**Program Outcomes (POs)**

**PO1.** Pharmacy knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioural, social, and administrative pharmacy sciences; and manufacturing practices.

**PO2.** 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.

**PO3.** Design/development of solutions: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

**PO4.** Conduct investigations of complex problems: Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5.** Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

**PO6.** The Pharmacist and Society: Apply reasoning informed by the contextual knowledge to assess social, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice

**PO7.** Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustain able development.

**PO8.** Pharmaceutical Ethics: Honor 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

**PO9.** Individual and team work: Function effectively as an individual, and as a member or leader in teams, and gain multidisciplinary knowledge through innovative projects, industrial training.

**PO10.** 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.

**PO11.** Project management and finance: Demonstrate knowledge and understanding of Pharmacy and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

**PO12.** 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-access and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

**B. Pharmacy 1st Sem**

**Subject Code: BP101T**

**Title of the course: HUMAN ANATOMY AND PHYSIOLOGY-I (Theory)**

**Course Outcomes:**

This subject is designed to impart fundamental knowledge on the structure and Functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms and their imbalances. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

Upon completion of this course the student should be able to:

**CO 1:** Explain the gross morphology, structure and functions of various organs of the human Body.

**CO2.** Describe the various homeostatic mechanisms and their imbalances.

**CO3.** Identify the various tissues and organs of different systems of human body.

**CO4:** Perform the various experiments related to special senses and nervous system

**Subject Code: BP107P**

**Title of the course: HUMAN ANATOMY AND PHYSIOLOGY (Practical)**

**Course Outcomes:**

**CO1:** Practical physiology is complimentary to the theoretical discussions in Physiology.

**CO2:** Practicals allow the verification of physiological processes discussed in theory classes through experiments on living tissue, intact animals or normal human beings.

**CO3:** This is helpful for developing an insight on the subject.

**Subject Code:** **BP102T**

**Title of the course:** **PHARMACEUTICAL ANALYSIS – I (Theory)**

**Course Outcomes:**

This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs.

Upon completion of this course the student should be able to:

**CO 1:** Understand the principles of volumetric and electro chemical analysis

**CO2:** Carryout various volumetric and electrochemical titrations

**CO3:** Develop analytical skills

**Subject Code:** **BP108P**

**Title of the course:** **PHARMACEUTICAL ANALYSIS-I(Practical)**

**Course Outcomes:**

**CO1:** Prepare primary and secondary standard solution.

**CO2:** Perform standardization of secondary standard solutions.

**CO3:** Determine percentage purity of given pharmaceutical drugs by titrimetric analysis.

**Subject Code:** **BP103T**

**Title of the course:** **PHARMACEUTICS- I (Theory)**

**Course Outcomes:**

This course is designed to impart a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms.

Upon completion of this course the student should be able to:

**CO1:** Know the history of profession of pharmacy

**CO2:** Understand the basics of different dosage forms, pharmaceutical Incompatibilities and pharmaceutical calculations

**CO3:** Understand the professional way of handling the prescription

**CO4:** Preparation of various conventional dosage forms

**Subject Code:** **BP109P**

**Title of the course:** **PHARMACEUTICS- I(Practical)**

**Course Outcomes:**

**CO1:** Explain formulation and labelling of different pharmaceutical dosages forms.

**CO2:** Describe use of ingredients in formulation and category of formulation.

**CO3:** Compare various monophonic preparations depending upon their formulation.

**Subject Code:** **BP104T**

**Title of the course:** **PHARMACEUTICAL INORGANIC CHEMISTRY (Theory)**

**Course Outcomes:**

This subject deals with the monographs of inorganic drugs and pharmaceuticals. Upon completion of this course the student should be able to:

**CO1:** Know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals.

**CO2:** Understand the medicinal and pharmaceutical importance of inorganic Compounds.

**Subject Code:** **BP110P**

**Title of the course:** **PHARMACEUTICAL INORGANIC CHEMISTRY (Practical)**

**Course Outcomes:**

**CO1:** Analyse the impurities of different pharmaceutical dosages forms.

**CO2:** Describe use of ingredients in pharmaceutical dosages forms.

**CO3:** Explain the monographs of various pharmaceutical dosages forms.

**Subject Code: BP105T**

**Title of the course: Communication Skills (Theory)**

**Course Outcomes:**

This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other health workers. At the end of this course the

student will get the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.

