SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTU, Hyderabad)
Sagar Road, Sheriguda, Ibrahimpatnam, R.R.Dist.-501510
Ph.:08414-202206, 320919, 9393808082
www.sreedattha.org, E-mail: principalsdip@sreedattha.ac.in

College Code: SDIP

To,

The Coordinator,

NAAC, Bengaluru.

Subject: Proof of The Institution has stated the learning outcomes (generic and programme specific) and graduate attributes as per the provisions of the Regulatory bodies and the University; which are communicated to the students and teachers through the website and other documents.

Reference: 2.6.1 The Institution has stated the learning outcomes (generic and programmespecific) and graduate attributes as per the provisions of the Regulatory bodies and the University; which are communicated to the students and teachers through the website and other documents.

Dear Sir/Madam,

2.6.1

- Course Outcomes for all courses

SEAL U2 SREE DATTHA INSTITUTE OF PHARMACY SHERIGUDA

Signature 2019

Dr. S A SREENIVAS
M. Pharm, Ph. D
PRINCIPAL
Sree Dattha Institute of Pharmacy
Sheriguda. V, Ibrahimpatnam .M, R.R .Dist -501 510.

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COURSE OUTCOME

Sponsored by: Vyjayanthi Educational Society

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Vision:

To be a globally recognized pharmacy education and research centre integrating the science and technology to advance pharmaceutical drug discovery, formulation and provide health care service to professional, scientific communities and public.

Mission:

- Nurture students into knowledgeable, skillful and ethical professionals.
- Nurture the faculty to expose them to world-class infrastructure
- Sustain high performance by excellence in teaching, research and innovations
- Extensive partnerships and collaborations with industries/foreign universities for technology up gradation

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B. Pharmacy

B. Pharmacy I year I Semester

PS101 Human anatomy and Physiology-I

Upon completion of the course the student shall be able to

CO1: Define basic terminologies in anatomy and physiology, describe its relevance and significance to pharmaceutical sciences and illustrate progression of structural levels.

CO2: Explain the anatomy, physiology and disorders of skeletal & smooth muscle, circulatory, cardiovascular, lymphatic and digestive system.

CO3: Students would learn about the various experimental techniques related to physiology.

CO4: Demonstrate and perform blood sampling, bleeding time, clotting time, blood typing, haemoglobin, leucocyte and erythrocyte count and blood pressure determination.

CO5: Comprehend WHO Definition of health and health promotion.

PS102 Pharmaceutical analysis I

Upon completion of the course the student shall be able

CO1: Learn the fundamental methodology to prepare different strength of solutions.

CO2: Predict the sources of mistakes and errors.

CO3: Develop the fundamentals of volumetric analytical skills.

Peculates the basic knowledge in the principles of electrochemical analytical techniques

PS103 Pharmaceutics I

Upon completion of the course the student shall be able to

CO1: Understand pharmacy profession, pharmaceutical ethics & status of pharmaceutical industry in India.

CO2: Define & classifying various dosage form & enlist excipients use in formulating dosage form.

CO3: Understand the importance of preformulation parameters & justify their significance in formulation development.

CO4: Define & classifying various dosage form & enlist excipients use in formulating dosage form.

CO5: Understand the importance of preformulation parameters & justify their significance in formulation development.

CO6: Classify types of solution, evolutes their properties & understand the formulations aspect.

CO7: Formulate different aromatic waters.

CO8: Formulate and evaluate different monophonic liquids, glycerites and syrups.

CO9: Formulate and evaluate different powder dosage form.

PS104 Pharmaceutical inorganic chemistry

Upon completion of the course the student shall be able to

CO1: Highlight applicability and explain the relevance and significance of inorganic chemistry to pharmaceutical sciences.

CO2: Differentiate and describe various pharmacopoeias currently in use and discuss the contents of official monographs in pharmacopoeias.

CO3: Explain meaning of impure and pure chemical compounds and describe official methods of control like limit tests and qualitative tests.

CO4: Classify &illustrate importance of different inorganic pharmaceutical agents and their preparation, properties, storage, uses, marketed formulations used.

CO5: Prepare inorganic pharmaceutical compounds, perform qualitative analysis for detection of acidic and basic radicals from given inorganic binary mixture and apply them for unknown sample.

CO6: Explain method of manufacturing, identification tests of important inorganic substances used for pharmaceutical purpose. Performing limit tests and tests for purities for various inorganic agents.

HS105 Communication skills

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: Explain Technical and Business Communication.

CO4: Effectively manage the team as a team player.

CO5: Utilize knowledge of various soft skills like Empathy, Negotiation skills etc.

CO6: Develop interview skills.

CO7: Develop Leadership qualities and essentials.

BS105	Remedial biology

Upon completion of the course the student shall be able to

CO1: Cell biology (Basic Nature of Plant cell and Animal cell).

CO2: Classification System of both Plants & Animals.

CO3: Various tissue system and organ system in plant and animals.

CO4: Theory of evolution.

CO5: Anatomy and Physiology of plants and animals.

BS107	Remedial mathematics

Upon completion of the course the student shall be able to

CO1: Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.

CO2: Create, use and analyze mathematical representations and mathematical relationships.

CO3: Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy.

CO4: Perform abstract mathematical reasoning.

B. Pharmacy I year II Semester

PS201	Human anatomy and physiology II

Upon completion of the course the student shall be able to

CO1: Explain Basic fundamentals structural features of neurons, mechanism of neurotransmitters along with processes of neuroconduction and neurotransmission.

CO2: Clarify concepts and knowledge of anatomy, physiology & disorders of nervous system.

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

CO4: Explain concepts and knowledge of anatomy, physiology & disorders of respiratory system.

CO5: Explain and discuss knowledge of and urinary system and endocrine system involve in regulation of Body functions & how all parts of the human body contribute to the maintenance of homeostasis.

CO6: Describe organs involve in reproductive system, genetics, and aging process each contributes to the reproduction, growth and development of a human body.

CO7: Determine platelet count, reticulocytes count and osmotic fragility of blood sample.

