upon completion of the course student will be able to** 1. Students will study the guidelines and regulations of herbal cosmetics. 2. Discuss the basic principles of various herbal/natural cosmetic preparations. 3. Students will study the raw material & finished products of herbal cosmetics. 4. Develop analytical profile of natural cosmetic preparation as per the regulatory authorities. 5. Students will study the toxicity screening of herbal drugs and related guidelines.
Course Code	Name of the Course	Course Outcomes
MPG 205P	Pharmacognosy Practical-II (Practical)	**Upon completion of the course student will be able to** 1. Preparation of herbal cosmetic formulation. 2. Standardization of formulated herbal content formulations. 3. Determination and estimation of herbal drug by standard parameters. 4. Establishment of various Plant Tissue Culture. 5. Immobilization technique and isolation of RNA.
PHARMACEUTICS		
SEMESTER I		
Course Code	Name of the Course	Course Outcomes
MPH 101T	Modern Pharmaceutical Analytical Technique (Theory)	**Upon the completion of the course student shall be able to** 1. Understand the basic concepts and advances in analytical techniques and theoretical

		skills of the analytical instruments 2. The analysis of various drugs in single and combination dosage forms. 3. Understand advanced analytical instrumental techniques for identification, characterization and quantification of drugs. 4. To understand theoretical and practical skills of the instruments 5. Knowledge for characterization of a drug
Course Code	Name of the Course	Course Outcomes
MPH 102 T	Drug Delivery System (Theory)	**Upon completion of the course student will be able to** 1. Understand the Principles & Fundamentals in development on controlled drug delivery systems. 2. Understand the different types of Drug carrier used in the process of drug delivery and various approaches for development of drug delivery systems. 3. Explain approaches, formulations, technologies, and systems for transporting a pharmaceutical compound in the body as needed to safely achieve its desired therapeutic effect with suitable drug delivery. 4. Understand developments in protein and peptide for parenteral delivery approaches will give new dimension of drug deliver for antibiotics, insulin, etc. 5. Understand Vaccine delivery and different mode of application approach for clinical use.
Course Code	Name of the Course	Course Outcomes
MPH 103T	Modern Pharmaceutics (Theory)	**Upon completion of the course student will be able to** 1. Knowledge on preformulation concepts and optimization techniques. 2. Knowledge on pharmaceutical validation 3. Knowledge on cGMP & Industrial Management. 4. Knowledge on compression and compaction 5. Knowledge on consolidation parameters.
Course Code	Name of the Course	Course Outcomes
MPH 104 T	Regulatory Affairs	**Upon completion of the course student will be able to**

	(Theory)	1. Understand The Concepts of innovator, generic drugs and drug development process. 2. Understand the Regulatory guidance's and guidelines for filing and approval process. 3. Understand the Preparation of Dossiers and their submission to regulatory agencies in different countries. 4. Know about the Post approval regulatory requirements for actives and drug products and Submission of global documents in CTD/ eCTD formats. 5. Know about the clinical trials requirements for approvals, conducting clinical trials, process of monitoring clinical trials and about pharmacovigilance.
Course Code	Name of the Course	Course Outcomes
MPH 105 P	Pharmaceutics Practical-I (Practical)	**Upon completion of the course student will be able to** **1.**
SEMESTER II		
Course Code	Name of the Course	Course Outcomes
MPH 201 T	Molecular Pharmaceutics (Theory)	**Upon completion of the course student will be able to** **1.**
Course Code	Name of the Course	Course Outcomes
MPH202T	Advanced Biopharmaceutics & Pharmacokinetics (Theory)	**Upon completion of the course student will be able to** 1. The drug absorption from GIT. 2. The Bio pharmaceutical Considerations in Drug Product design. 3. The Pharmacokinetic models and parameters that best describe the process of ADME. 4. The critical evaluation of bio-pharmaceutics studies involving drug product equivalency. 5. The potential clinical pharmacokinetic problems and applications of pharmacokinetics.
Course Code	Name of the Course	Course Outcomes
MPH 203T	Computer Aided Drug Delivery System (Theory)	**Upon completion of the course student will be able to** 1.
Course Code	Name of the Course	Course Outcomes
MPH 204T	Cosmetics & Cosmeceuticals (Theory)	**Upon completion of the course student will be able to** 1.

Course Code	Name of the Course	Course Outcomes
MPH 205T	Pharmaceutics Practicals-II (Practicals)	**Upon completion of the course student will be able to** 1.

COURSE OUTCOMES S. Y. M. PHARM (SEMESTER III)

SEMESTER III

Course Code	Name of the Course	Course Outcomes
MRM 301T	Research Methodology & Biostatistics (Theory)	**Upon completion of the course student will be able to** **1.** Learn general research methodology and develop the ability to apply the methods while working on a research project work. **2.** Understand the concepts of biostatistics and Learn different parametric and non-parametric tests. **3.** Explain the guidelines and importance of medical research and understand the functions of ethics committees in medical research. **4.** Learn the guidelines for developing animal facilities. **5.** Understand the genesis of bioethics with special reference to Helsinki declaration.