Upon completion of the course the student shall be able to

**CO1:** Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation

**CO2:** Communicate effectively (Verbal and Non-verbal)

**CO3:** Effectively manage the team as a team player

**CO4:** Develop interview skills, Develop Leadership qualities and essentials

**Subject Code : BP111P**

**Title of the course : COMMUNICATION SKILLS (Practical)**

**Course Outcomes:**

**CO1:** Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation

**CO2:** Communicate effectively (Verbal and Non Verbal)

**CO3:** Effectively manage the team as a team player

**CO4:** Develop interview skills, Develop Leadership qualities and essentials

**Subject Code : BP 106RBT**

**Title of the course : REMEDIAL BIOLOGY (Theory)**

**Course Outcomes:**

This is an introductory course in Biology. This subject deals with the introduction to learn and understand the components of living world, structure and functional system of plant and animal kingdom.

Upon completion of the course the student shall be able to:-

**CO1:** Know the classification and salient features of five kingdoms of life

**CO2:** Understand the basic components of anatomy & physiology of plant

**CO3:** Know understand the basic components of anatomy & physiology animal with special reference to human

**Subject Code : BP112RBP**

**Title of the course : REMEDIAL BIOLOGY (Practical)**

**Course Outcomes:**

**CO1:** Explain functioning of different types of Microscopes.

**CO2:** Describe the function of cell and tissues.

**CO3:** Introduction to various equipments and techniques use to check different body part functions.

**Subject Code: BP 106RMT**

**Title of the course: REMEDIAL MATHEMATICS**

**Course Outcomes:**

This is an introductory course in mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform.

Upon completion of the course the student shall be able to:-

**CO1:** Know the theory and their application in Pharmacy

**CO2:** Solve the different types of problems by applying theory

**CO3:** Appreciate the important application of mathematics in Pharmacy

**B. Pharmacy 2nd Sem**

**Subject Code: BP201T**

**Title of the course: HUMAN ANATOMY AND PHYSIOLOGY-II (Theory)**

**Course Outcomes**:

This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

Upon completion of this course the student should be able to:

**CO1:** Explain the gross morphology, structure and functions of various organs of the human body.

**CO2:** Describe the various homeostatic mechanisms and their imbalances.

**CO3:** Identify the various tissues and organs of different systems of human body.

**Subject Code:** **BP 207P**

**Title of the course:** **HUMAN ANATOMY AND PHYSIOLOGY-II (Practical)**

**Course Outcomes:**

**CO1:** Practicals allow the verification of physiological processes through experiments on normal human beings.

**CO2:** To study various systems of human body using specimen, models, charts etc.

**Subject Code:** **BP202T**

**Title of the course:** **PHARMACEUTICAL ORGANIC CHEMISTRY –I (Theory)**

**Course Outcomes:**

This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs

Upon completion of this course the student should be able to:

**CO1:** Write the structure, name and the type of isomerism of the organic compound

**CO2:** Write the reaction, name the reaction and orientation of reactions

**CO3:** Account for reactivity/stability of compounds

**CO4:** Identify/confirm the identification of organic compound

**Subject Code:** **BP208P**

**Title of the course:** **PHARMACEUTICAL ORGANIC CHEMISTRY-I (Practical)**

**Course Outcomes:**

**CO1:** Detect the extra elements present in compounds.

**CO2:** Identify organic compounds by systemic qualitative analysis.

**CO3:** Determine the boiling point and melting point of organic compounds.

**CO4:** Construct molecular models of compounds using atomic model set.

**Subject Code:** **BP203T**

**Title of the course:** **BIOCHEMISTRY –THEORY**

**Course Outcomes:**

This subject deals with complete understanding of the molecular levels of the chemical process associated with living cells. The scope of the subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions. It is also emphasizing on genetic organization of mammalian genome and hetero & autocatalytic functions of DNA.

Upon completion of course student shell able to

**CO1:** Understand basics like chemistry, function, classification, biological importance, qualitative tests & applications of various biomolecules. E.g. proteins, carbohydrates and lipids, etc.

**CO2:** Understand role of biochemical processes and cell metabolism.

**CO3:** Clarify the enzyme structures, their functions, mechanism for enzymatic activity and applications of enzymes.

**CO4:** Understand the metabolism of nutrient molecules in physiological and pathological conditions.

**Subject Code:** **BP209P**

**Title of the course:** **BIOCHEMISTRY (Practical)**

**Course Outcomes:**

Upon completion of the course the student shall be able to:-

**CO1:** Detect and identify proteins, amino acids and carbohydrates by various qualitative as well as quantitative tests.

**CO2:** Separate, identify and characterize proteins from various samples like egg, milk, etc and understand principle behind the technique

**CO3:** Demonstrate action of salivary amylase on starch.

**Subject Code:** **BP204T**

**Title of the course: PATHOPHYSIOLOGY (Theory)**

**Course Outcomes:**

Pathophysiology is the study of causes of diseases and reactions of the body to such disease producing causes. This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.