CO8: To identify the different bones of human skeleton and joints

CO9: Acquire the knowledge regarding health education in human life such as various devices of family planning and first aid

PS202 Pharmaceutical organic chemistry I

Upon completion of the course the student shall be able to

CO1: Explain basic concepts and principles of organic chemistry and will be able to explain hybridization of atomic orbital of C, N, O.

CO2: Assign IUPAC name and write structure of organic molecules of given IUPAC name containing diverse functional group.

CO3: Recognize stereoisomers, assign configuration to stereoisomers and correlate the effect of intermolecular and intramolecular forces of attraction on structure property relationship.

CO4: Differentiate classes of reactions, reagents, intermediate and types of reaction mechanism and recognize various factors that affect strengths of acids and bases.

CO5: Memorize mechanism, stereochemistry of elimination reactions and describe mechanism of addition reactions in alkenes, alkynes and summarize general methods of preparation of alkanes, alkenes and alkyne.

CO6: Account for reactivity/stability of compounds,

CO7: Identify/confirm the unknown organic compound.

CO8: Knowledge about the naming reactions of carbonyl compounds.

CO9: Demonstrate conduct of experiment effectively and safely in the organic chemistry laboratory.

CO10: To perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration, etc.

CO11: Apply laboratory skills to identify organic compound by qualitative analysis and synthesis of their derivatives containing diverse functional group.

CP12: Synthesize different organic compounds and able to explain reaction mechanism behind the synthesis.

BS203	**Biochemistry**

Upon completion of the course the student shall be able to

CO1: To understand the importance of metabolism of substrates.

CO2: Will acquire chemistry and biological importance of biological macromolecules

CO3: Extend the knowledge of biochemical morphology to explain transport across bio membrane.

CO4: Illustrate and write the classification, structure, chemistry and biochemical role of different biomolecules like proteins, carbohydrates, lipids and vitamins.

CO5: Outline various metabolic pathways, their integration and significance.

CO6: Categorize nucleic acids; describe their chemistry, biochemical role and processes like replication, transcription, translation.

CO7: Demonstrate laboratory skills to identify biomolecules by qualitative and quantitative tests.

CO8: To acquire knowledge in qualitative and quantitative estimation of the biological macromolecules.

CO9: To know the interpretation of data emanating from a Clinical Test Lab.

CO10: Isolate and identify biomolecules from various natural products.

CO11: Apply the gel electrophoresis as isolation technique.

BS204 Pathophysiology

Upon completion of the course the student shall be able to

CO1: Describe the etiology and pathogenesis of the selected disease states.

CO2: Knowledge of signs and symptoms of the diseases.

CO3: Identify the complications of the diseases.

CO4: Know most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements.

CS205 Computer Application in Pharmacy

Upon completion of the course the student shall be able to

CO1: Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement

CO2: Design and develop solutions to analyze pharmaceutical problems using computers.

CO3: Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities

CO4: Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy.

B. Pharmacy II year I Semester

PS301 Pharmaceutical Organic Chemistry II

Upon completion of the course the student shall be able to

CO1: Basic knowledge regarding general methods of preparation of organic compounds.

CO2: Understand the reactions of some organic compounds.

CO3: To understand Reactivity of organic compounds.

CO4: Special emphasis on mechanisms and orientation of chemical reactions.

CO5: To acquire knowledge in heterocyclic compounds.

CO6: To acquire knowledge about the electrophilic and nucleophilic reactions.

CO7: Demonstrate laboratory skills to separate and identify the organic compounds from the given unknown binary organic compounds having different functional reactive groups (solid-solid binary mixture).

CO8: Synthesize organic compounds based on molecular rearrangements.

PS302 Physical Pharmaceutics I

Upon completion of the course the student shall be able to

CO1: Utilize the principles of gases state of matter and phase rule for formulation of stable aerosols and emulsions.

CO2: Understand crystal habit, methods of crystal analysis and the importance of polymorphism in solubility and design of dosage forms.

CO3: Explain solubility, calculate molecular weight, understand distribution phenomenon and utilize them in understanding absorption of drugs.

CO4: Analyze the chemical stability tests of various drug products.

CO5: Understand the laws of thermodynamics & concept of enthalpy.

CO6: Understand of physicochemical properties of drugs including solubility, distribution, adsorption, and stability.

CO7: Calculate Critical solution temperature, evaluate the effect of addition of electrolyte on Critical solution temperature of phenol –water system and construct ternary phase diagram for three component systems.

CO8: Calculate solubility of substance at different temperature, in different solvents, understand the effects of co-solvents on solubility and the importance of partition co-efficient required for preformulation studies.

CO9: Calculate the heat of solution for some components.

CO10: Calculate and evaluate unknown concentration of electrolytes by conduct metric titrations.

BS303 Pharmaceutical Microbiology

Upon completion of the course the student shall be able to

CO1: Acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology.

CO2: Acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.

CO3: Communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing.

CO4: Demonstrate isolation of and identification of microbes.

CO5: Acquire knowledge about validating the microbiological equipment and reporting the observations.

CO6: Describe the applications of antibiotic assay, sterility testing of WFI & MIC (minimum inhibitory concentration)) in the field of pharmacy and emphasize their principles.

PC304 Pharmaceutical Engineering

Upon completion of the course the student shall be able to

CO1: Understand basic principles of industrial process involved in processing of drug and excipients.

CO2: Understand basic principles of process engineering and to develop new pharmaceutical process and modify existing one.

CO3: Apply basic principles of unit operations like crystallization, Drying, Distillation, Extraction, mass transfer, heat transfer etc. where it involves.

CO4: Apply advance modules as per the changing priorities and requirements of the modern pharmaceutical industries.

CO5: Understand the fundamental principles and facts in pharmaceutical engineering about Unit operations.

CO6: Understand the material handling techniques.

CO7: Perform various processes involved in pharmaceutical manufacturing process.

CO8: Appreciate and comprehend significance of plant lay out design for optimum

CO9: Appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.

PS401 Pharmaceutical Organic Chemistry III

Upon completion of the course the student shall be able to

CO1: Acquire the knowledge and understanding of the basic experimental principles of heterocyclic chemistry.

CO2: Draw the structures and synthesize simple pharmaceutically active organic compounds having five and six membered heterocyclic compounds.