Upon completion of the subject student shall be able to –

**CO1:** Describe the etiology and pathogenesis of the selected disease states;

**CO2:** Name the signs and symptoms of the diseases; and

**CO3:** Mention the complications of the diseases.

**Subject Code: BP205T**

**Title of the course: COMPUTER APPLICATIONS IN PHARMACY(Theory)**

**Course Outcomes:**

This is an introductory course in Computer application. This subject deals with the introduction Database, Database Management system, computer application in clinical studies and use of databases.

Upon completion of the course the student shall be able to:-

**CO1:** Know the various types of application of computers in pharmacy

**CO2:** Know the various types of databases

**CO3:** Know the various applications of databases in pharmacy

**Subject Code: BP210P**

**Title of the course: COMPUTER APPLICATIONS IN PHARMACY(Practical)**

**Course Outcome:**

**CO1:** Describe how to create a database in MS Access

**CO2:** Describe how to design a form in MS Access

**CO3:** Introduction to MS word, MS excel, MS power point etc.

**Subject Code:** **BP206T**

**Title of the course:** **ENVIRONMENTAL SCIENCES (Theory)**

**Course Outcomes:**

Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.

Upon completion of the course the student shall be able to:

**CO1:** Create the awareness about environmental problems among learners.

**CO2:** Impart basic knowledge about the environment and its allied problems.

**CO3:** Motivate learner to participate in environment protection and environment improvement.

**CO4:** Acquire skills to help the concerned individuals in identifying and solving environmental problems

**B. Pharmacy 3rd Sem**

**Subject Code:** **BP 301T**

**Title of the course:** **PHARMACEUTICAL ORGANIC CHEMISTRY–II (Theory)**

**Course Outcomes:**

This subject deals with general methods of preparation and reactions of some organic compounds. Reactivity of organic compounds is also studied here. The syllabus emphasizes on mechanisms and orientation of reactions. Chemistry of fats and oils are also included in the syllabus.

Upon completion of the course the student shall be able to:-

**CO1:** Write the structure, name and the type of isomerism of the organic compound

**CO2:** Write the reaction, name the reaction and orientation of reactions

**CO3:** Account for reactivity/stability of compounds,

**CO4:** Prepare organic compounds

**Subject Code:** **BP305P**

**Title of the course:** **PHARMACEUTICAL ORGANIC CHEMISTRY-II (Practical)**

**Course Outcomes:**

Upon completion of the course the student shall be able to:-

**CO1:** Write the structure, name and the type of isomerism of the organic compound

**CO2:** Write the reaction, name the reaction and orientation of reactions

**CO3:** Account for reactivity/stability of compounds,

**CO4:** Prepare organic compounds

**Subject Code:** **BP302T**

**Title of the course:** **PHYSICAL PHARMACEUTICS- I (Theory)**

**Course Outcomes:**

The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosageforms.

Upon the completion of the course student shall be able to:

**CO1:** Understand various physicochemical properties of drug molecules in the Designing the dosage forms

**CO2:** Know the principles of chemical kinetics & to use them for stability testing and Determination of expiry date of formulations

**CO3**: Demonstrate use of physicochemical properties in the formulation development

**CO4:** Evaluation of dosage forms.

**Subject Code:** **BP306P**

**Title of the course:** **PHYSICAL PHARMACEUTICS- I (Practical)**

**Course Outcomes:**

**CO1:** Explain solubility of drug at different temperatures andto interpret scientific data, represent the data in a tabular and/or graphical form.

**CO2:** Determine the effect of temperature, pH, solvent, co-solvent on solubility

**CO3:** Calculate critical solution temperature & effect of addition of electrolyte on CST of Phenol-water system, solubility, partition coefficient, molecular weight, heat of solution of given compound.

**Subject Code: BP 303T**

**Title of the course: PHARMACEUTICAL MICROBIOLOGY (Theory)**

**Course Outcomes:**

This course is designed to impart a fundamental knowledge on the broadest sense, scope of microbiology is the study of all organisms that are invisible to the naked eye- that is the study of microorganisms, Microorganisms are necessary for the production of bread, cheese, beer, antibiotics, vaccines, vitamins, enzymes etc.

Upon completion of this course the student should be able to:

**CO1:** Understand methods of identification, cultivation and preservation of various microorganisms

**CO2:** Importance of sterilization in microbiology and pharmaceutical industry

**CO3:** Learn sterility testing of pharmaceutical products and microbiological standardization of pharmaceuticals.

**CO4:** Understand the cell culture technology and its applications in pharmaceutical industries.

**Subject Code: BP 307P**

**Title of the course: PHARMACEUTICAL MICROBIOLOGY (Practical)**

**Course Outcomes:**

**CO1:** Introduction and study of different equipments and processing used inexperimental microbiology

**CO2:** Introduction to different methods of Sterilization used in microbiology and pharmaceutical industry

**CO3:** Describe different methods for preparation of culture and sub culture

**CO4:** Sterility testing of pharmaceutical products and microbiological standardization of pharmaceuticals.

**Subject Code:** **BP 304T**

**Title of the course:** **PHARMACEUTICAL ENGINEERING (Theory)**

**Course Outcomes:**

This course is designed to impart a fundamental knowledge on the art and science of various unit operations used in pharmaceutical industry.

Upon completion of the course student shall be able:

**CO1:** To know various unit operations used in Pharmaceutical industries.

**CO2:** To perform various processes involved in pharmaceutical manufacturing process.

**CO3:** To carry out various tests to prevent environmental pollution.

**CO4:** To appreciate and comprehend significance of plant lay out design for optimum use of resources.

**Subject Code:** **BP308P**

**Title of the course:** **PHARMACEUTICAL ENGINEERING (Practical)**

**Course Outcomes:**

This course is designed to impart a fundamental knowledge on the art and science of various unit operations used in pharmaceutical industry.

Upon completion of the course student shall be able:

Study the different materials used in the pharmaceutical plant constructions.

**CO1:** Emphasize principles, mechanisms and theories of different unit operations. CO2: Describe types of distillation, their mechanisms with appropriate diagrams. CO3: Define drying and classify different types of dryers.

**B. Pharmacy 4th Sem**

**Subject Code:** **BP401T**

**Title of the course:** **PHARMACEUTICAL ORGANIC CHEMISTRY-III (Theory)**

**Course Outcomes:**

Scope: This subject imparts knowledge on stereo-chemical aspects of organic compounds and organic reactions, important named reactions, chemistry of important hetero cyclic compounds. It also emphasizes on medicinal and other uses of organic compounds.

At the end of the course, the student shall be able to

**CO1.** Understand the methods of preparation and properties of organic compounds

**CO2.** Explain the stereo chemical aspects of organic compounds and stereo chemical reactions

**CO3.** Know the medicinal uses and other applications of organic compounds

**Subject Code: BP402T**

**Title of the course: MEDICINAL CHEMISTRY-I (Theory)**

**Course Outcomes**:

This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physiochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

Upon completion of this course the student should be able to:

**CO1:** Understand the chemistry of drugs with respect to their pharmacological activity.

**CO2:** Understand the drug metabolic pathway, adverse effects and therapeutic value of drugs.

**CO3:** Know the structure activity relationship of different class of drugs

**CO4:** Study the chemical synthesis of selected drugs.

**Subject Code: BP406P**

**Title of the course: MEDICINAL CHEMISTRY-I(Practical)**

**Course Outcomes:**

**CO1:** Synthesize medicinal compounds.

**CO2:** Estimation of partition coefficient of drugs.

**CO3:** Estimate purity of drug.

**Subject Code: BP403T**

**Title of the course: PHYSICAL PHARMACEUTICS- II (Theory)**

**Course Outcomes:**

The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.

Upon the completion of the course student shall be able to:

**CO1:-** Understand various physicochemical properties of drug molecules in the designing the dosage forms

**CO2:-** Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations

**CO3:-** Demonstrate use of physicochemical properties in the formulation

**CO4:-** Development and evaluation of dosage forms.

**Subject Code: BP407P**

**Title of the course: PHYSICAL PHARMACEUTICS- II (Practical) Course Outcomes:**

**CO1:** Evaluate surface tension, visCOity, specific surface area, particle size distribution of given material

**CO2:** Develop skills and techniques those are parts of pharmaceutical procedures through the actual use of equipment and instruments. Clarify theoretical concepts learned in physical pharmaceutics-II

**CO3:** To interpret scientific data, represent the data in a tabular and/or graphical form

**Subject Code: BP404T**

**Title of the course: PHARMACOLOGY-1(Theory)**

**Course Outcomes:**

The main purpose of the subject is to understand what drugs do to the living organisms and how their effects can be applied to therapeutics. The subject covers the information about the drugs like, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with

the adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes ofdrugs.

Upon completion of this course the student should be able to

**CO1:** Understand the pharmacological actions of different categories of drugs

**CO2:** Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.

**CO3:** Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.

**CO4:** Observe the effect of drugs on animals by simulated experiments

**Subject Code: BP408P**

**Title of the course: PHARMACOLOGY-I (Practical)**

**Course Outcomes:**

**CO1:** Understand the pharmacological actions of different categories of drugs

**CO2:** Observe the effect of drugs on animals by simulated experiments

**CO3:** Appreciate correlation of pharmacology with other bio medical science.

**Subject Code: BP 405T**

**Title of the course: PHARMACOGNOSY AND PHYTOCHEMISTRY-I (Theory)**

**Course Outcomes:**

The subject involves the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them and their medicinal properties.