CO3: Describe detailed mechanisms for common naming reactions.

CO4: Run experimental techniques, procedures and safe laboratory practices.

CO5: Synthesize organic compounds based on molecular rearrangements.

CO6: Demonstrate laboratory skills to separate and identify the organic compounds from the given unknown binary organic compounds having different functional reactive groups (solid-solid binary mixture.

PC402 Medicinal Chemistry I

Upon completion of the course the student shall be able to

CO1: Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.

CO2: Know the structural activity relationship of different class of drugs.

CO3: Well acquainted with the synthesis of some important class of drugs.

CO4: Know about the mechanism pathways of different class of medicinal compounds.

CO5: Understand the chemistry of drugs with respect to their pharmacological activity.

CO6: Apply purification techniques of solvents by Fractional distillation and vacuum distillation.

CO7: Synthesize acid and basic salts of drugs and evaluate their physicochemical properties.

CO8: Determine the partition co-efficient and dissociation constant of various compounds.

CO9: Synthesize medicinal drugs and theirs intermediates.

PC403 Physical pharmaceutics II

Upon completion of the course, students will be able to:

CO1: State the physicochemical properties of drug molecules, pH, and solubility.

CO2: Explain the role of surfactants, interfacial phenomenon and thermodynamics.

CO3: Describe the flow behavior of fluids and concept of complexation.

CO4: Analyze the chemical stability tests of various drug products.

CO5: Evaluate the kinetics of drug system and predict the shelf life of the product, storage and its stability.

CO6: Determine particle size, particle size distribution & characterization of powders.

CO7: Calculate surface tension of liquids, cloud point, Kraft point, critical micelle concentration and HLB of surfactant.

CO8: Determine order of reaction, energy of activation of reactions and calculate the relative strength of two acids.

CO9: Calculate viscosity of liquids, determine the composition of binary mixture and understand the working of Brookfield viscometer.

CO10: Determine the particle size and size distribution by microscopy & sieve analysis & calculate the specific surface area of material of adsorbent.

CO11: Determine the effect of salts on stability of colloids (hydrophobic colloids).

PC404 Pharmacology - I

Upon completion of the course, students will be able to:

CO1: Extend the knowledge of basics of pharmacology like history, scope, general principals, nature and sources of drugs and route of drug administration.

CO2: Outline the process of drug discovery and development.

CO3: Relate the pharmacokinetic and pharmacodynamic processes.

CO4: Illustrate the concept of receptor, individualization of drug therapy, adverse drug reaction, drug interaction and drug toxicity.

CO5: Illustrate the rational drug treatment of geriatric, pediatric, pregnancy and lactation.

CO6: Understand the pharmacological actions of different categories of drugs.

CO7: They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various diseases.

CO8: Observed the effect of drugs on animals by simulated experiments.

CO9: Got an idea about correlation of pharmacology with other bio medical sciences.

CO10: Understood the signal transduction mechanism of various receptors.

PC405 Pharmacognosy & Phytochemistry I

Upon completion of the course, students will be able to:

CO1: Describe meaning and significance of Pharmacognostic parameters of crude drugs.

CO2: Outline reason of evolutionary significance of secondary metabolites production in plants and other organism and deduce their significance as medicinal molecules.

CO3: Discriminate primary and secondary metabolites from their source and explain their industrial applications.

CO4: Explain definition, source, classification, chemical structure, uses, and summaries biosynthetic pathway of primary and secondary metabolites.

CO5: Illustrate methods of extraction and explain rationale behind qualitative and quantitative analysis of primary and secondary metabolites.

CO6: Develop skills for sectioning of plant material, staining, mounting and focusing; choose staining reagents required for specific part of plant.

CO7: Draw morphological and microscopical diagrams, label component and judge purity of crude drugs.

CO8: Assemble extraction apparatus, isolate single component and evaluate them by various chemical and physical parameters.

CO9: Operate various equipments as per SOPs and principle of experiments.

MC 400 Gender Sensitization Lab

Upon completion of the course, students will be able to:

CO1: Developed a better understanding of important issues related to gender in contemporary India.

CO2: Sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender.

CO3: Grasp of how gender discrimination works in our society and how to counter it.

CO4: Acquire insight into the gendered division of labour and its relation to politics and economics.

CO5: Men and women students and professionals will be better equipped to work and live together as equals.

CO6: Develop a sense of appreciation of women in all walks of life.

B. Pharmacy III year I Semester

PS501 Medicinal chemistry II

Upon completion of the course, students will be able to:

CO1: Write the chemical synthesis of some drugs.

CO2: Know the structural activity relationship of different class of drugs.

CO3: Acquire knowledge about the mechanism pathways of different class of medicinal compounds.

CO4: Acquire knowledge about the chemotherapy for cancer.

CO5: Understand the chemistry of drugs with respect to their pharmacological activity.

CO6: Apply the chemistry involved and synthesize some medicinally important organic compounds.

CO7: Perform synthesis of medicinal drugs and theirs intermediates by microwave assisted synthesizer.

PS502 Industrial Pharmacy - I

Upon completion of the course, students will be able to:

CO1: Understand the concepts of dosage form design & formulation strategies.

CO2: Understand the various drug delivery system and its mechanisms.

CO3: Explain tablets as a dosage form, physic-chemical principles guiding tablet formulation, various tablet additives, manufacture & evaluation, equipment, defects in tableting & remedies.

CO4: Learn the concept, types, pharmacopoeial specifications, techniques & equipments used in tablet coating.

CO5: Describe capsules, types, additives, size selection, manufacturing & evaluation, equipment & defects

CO6: Developing a preparation of the drug which is both stable and acceptable to the patient.

CO7: Developing a preparation of the drug which is both stable and acceptable to the patient.

CO8: State the correct use of various equipments in pharmaceutics laboratory relevant to tablets, capsules and tablet coating.

CO9: Learn formulation, evaluation and labeling of tablets& capsules.

CO10: Perform pharmaceutical calculations to determine evaluation of granules.

CO11: Describe use of ingredients in formulation and category of formulation.

CO12: Select the suitable packaging material for the preparation.

PS503 Pharmacology II

Upon completion of the course, students will be able to:

CO1: Students would have understood the mechanism of drug action and its relevance in the treatment of different diseases.