Upon completion of this course the student should be able to:

**CO 1:** Know the techniques in the cultivation and production of crude drugs

**CO2:** Know the crude drugs, their uses and chemical nature

**CO3:** Know the evaluation techniques for the herbal drugs

**CO4:** To carry out the microscopic and morphological evaluation of crude drugs

**Subject Code: BP409P**

**Title of the course: PHARMACOGNOSY AND PHYTOCHEMISTRY-I (Practical)**

**Course Outcomes:**

**CO1:** Analysis of crude drugs by through chemical testing and extractive value.

**CO2:** Determination of microscopic and macroscopic characters of crude drugs.

**CO3:** Determine the purity, identity and swelling index of certain crude drugs

**B. Pharmacy 5th Sem**

**Subject Code: BP501T**

**Title of the course : MEDICINAL CHEMISTRY-II (Theory)**

**Course Outcomes:**

This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physiochemical properties and metabolism of drugs.The syllabus also emphasizes on chemical synthesis of important drugs under each class.

Upon completion of this course the student should be able to:

**CO 1:** Understand the chemistry of drugs with respect to their pharmacological activity. CO2: Understand the drug metabolic pathway, adverse effects and therapeutic value of drugs.

**CO3:** Know the structure activity relationship of different class of drugs

CO4: Study the chemical synthesis of selected drugs.

**Subject Code: BP 502T**

**Title of the course : INDUSTRIAL PHARMACY- I(Theory)**

**Course Outcomes:**

Course enables the student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product.

Upon completion of the course the student shall be able to

**CO1:** Know the various pharmaceutical dosage forms and their manufacturing techniques.

**CO2:** Know various considerations in development of pharmaceutical dosage forms

**CO3:** Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality

**CO4:** Explain formulation, evaluation and labeling of tablets & capsules.

**Subject Code: BP506P**

**Title of the course : INDUSTRIAL PHARMACY -I (Practical)**

**Course Outcomes:**

Course enables the student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product.

Upon completion of the course the student shall be able to

**CO1:** State the correct use of various equipments in Pharmaceutics laboratory relevant to tablets, capsules & coating and Cosmetic creams parental dosage forms.

**CO2:** To understand rational behind use of formulation ingredients.

**CO3:** Formulation and evaluation of different dosage forms like parenteral, tablet capsule Cosmetic and liquid.

**Subject Code: BP503T**

**Title of the course : PHARMACOLOGY- II(Theory)**

**Course Outcomes:**

Upon completion of this course the student should be able to:

**CO 1:** Understand the mechanism of drug action and its relevance in the treatment of different diseases

**CO2:** Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments

**CO3:** Demonstrate the various receptor actions using isolated tissue preparation

**CO4:** Appreciate correlation of pharmacology with related medical sciences

**Subject Code: BP507P**

**Title of the course : PHARMACOLOGY- II(Practical)**

**Course Outcomes:**

**CO1:** Explain correlation between the pharmacokinetics and pharmacodynamics.

**CO2:** Understand the dose of drug and the adverse effects due to overdosing.

**CO3:** Understand the effect of drugs under various parameters.

**Subject Code: BP504T**

**Title of the course : PHARMACOGNOSY AND PHYTOCHEMISTRY-II**

**(Theory)**

**Course Outcomes:**

Upon completion of this course the student should be able to:

**CO 1:** Know the modern extraction techniques, characterization and identification of the herbal drugs and phyto constituents

**CO2:** To understand the preparation and development of herbal formulation. CO3: To understand the herbal drug interactions

**CO4:** To carryout isolation and identification of phyto constituents

**Subject Code: BP 508P**

**Title of the course : PHARMACOGNOSY ANDPHYTOCHEMISTRY-II**

**(Practical)**

**Course Outcomes:**

**CO1:** Macroscopic analysis of crude drugs through extraction, chemical test and detection of its nature.

**CO2:** Determination active ingredient of crude drugs through chromatography techniques.

**CO3:** Determine the volatile oil and detection of its phytoconstituents by TLC.

**Subject Code: BP 505T**

**Title of the course : PHARMACEUTICAL JURISPRUDENCE(Theory)**

**Course Outcomes**:

This course is designed to impart basic knowledge on important legislations related to the profession of Pharmacy in India.

Upon completion of the course, the student shall be able to understand:

**CO1:** The Pharmaceutical legislations and their implications in the development and Marketing of pharmaceuticals.

**CO2:** Various Indian pharmaceutical Acts and Laws

**CO3:** The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals

**CO4:** The code of ethics during the pharmaceutical practice.

**B. Pharmacy 6th Sem**

**Subject Code: BP 601T**

**Title of the course : MEDICINAL CHEMISTRY – III(Theory)**

**Course Outcomes:**

Upon completion of the course student shall be able to

**CO1.** Understand the importance of drug design and different techniques of drug design.

**CO2.** Understand the chemistry of drugs with respect to their biological activity.

**CO3**. Know the metabolism, adverse effects and therapeutic value of drugs.

**CO4**. Know the importance of SAR of drugs.

**Subject Code: BP607P**

**Title of the course: MEDICINAL CHEMISTRY- III (Practical) Course Outcomes:**

Upon completion of the course the student shall be able to:-

**CO1.** Understand the importance of drug design and different techniques of drug design.

**CO2.** Understand the chemistry of drugs with respect to their biological activity.

**CO3.** Know the metabolism, adverse effects and therapeutic value of drugs.

**CO4.** Know the synthesis of reactions and chemical structures with the help of software.

**Subject Code:** **BP602T**

**Title of the course:** **PHARMACOLOGY-III(Theory)**

**Course Outcomes:**

**CO1:** Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases

**CO2:** Comprehend the principles of toxicology and treatment of various poisonings

CO3: Appreciate correlation of pharmacology with related medical sciences.

**Subject Code:** **BP 608P**

**Title of the course:** **PHARMACOLOGY-III(Practical)**

**Course Outcomes**

**CO1:** Understand the pharmacological actions of different categories of drugs

**CO2:** Observe the effect of drugs on animals by simulated experiments

**CO3:** Appreciate correlation of pharmacology with other bio medical science.

**Subject Code** **:** **BP 603T**

**Title of the course** **:** **HERBAL DRUG TECHNOLOGY (Theory)**

**Course Outcomes:**

**CO1:** Understand raw material as source of herbal drugs from cultivation to herbal drug product

**CO2:** Know the WHO and ICH guidelines for evaluation of herbal drugs

**CO3:** Know the herbal Cosmetics, natural sweeteners, Nutraceuticals

**CO4:** Appreciate patenting of herbal drugs, GMP.

**Subject Code:** **BP 609P**

**Title of the course:** **HERBAL DRUG TECHNOLOGY(Practical)**

**Course Outcomes:**

**CO1:** Introduction and study of phytochemical screening of crude drugs

**CO2:** Introduction to different methods for preparation of different Herbal formulations

**CO3:** Describe different methods for selection, identification and authentication of herbal materials

**Subject Code:** **BP604T**

**Title of the course:** **BIOPHARMACEUTICS AND PHARMACOKINETICS**

**(Theory)**

**Course Outcomes:**

**CO1:** Understand the basic concepts in Biopharmaceutics and pharmacokinetics and their significance.

**CO2:** Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination

**CO3:** Learning various compartmental models.

**CO4:** Understand the concepts of bioavailability and bioequivalence of drug products and their significance.

**Subject Code:** **BP 605T**

**Title of the course:** **PHARMACEUTICAL BIOTECHNOLOGY(Theory)**

**Course Outcomes:**

Biotechnology has a long promise to revolutionize the biological sciences and technology. Scientific application of biotechnology in the field of genetic engineering, medicine and fermentation technology makes the subject interesting.

Biotechnology is leading to new biological revolutions in diagnosis, prevention and cure of diseases, new and cheaper pharmaceutical drugs.

Biotechnology has already produced transgenic crops and animals and the future promises lot more. It is basically a research-based subject.

Upon the completion of the course student shall be able to:

**CO1:** Understanding the importance of immobilized enzymes in Pharmaceutical Industries

**CO2:** Genetic engineering applications in relation to production of pharmaceuticals

**CO3:** Importance of Monoclonal antibodies in Industries

**CO4:** Appreciate the use of microorganisms in fermentation technology

**Subject Code: BP 606T**

**Title of the course: QUALITY ASSURANCE (Theory)**

**Course Outcomes**:

This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It deals with the important aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs.

Upon completion of the course student shall be able to:

**CO1:** Understand the cGMP aspects in a pharmaceutical industry

**CO2:** Appreciate the importance of documentation

**CO3:** Understand the scope of quality certifications applicable to pharmaceutical industries

**CO4:** Understand the responsibilities of QA & QC departments

**B. Pharmacy 7th Sem**

**Subject Code BP701T**

**Title of the course: INSTRUMENTAL METHODS OF ANALYSIS(Theory)**

**Course Outcomes:**

This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart a fundamental knowledge on the principles and instrumentation of spectroscopic and chromatographic technique. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing

Upon completion of the course the student shall be able to:-

**CO1:** Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis

**CO2:** Understand the chromatographic separation and analysis of drugs.

**CO3:** Perform quantitative & qualitative analysis of drugs using various analytical instruments.

**Subject Code:** **BP705P**

**Title of the course:** **INSTRUMENTAL METHODS OF ANALYSIS(Practical)**

**Course Outcomes:**

Upon completion of the course the student shall be able to:-

**CO1:** Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis

**CO2:** Understand the chromatographic separation and analysis of drugs.

**CO3:** Perform quantitative & qualitative analysis of drugs using various analytical instruments.

**Subject Code** **:** **BP702T**

**Title of the course** **:** **INDUSTRIAL PHARMACY-II(Theory)**

**Course Outcomes:**

This course is designed to impart fundamental knowledge on pharmaceutical product development and translation from laboratory to market