CO2: They would be trained with isolation of different organs/tissues from the laboratory animals by simulated experiments

CO3: They would have observed the various receptor actions using isolated tissue preparation

CO4: Students would appreciate the correlation of pharmacology with related medical sciences

CO5: They would have understood the cell communication mechanism

CO6: They would appreciate the newer targets of several disease conditions for treatment

CO7: Explain OECD guidelines (425) for Acute oral toxicity.

CO8: Explain principles of bioassay, its types including advantages and disadvantages.

CO9: Determine of unknown concentration of Acetylcholine/ Histamine using suitable isolated tissue preparations by Matching, Bracketing and interpolation bioassay method.

CO10: Demonstrate analgesic activity of drugs using Eddy's hot plate analgesiometer in mice.

CO11: Demonstrate locomotor activity of drug using actophotometer in mice.

CO12: Demonstrate muscle relaxant property of drug using rotarod in mice.

PS504 Pharmacognosy and Phytochemistry -II

Upon completion of the course, students will be able to:

CO1: Differentiate underlying reason of evolutionary significance of alkaloids formation in plants and other organism and deduce their significance as medicinal molecules.

CO2: Explain definition, classification, source, chemical structure, uses, and summaries biosynthetic pathway of alkaloids, terpenoids and resins.

CO3: Illustrate methods of extraction and explain rationale behind qualitative and quantitative analysis of alkaloids, terpenoids and resins.

CO4: Describe historical significance, contribution of alkaloids in modern drug discovery and currently marketed semisynthetic analogue.

CO5: Develop skills for sectioning of plant material, staining, mounting and focusing; choose staining reagents required for specific part of plant.

CO6: Draw morphological and microscopical diagrams, label component and judge purity of crude drugs.

CO7: Assemble extraction apparatus, isolate single component and evaluate them by various chemical and physical parameters.

CO8: Able to operate various equipments as per SOPs and principle of experiments.

CO9: Listen carefully, raise logical query, draw information, understand rationale during field visits and write brief report.

PS507 Cell and molecular biology

Upon completion of the subject student shall be able to:

CO1: Summarize cell and molecular biology history.

CO2: Summarize cellular functioning and composition.

CO3: Describe the chemical foundations of cell biology.

CO4: Summarize the DNA properties of cell biology.

CO5: Describe protein structure and function.

CO6: Describe cellular membrane structure and function.

CO7: Describe basic molecular genetic mechanisms.

MC 500	Environmental sciences

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: Develop an attitude of concern for the environment.

CO4: Motivate learner to participate in environment protection and environment improvement.

CO5: Acquire skills to help the concerned individuals in identifying and solving environmental problems.

CO6: Strive to attain harmony with Nature.

B. Pharmacy III Year II Semester

PS601	Medicinal chemistry III

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

CO5: Synthesize, recrystallize and understand reaction mechanisms involved in synthesis of medicinally important organic compounds and monitoring reactions over TLC.

CO6: Utilize the knowledge of Column chromatography for purification of synthesized compounds.

PS602	**Pharmacology III**

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

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 and appreciate correlation of pharmacology with related medical sciences.

PS603 Herbal Drug Technology

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

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.

PS604 Biopharmaceutics &Pharmacokinetics

Upon completion of the course student shall be able to:

CO1: Understand the basic concepts in biopharmaceutics and pharmacokinetics.

CO2: Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.

CO3: Critically evaluate biopharmaceutic studies involving drug product equivalency

CO4: Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.

CO5: Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them.

PS608 Screening Methods in Pharmacology

Upon completion of the course student shall be able to:

CO1: Acquire knowledge on preclinical evaluation of drugs and recent experimental techniques in the drug discovery and development.

CO2: Understand the maintenance of laboratory animals as per the guidelines.

CO3: Know how to handle animals.

CO4: Know about various techniques for screening of drugs for different pharmacological activities and guidelines for regulations involved in screening of new drug molecules on animals.

MC600	Human Values and Professional Ethics

Upon completion of the course student shall be able to:

CO1: Understand the importance of Values and Ethics in their personal lives and professional careers.

CO2: Know the rights and responsibilities as an employee, team member and a global citizen.

B. Pharmacy IV year I Semester

PS701	Pharmaceutical Analysis - II

Upon completion of the course student shall be able to:

CO1: Apply the principles, instrumentation involved in various analytical instrument, and their applications in Pharmaceutical industry and research.

CO2: Understand the aspects of separation for multi components.

CO3: Analysis drugs and excipients using various instrumentation techniques.

CO4: Make accurate analysis and report the results in defined formats.

CO5: Analyze test samples, Active Pharmaceutical Ingredients (APIs) and formulations using above instrument.

CO6: Process & interpret the data obtained through experimentation and report the results as per regulatory requirements.

PC702	Biopharmaceutics &Pharmacokinetics

Upon completion of the course student shall be able to:

CO1: Understand the basic concepts in Bioavailability, Bioequivalence, Biopharmaceutical parameters, Pharmacodynamic and Pharmacokinetics of the drug.

CO2: Explains the ADME of the drug besides non-linear pharmacokinetics.

CO3: Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.

CO4: Critically evaluate biopharmaceutic studies involving drug product equivalency

CO5: Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.

CO6: Detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them.

PC703 Pharmacology – III

Upon completion of the course student shall be able to:

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

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

CO3: Locate and isolate different organs/tissues from the laboratory animals used in pharmacological experiments

CO4: Study in detailed about various receptor actions using isolated tissue preparation

CO5: Understand the correlation of pharmacology with related medical sciences.

CO6: Find out the concentration of given drugs using three points and four-point bioassay method on suitable isolated tissue preparation.

CO7: Discuss the drug antagonism using suitable isolated tissue preparation.

CO8: Justify rationality and irrationality of fixed dose combinations using parameters such as pharmacodynamic, pharmacokinetic and side effects.

CO9: Give proper patient counseling based on the rational use of drugs.

CO10: Explain antioxidant activity of standard drugs.

PS704 Medicinal Chemistry - II

Upon completion of the course student shall be able to:

CO1: Describe the general aspects of the design & development of drugs.

CO2: Explain history and general aspects of the design & development of drugs.

CO3: Elaborate the chemical structure and biological activity of various categories of drugs.

CO4: Acquire knowledge about different chemotherapeutic agents.

CO5: Acquire knowledge about different classes of antibiotics.

CO6: Participate in the community pharmacy activities with the knowledge they gained through the study of the various topics of the syllabus.

CO7: Synthesize, recrystallize and understand reaction mechanisms involved in synthesis of medicinally important organic compounds and monitoring reactions over TLC.

HS705	Pharmacy Administration

Upon completion of the course student shall be able to:

CO1: Understand the strategy of Pharmaceutical business and management.

CO2: Demonstrate effective planning abilities, product and material management and organizational skills.

CO3: State the types, advantages and limitations of objectives.

CO4: Demonstrate the skills for pharmaceutical marketing, problem analysis, decision making and sales promotion.

CO5: Demonstrate leadership and communication skills.

CO6: Understand about disaster management, preparedness and mitigation.

B. Pharmacy IV Year II Semester

PS801	Novel Drug Delivery System

Upon completion of the course student shall be able to:

CO1: Select appropriate drug candidates and calculate the dose for formulation of Modified Drug Release System.

CO2: Describe, classify and select appropriate Polymers for formulating modified release systems.

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

CO4: Explain manufacturing techniques, product evaluation and safety considerations of Therapeutic aerosols.

CO5: Explicate the merits, demerits, applications, formulation techniques and evaluation of Microcapsules.

CO6: Describe the basic concept of Optimization, factors, variables and apply it in design of experiments.

CO7: Evaluate physicochemical characteristics of various polymers.

PC802 Clinical Pharmacy

Upon completion of the course student shall be able to:

CO1: Know the pathophysiology of selected disease states and the rationale for drug therapy, their therapeutic approach in management of diseases.

CO2: Understand the needs to identify the patient-specific parameters relevant in initiating drug therapy and its monitoring.

CO3: Formulate and evaluate microcapsules.

CO4: Formulate and evaluate sustained release, transdermal, gastro-retentive and beads.

CO5: Evaluate the quality of marketed preparations.

CO6: Optimize pharmaceutical preparations using factorial designs.

PC803 Pharmaceutical Biotechnology

Upon completion of the course student shall be able to:

CO1: Know screening of industrially interesting microbes.

CO2: Optimize fermentation process parameters.

CO3: Know about preparation, standardization, storage and labelling of biotechnologically derived products.

CO4: Know about bioinformatics and its applications in pharmacy.

CO5: Know about the regulatory control of biotechnological products.

PS804 Pharmacognosy – III

Upon completion of the course student shall be able to:

CO1: Know about the use of Medicinal plants. Plant as a source of drugs of pharmaceutical interest.

CO2: Know extraction procedures for natural compounds, their differences and their applications the main pathways of aromatic amino acids, alkaloids, phenylpropanoids.

CO3: Acquire knowledge about biogenesis and biological activity of natural products coming from mevalonate: terpenoids and steroids.

CO4: Acquire knowledge in biological activities of several compounds belonging to polyketides, terpenoids and steroids; and their traditional use and application in pharmaceutical and/or nutraceutical field.

CO5: Acquire knowledge about Indian Traditional systems of Medicine.

CO6: Use microscopic methods in the identification of natural drugs and herbal products, with emphasis on the use of light and scanning electron microscopes.

CO7: Acquire knowledge Principles and concepts in plant taxonomy, which include identification, classification, nomenclature, discussion of major recent/modern systems, family characterization and field work methods.

CO8: Explain Marine natural product chemistry and their Pharmaceutical importance

CO9: Acquire knowledge about Herbal cosmetics and Nutrients.

OE806	**Pharmacoepidemiology, Pharmacoeconomics & Pharmacovigilance**

Upon completion of the course student shall be able to:

CO1: Understand risk of pharmacoepidemiology history and need of pharmacoeconomics and assessment of pharmacovigilance.

SREE DATTHA INSTITUTE OF PHARMACY

(Approved by AICTE & PCI, New Delhi, Affiliated to JNTU, Hyderabad)
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Ph.:08414-202206, 320919, 9393808082
www.sreedattha.org, E-mail: principalsdip@sreedattha.ac.in
College Code: SDIP

PHARM.D.

Pharm.D. I Year

1.1 Human Anatomy and Physiology

Upon completion of the course student shall be able to:

CO1: Describe the structure (gross and histology) and functions of various organs of the human body.

CO2: Describe the various homeostatic mechanisms and their imbalances of various systems.

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

CO4: Perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes.

CO5: Appreciate coordinated working pattern of different organs of each system.

CO6: Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

1.2 Pharmaceutics

Upon completion of the course student shall be able to:

CO1: Knows the formulation aspects of different dosage forms;

CO2: Do different pharmaceutical calculation involved in formulation;

CO3: Formulate different types of dosage forms;

CO4: Appreciate the importance of good formulation for effectiveness.

1.3 Medicinal Biochemistry

Upon completion of the course student shall be able to:

CO1: Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases.

CO2: Know the metabolic process of biomolecules in health and illness (metabolic disorders).

CO3: Understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism.

CO4: Know the biochemical principles of organ function tests of kidney, liver and endocrine gland.

CO5: Do the qualitative analysis and determination of biomolecules in the body fluids.

1.4 Pharmaceutical Organic Chemistry

Upon completion of the course student shall be able to

CO1: Give systematic names to simple organic compounds and poly functional group.

CO2: Achieve an understanding of the behavior of organic compounds and to establish a foundation for studies into natural and synthetic products of pharmaceutical interest.

CO3: Acquire the knowledge and understanding of the basic experimental principles of pharmaceutical organic chemistry.

CO4: Draw the structures and synthesize simple pharmaceutically active organic compounds. Describe detailed mechanisms for common reactions.

CO5: Run experimental techniques, procedures and safe laboratory practices.

1.5 Pharmaceutical Inorganic Chemistry

Upon completion of the course student shall be able to

CO1: Acquainted with the principles of limit tests. Understand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceutical.

CO2: Acquire knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals

CO3: Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.