Upon completion of the course, the student shall be able to:

**CO1:** Know the process of pilot plant and scale up of pharmaceutical dosage forms.

**CO2:** Understand the process of technology transfer from lab scale to commercial batch.

**CO3:** Know different Laws and Acts that regulate pharmaceutical industry.

**CO4:** Understand the approval process and regulatory requirements for drug products.

**Subject Code:** **BP703T**

**Title of the course:** **PHARMACY PRACTICE(Theory)**

**Course Outcomes:**

In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug

information and therapeutic drug monitoring for improved patient care. In community pharmacy, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counseling for improved patient care in the community set up.

Upon the completion of the course student shall be able to:

**CO1:-** Know various drug distribution methods in a hospital

**CO2:-** Monitor drug therapy of patient through medication chart review and clinical Review

**CO3:-** Obtain medication history interview and counsel the patients

**CO4:-** Know pharmaceutical care services

**Subject Code:** **BP704T**

**Title of the course:** **NOVEL DRUG DELIVERY SYSTEMS (Theory)**

**Course Outcomes:**

This subject is designed to impart basic knowledge on the area of novel drug delivery systems.

Upon completion of the course student shall be able

**CO1:** To understand various approaches for development of novel drug delivery systems.

**CO2:** To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation

**CO3:** Describe the formulation, merits, demerits, application and evaluation of Novel Drug Delivery Systems.

**CO4:** Explain therapeutic Aerosols along with typical formulations from, metered dose, intranasal and topical applications.

**B. Pharmacy 8th Sem**

**Subject Code:** **BP801T**

**Title of the course:** **BIOSTATISTICS AND RESEARCH METHODOLOGY (Theory)**

**Course Outcomes:**

This subject deals with descriptive statistics, Graphics, Correlation, Regression, logistic regression Probability theory, Sampling technique, Parametric tests, Non Parametric tests,

ANOVA, Introduction to Design of Experiments, Phases of Clinical trials and Observational and Experimental studies, SPSS, R and MINITAB statistical software's, analyzing the statistical data using excel.

Upon completion of the course student shall be able to:

**CO1:** Understand the applications of Biostatics in Pharmacy

**CO2:** Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment)

**CO3:** Know the various statistical techniques to solve statistical problems

**CO4:** Appreciate statistical techniques in solving the problems.

**Subject Code: BP 802T**

**Title of the course: SOCIAL AND PREVENTIVE PHARMACY(Theory)**

**Course Outcomes:**

Upon the completion of the course student shall be able to:

**CO1:-** Acquire high consciousness/realization of current issues related to health and Pharmaceutical problems within the country and worldwide.

**CO2:-** Have a critical way of thinking based on current healthcare development.

**CO3:-** Evaluate alternative ways of solving problems related to health and pharmaceutical issues

**CO4:-.** Role of education to improve community health

**Subject Code: BP803ET**

**Title of the course: PHARMA MARKETING MANAGEMENT (Theory)**

**Course Outcomes:**

The pharmaceutical industry not only needs highly qualified researchers, chemists and, technical people, but also requires skilled managers who can take the industry forward by managing and taking the complex decisions which are imperative for the growth of the industry.

Upon completion of the subject student shall be able to:-

**CO1:** Provide an understanding of marketing concepts and techniques.

**CO2:** Provide their applications in the pharmaceutical industry.

**CO3:** Provide Knowledge and Know-how of marketing management groom the people for taking a challenging role in Sales and Product management

**Subject Code: BP804ET**

**Title of the course: PHARMACEUTICAL REGULATORY SCIENCE(Theory)**

**Course Outcomes:**

This course is designed to impart the fundamental knowledge on the regulatory requirements for approval of new drugs, and drug products in regulated markets of India & other countries like US, EU, Japan, Australia, UK etc.

Upon completion of the subject student shall be able to;

**CO1:** Know about the process of drug discovery and development

**CO2:** Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals

**CO3:** Know the regulatory approval process and their registration in Indian and international markets

**Subject Code: BP805ET**

**Title of the course: PHARMACOVIGILANCE (Theory)**

**Course Outcomes:**

**CO1:** Why drug safety monitoring is important?

**CO2:** History and development of pharmacovigilance

**CO3:** National and international scenario of pharmacovigilance

**CO4:** Dictionaries, coding and terminologies used in pharmacovigilance

**Subject Code: BP 806ET**

**Title of the course: QUALITY CONTROL AND STANDARDISATIONOF**

**HERBALS (Theory)**

**Course Outcomes:**

In this subject the student learns about the various methods and guidelines for evaluation and standardization of herbs and herbal drugs. The subject also provides an opportunity for the student to learn cGMP, GAP and GLP in traditional system of medicines.