CO4: Know the analysis of the inorganic pharmaceuticals their applications.

1.6 Remedial Mathematics

Upon completion of the course student shall be able to

CO1: Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.

CO2: Create, use and analyze mathematical representations and mathematical relationships

CO3: Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy

CO4: Perform abstract mathematical reasoning.

1.7 Remedial Biology

Upon completion of the course student shall be able to understand/learn

CO1: Cell biology (Basic Nature of Plant cell and Animal cell).

CO2: Classification System of both Plants & Animals

CO3: Various tissue system and organ system in plant and animals.

CO4: Theory of evolution.

CP5: Anatomy and Physiology of plants and animals.

Pharm.D. II Year

2.1 Pathophysiology

Upon completion of the course student shall be able to

CO1: Define the basic pathogenesis of human disease.

CO2: Define and explore the most common etiologies and predisposing factors associated with human disease.

CO3: Understands the basis for some laboratory tests and other diagnostic procedures.

CO4: Make correlations between pathophysiology and clinical skills they are learning in their allied health science programs.

CO5: Understand how the various organ systems are interrelated, and use this understanding to promote a holistic approach towards the evaluation and treatment of patients.

2.2 Pharmaceutical Microbiology

Upon completion of the course student shall be able to

CO1: Know the anatomy, identification, growth factors and sterilization of microorganisms.

CO2: Know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect.

CO3: Do cultivation and identification of the microorganisms in the laboratory.

CO3: Do identification of diseases by performing the diagnostic tests;

CO5: Appreciate the behavior of motility and behavioral characteristic of microorganism.

2.3 Pharmacognosy&Phytopharmaceuticals

Upon completion of the course student shall be able to

CO1: Understand the basic principles of cultivation, collection and storage of crude drugs.

CO2: Know the source, active constituents and uses of crude drugs.

CO3: Appreciate the applications of primary and secondary metabolites of the plant.

2.4 Pharmacology - I

Upon completion of the course student shall be able to

CO1: Know about the different drugs used with an emphasis on its classification, Pharmacodynamic and pharmacokinetic aspects, adverse effects, therapeutic uses.

CO2: Acquire knowledge about dose, route of administration, precautions, and contraindications.

CO3: Understood the pharmacological aspects of drugs used to treat ailment of different organ systems of the body.

CO4: Appreciate the importance of drug discovery by preclinical and clinical trials.

CO5: Appreciate the importance of pharmacology subject as a basis of therapeutics.

CO6: Apply the knowledge of drugs and its detailed description therapeutically in clinical case scenario.

2.5 Community Pharmacy

Upon completion of the course student shall be able to

CO1: Know pharmaceutical care services.

CO2: Know the business and professional practice management skills in community pharmacies.

CO3: Do patient counseling & provide health screening services to public in community pharmacy.

CO4: Respond to minor ailments and provide appropriate medication.

CO5: Show empathy and sympathy to patients.

CO6: Appreciate the concept of Rational drug therapy.

2.6 Pharmacotherapeutics– I

Upon completion of the course student shall be able to

Co1: Describe the pathophysiology and management of cardiovascular, respiratory and endocrine diseases

Co2: Developing Patient case based Assessment Skills

Co3: Describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases

Co4: Developed clinical skills in the therapeutic management of these conditions.

CO5: Provide patient-centered care to diverse patients using the evidence based medicine.

Pharm.D. III Year

3.1 Pharmacology -II

Upon completion of the course student shall be able to

CO1: Learnt about drugs used to cancer, inflammation, respiratory system, GIT, immune system and hormones.

CO2: Understood the principles of animal toxicology and bioassay procedures.

CO3: Learnt in depth knowledge on cell, macromolecules, cell signaling, DNA replication and cell cycle.

CO4: Appreciate the importance of gene and its structure, genome, gene expression, recombinant DNA technology and other associated aspects.

CO5: Learnt to apply the knowledge of drugs practically using simulated pharmacological experiments.

3.2 Pharmaceutical Analysis

Upon completion of the course student shall be able to

CO1: Understand the importance of analysis in pharmaceutical industry.

CO2: Understand the knowledge about assay of pharmaceutical substance and product.

CO3: Develop basic practical skills using instrumental techniques.

CO4: Acquire knowledge on various instrumental techniques adopted for analysis of pharmaceuticals.

CO5: Develop various methodologies for assay of drugs and pharmaceuticals with the skills and knowledge gained.

CO6: Understand and gain knowledge on trouble shooting in adopting various methodologies using instrumental techniques.

3.4 Pharmacotherapeutics – II

Upon completion of the course student shall be able to

CO1: Know the pathophysiology of selected disease states and the rationale for drug therapy.

CO2: Know the therapeutic approach to management of these diseases.

CO3: Know the controversies in drug therapy.

CO4: Know the importance of preparation of individualised therapeutic plans based on diagnosis.

CO5: Appreciate the needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy.

3.5 Pharmaceutical Jurisprudence

Upon completion of the course student shall be able to

CO1: Do practice the Professional ethics;

CO2: Understand the various concepts of the pharmaceutical legislation in India;

CO3: Know the various parameters in the Drug and Cosmetic Act and rules;

CO4: Know the Drug policy, DPCO, Patent and design act;

CO5: Understand the labeling requirements and packaging guidelines for drugs and cosmetics;

CO6: Understand the concepts of Dangerous Drugs Act, Pharmacy Act and Excise Duties Act;

CO7: Know laws as prescribed by the Pharmacy Council of India from time to time including international laws.

3.6 Medicinal Chemistry

Upon completion of the course student shall be able to

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

CO2: Know the metabolism, adverse effect and therapeutic activity of drugs.

CO3: Understand the different modern techniques of drug design.

CO4: Appreciate the SAR of some important drug classes.

CO5: Acquire knowledge in the chemotherapy for cancer and microbial diseases and different anti-viral agents.

3.7 Pharmaceutical Formulations

Upon completion of the subject student shall be able to

CO1: Understand the principle involved in formulation of various pharmaceutical dosage forms.

CO2: Prepare various pharmaceutical formulation.

CO3: Perform evaluation of pharmaceutical dosage forms.

CO4: Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.

Pharm.D. IV Year

4.1 Pharmacotherapeutics -III

Upon completion of the subject student shall be able to

CO1: Understand pathophysiology of selected disease states and the rationale for drug therapy.

CO2: Understand therapeutic approach to management of these diseases;

CO3: Understand the controversies in drug therapy.

CO4: Know the importance of preparation of individualized therapeutic plans based on diagnosis.

CO5: Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy.

4.2 Hospital Pharmacy

Upon completion of the subject student shall be able to

CO1: Know various drug distribution methods.

CO2: Know the professional practice management skills in hospital pharmacies.

CO3: Provide unbiased drug information to the doctors.

CO4: Know the manufacturing practices of various Formulations in hospital set up.

CO5: Appreciate the practice based research methods.

CO6: Appreciate the stores management and inventory control.

4.3 Clinical Pharmacy

Upon completion of the subject student shall be able to

CO1: Monitor drug therapy of patient through medication chart review and clinical review.

CO2: Obtain medication history interview and counsel the patients.

CO3: Identify and resolve drug related problems.

CO4: Detect, assess and monitor adverse drug reaction.

CO5: Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.

CO6: Retrieve, analyze, interpret and formulate drug or medicine information.

4.4 Biostatistics & Research Methodology

Upon completion of the subject student shall be able to

CO1: Know the various statistical methods to solve different types of problems.

CO2: Operate various statistical software packages.

CO3: Appreciate the importance of Computer in hospital and Community Pharmacy.

CO4: Appreciate the statistical technique in solving the pharmaceutical problems.

4.5 Biopharmaceutics & Pharmacokinetics

Upon completion of the subject student shall be able to

CO1: Broader understanding about the concepts of biopharmaceutics and pharmacokinetics.

CO2: Ability to calculate the various pharmacokinetic parameters by using various mathematical models.

CO3: Ability to design a basic protocol for the conduct of BA/BE study and the interpretation of the BA/BE data

CO4: Preparedness to use the concepts of pharmacokinetic principles in the clinical contexts.

CO5: Ability to design and perform *in-vitro* dissolution studies for various drugs as per the standards of official monographs

CO6: Basic understanding about the concepts of *in-vitro* - *in-vivo* correlations (IVIVC)

4.6 Clinical Toxicology

Upon completion of the subject student shall be able to

CO1: Developing general working knowledge of the principles and practice of clinical toxicology.

CO2: Demonstrating an understanding of the health implications of toxic exposures and commonly involved chemicals for toxicity.

CO3: Demonstrating and applying an understanding of general toxicology principles and clinical management practice.

CO4: Demonstrating and applying an understanding of the history, assessment, and therapy considerations associated with the management of a toxic exposure.

CO5: Demonstrating and apply an understanding of the characteristics of and treatment guidelines for specific toxic substances.

CO6: Proposing several preventive approaches to reduce unintentional poisonings.

CO7: Enabling the pharmacist to function as contributing health care team member when faced with a toxic exposure experience, including emergencies.

Pharm.D. V Year

5.1 Clinical Research

Upon completion of the subject student shall be able to

CO1: Know the new drug development process.

CO2: Understand the regulatory and ethical requirements.

CO3: Appreciate and conduct the clinical trials activities.

CO4: Know safety monitoring and reporting in clinical trials.

CO5: Manage the trial coordination process.

CO6: Know the new drug development process.

CO7: Understand the regulatory and ethical requirements.

CO8: Appreciate and conduct the clinical trials activities.

CO9: Know safety monitoring and reporting in clinical trials.

CO10: Manage the trial coordination process.

5.2 Pharmacoepidemiology & Pharmacoeconomic

Upon completion of the subject student shall be able to

CO1: Describe the methods used in Pharmacoepidemiology

CO2: Demonstrate competency in the design, conduct and evaluation of Pharmacoepidemiology studies.

CO3: Describe the methods used in Pharmacoeconomic analysis.

CO4: Demonstrate competency in the design, conduct and evaluation of Pharmacoeconomic studies.

5.3 Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring

Upon completion of the subject student shall be able to

CO1: Ability to apply the concepts of Pharmacokinetics to individualize the drug dosage regimen in clinical settings.

CO2: Ability to design a dosage regimen of a drug based on its route of administration.

CO3: Ability to design and implement pharmacokinetic services such as

- Intravenous to Oral conversion of dosage regimen
- Therapeutic Drug Monitoring Services

CO4: Broader understanding about the significance of altered pharmacokinetics, Pharmacogenetics and Pharmacometrics.

CO5: Ability to adjust the dosage regimen for patients with renal / hepatic impairments

CO6: Ability to assess the drug interaction issues in the clinical settings

CO7: Ability to design and implement therapeutic drug monitoring services for various drugs

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College Code: SDIP

M.PHARMACY

M.PHARM (PHARMACEUTICS)

I YEAR I SEMESTR

CORE COURSE I Advanced Physical Pharmaceutics

Upon completion of the subject student shall be able to

CO1: Apply the principles of physical and chemical properties of particle science, polymer science and their use in pharmaceutical dosage forms.

CO2: Know the compression and consolidation parameters for powders and granules.

CO3: Acquired knowledge about the rheology, disperse systems, dissolution and solubility related parameters for dosage forms.

CORE COURSE II Modern Pharmaceutics - I

Upon completion of the subject student shall be able to

CO1: Understand element of preformulation study.

CO2: Acquired knowledge about active pharmaceutical ingredients and generic product development.

CO3: Know industrial management and GMP consideration.

CO4: Learn optimization techniques and pilot plant scale up techniques.

CO5: Acquired knowledge about stability testing and sterilization process and packaging of dosage form.

CORE COURSE III Applied Biopharmaceutics & Pharmacokinetics

Upon completion of the subject student shall be able to

CO1: Learn about bioavailability, bioequivalence and factor affecting bioavailability.

CO2: Learn the pharmacokinetic parameter like drug disposition, absorption, nonlinear and time dependent pharmacokinetics.

CO3: Understand about the drug interactions & problems, practice associated in pharmacokinetic parameters calculations.

CORE ELECTIVE I Intellectual Property Rights

Upon completion of the subject student shall be able to

CO1: Understand the concept of intellectual property rights.