Upon completion of the course the student shall be able to:-

**CO1:** To know WHO guidelines for quality control of herbal drugs

**CO2:** To know Quality assurance in herbal drug industry

**CO3:** To know the regulatory approval process and their registration in Indian and international markets

**CO4:** To appreciate EU and ICH guidelines for quality control of herbal drug

**Subject Code : BP807ET**

**Title of the course : COMPUTER AIDED DRUG DESIGN(Theory)**

**Course Outcomes:**

This subject is designed to provide detailed knowledge of rational drug design process and various techniques used in rational drug design process.

Upon completion of the course student shall be able to:

**CO1:** The role of drug design in drug discovery process

**CO2:** The concept of QSAR and docking

**CO3:** Various strategies to develop new drug like molecules

**CO4:** The design of new drug molecules using molecular modeling software.

**Subject Code: BP808ET**

**Title of the course: CELL AND MOLECULAR BIOLOGY (Theory)**

**Course Outcomes:**

Cell biology is a branch of biology that studies cells – their physiological properties, their structure, the organelles they contain, interactions with their environment, their life cycle, division, death and cell function.This is done both on a microscopic and molecular level. Cell biology research encompasses both the great diversity of single-celled organisms like bacteria and protozoa, as well as the many specialized cells in multi-cellular organisms such as humans, plants, and sponges.

**CO1:** Summarize cellular functioning and composition.

**CO2:** Describe the chemical foundations of cell biology.

**CO3:** Summarize the DNA properties of cell biology.

**CO4:** Describe protein structure and function.

**Subject Code: BP809ET**

**Title of the course: COSMETIC SCIENCE (Theory)**

**Course Outcomes:**

This subject upon completion of the course student shall be able to:

**CO1:** Understand the concepts of Cosmetics, anatomy of skin v/s hair, general excipients used in Cosmetics.

**CO2:** Explain formulation of Cosmetics for skin, manufacturing, equipments &evaluation of creams like cold cream, vanishing cream etc. & powderCosmetics.

**CO3:** Explain the concept of Cosmeceuticals, history, difference between Cosmetics & Cosmeceuticals & Cosmeceutical agents

**CO4:** Learn formulation, manufacture & evaluation of baby Cosmetics like baby oils, powdersetc.

**Subject Code: BP810ET**

**Title of the course: EXPERIMENTAL PHARMACOLOGY(Theory)**

**Course Outcomes:**

This subject is designed to impart the basic knowledge of preclinical studies in experimental animals including design, conduct and interpretations of results.

**CO1:** Appreciate the applications of various commonly used laboratory animals.

**CO2:** Appreciate and demonstrate the various screening methods used in preclinical research

**CO3:** Appreciate and demonstrate the importance of biostatistics and research methodology

**CO4:** Design and execute a research hypothesis independently

**SubjectCode: BP811ET**

**Title of the course: ADVANCED INSTRUMENTATION TECHNIQUES (Theory)**

**Course Outcomes:**

This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart advanced knowledge on the principles and instrumentation of spectroscopic and chromatographic hyphenated techniques. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drugtesting

Upon completion of the course student shall be able to:

**CO1:** Understand the advanced instruments used and its applications in drug analysis

**CO2:** Understand the chromatographic separation and analysis of drugs

**CO3:** Understand the calibration of various analyticalinstruments

**CO4:** Know analysis using various of drugs analyticalinstruments.

**Subject Code: BP812ET**

**Title of the course: DIETARY SUPPLEMENTS ANDNUTRACEUTICALS (Theory)**

**Course Outcomes:**

This subject covers foundational topic that are important for understanding the need and requirements of dietary supplements among different groups in the population.

Students should be able to:

**CO1:** Understand the need of supplements by the different group of people to maintain healthy life.

**CO2:** Understand the outcome of deficiencies in dietary supplements Cosmetics.

**CO3:** Appreciate the components in dietary supplements and the application

**CO4:** Appreciate the regulatory and commercial aspects of dietary supplements including health claims.

**Subject Code: BP813ET**

**Title of the course: PHARMACEUTICAL PRODUCTDEVELOPMENT**

**(Theory)**

**Course Outcomes:**

Course enables the student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product.

Upon completion of the course the student shall be able to

**CO1:** Understand the various processes involved in the pharmaceutical product development.

**CO2:** Know the application of various excipients used for the formulation of dosages forms.

**CO3:** Study the Preformulation study, Formulation and Evaluation of different dosage forms like parenteral, tablet capsule Cosmetic and liquid.

**CO4:** Know the various evaluation parameters for the packaging material and understand the concept of Quality by design.