CO2: Develops procedural knowledge to Legal System and solving the problem relating to intellectual property rights.

CO3: Pursue the professional programs in Company Secretaryship.

CO4: Employability as the Compliance Officer, Public Relation Officer and Liaison Officer.

CO5: Establishment of Legal Consultancy and service provider.

OPEN ELECTIVE I Pharmacoepidemiology & Pharmacoeconomics

Upon completion of the subject student shall be able to

CO1: Understand risk of pharmacoepidemiology history and need of pharmacoeconomics and assessment of pharmacovigilance.

I YEAR II SEMESTR

CORE COURSE IV Advanced Drug Delivery Systems

Upon completion of the subject student shall be able to

CO1: Know the different types of Drug carrier used in the process of drug delivery which serves to improve the selectivity, effectiveness, and/or safety of drug administration.

CO2: Know the latest drug delivery knowledge and think to develop new formulation based on the individual Requirement.

CO3: Know recent developments in protein and peptide for parenteral delivery approaches will give new dimension of drug deliver for antibiotics, insulin, etc.

CORE COURSE V Industrial Pharmacy

Upon completion of the subject student shall be able to

CO1: Explain the machinery involved in milling, mixing, filteration, drying and packing material constructions used in the production of pharmaceutical materials.

CO2: Learn salient features of GMP, TQM applicable in industry. They also understand the effluent treatments and prevent the pollution.

CO3: Evaluate the validation of analytical methods and processes.

CORE COURSE VI Modern Pharmaceutics - II

Upon completion of the subject student shall be able to

CO1: Understand the planning of pilot plant techniques used for all pharmaceutical dosage forms such as tablets, capsules, parenterals, aerosols, cosmetics and neutraceuticals.

CORE ELECTIVE II Biostatistics & Research Methodology

Upon completion of the subject student shall be able to

CO1: Known the Biostatistics arrangement, presentation and formation of tables and charts.

CO2: Know the correlation and regression & application of different methods, analysis of data and also learn how to write dissertation, thesis and Research paper.

OPEN ELECTIVE II Screening Methods in Pharmacology

Upon completion of the subject student shall be able to

CO1: Know how to handle animals and know about various techniques for screening of drugs for different pharmacological activities, guidelines and regulations for screening new drug molecules on animals.

PHARMACEUTICAL ANALYSIS

I YEAR I SEMESTR

CORE COURSE I Advanced Pharmaceutical Analysis

Upon completion of the subject student shall be able to

CO1: Understand the concepts of Impurity profiling.

CO2: Gain appropriate knowledge about appropriate analytical skills required for the analysis of impurities in the bulk drugs and various formulations.

CO3: Categorizing the impurities like (inorganic, organic and residual solvents)

CO4: It supports to understand the official and non-official methods to analyses the related substance.

CORE COURSE II Food Analysis

Upon completion of the subject student shall be able to understand various analytical techniques in the determination of

CO1: Food constituents

CO2: Food additives

CO3: Finished food products

CO4: Pesticides in food **CO5:** Knowledge on food regulations and legislations.

CORE COURSE III Modern Pharmaceutical Analytical Techniques

Upon completion of the subject student shall be able

CO1: Understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical instruments.

CO2: Develop basic practical skills using instrumentation techniques.

CO3: Selecting the suitable techniques for analysis of drugs and pharmaceuticals.

CO4: Expand the theoretical knowledge on various instrumental techniques available for analysis of organic substances.

CO5: Apply the knowledge learnt in developing new procedures of their own design Comparing various methods of analysis and their outcomes.

CORE ELECTIVE I Intellectual Property Rights

Upon completion of the subject student shall be able

CO1: Know different Acts and guidelines that regulate Drugs & Cosmetics, Medical Devices, Biologicals & Herbals, and Food & Nutraceuticals industry in India.

CO2: Understand the approval process and regulatory requirements for Drugs & Cosmetics, Medical Devices, Biologicals & Herbals, and Food& Nutraceuticals.

OPEN ELECTIVE I Pharmacoepidemiology & Pharmacoeconomics

Upon completion of the subject student shall be able to

CO1: Understand risk of pharmacoepidemiology history and need of pharmacoeconomics and assessment of pharmocovigilance.

I YEAR II SEMESTR

CORE COURSE IV Advanced Instrumentation Techniques

Upon completion of the subject student shall be able to know about

CO1: The detailed interpretation pattern for the organic substances.

CO2: Theoretical aspects of the HPLC and GC techniques.

CO3: Practical aspects and troubleshooting techniques for HPLC and GC techniques.

CO4: Knowledge and skills in advanced instrumentation techniques for drug analysis.

CO5: Theoretical aspects of hyphenated analytical techniques.

CO6: Critical analysis of analytical problem and selection of appropriate analytical tool for the quantification of chemicals and excipients.

CORE COURSE V Quality control and Quality Assurance

Upon completion of the subject student shall be able

CO1: Understand the cGMP aspects in a pharmaceutical industry.

CO2: Understand the importance of documentation.

CO3: Understand the scope of quality certifications applicable to Pharmaceutical industries.

CO4: Understand the responsibilities of QA department.

CO5: Student shall be able to understand the responsibilities of QC department.

CO6: Student shall be able to understand GLP and regulatory Affairs.

CORE COURSE VI Modern Bio-Analytical Techniques

Upon completion of the subject student shall be able to know about

CO1: Extraction of drugs from biological samples.

CO2: Separation of drugs from biological samples using different techniques.

CO3: Guidelines for BA/BE studies.

CORE ELECTIVE II Biostatistics and Research Methodology

Upon completion of the subject student shall be able to

CO1: The student will be known the Biostatistics arrangement, presentation and formation of tables and charts.

CO2: They also know the correlation and regression & application of different methods, analysis of data and also learn how to write dissertation, thesis and Research paper.

OPEN ELECTIVE II Screening Methods in Pharmacology

Upon completion of the subject student shall be able to

CO1: Know how to handle animals and know about various techniques for screening of drugs for different pharmacological activities, guidelines and regulations for screening new drug molecules on animals.

REGULATORY AFFAIRS

I YEAR I SEMESTR

CORE COURSE I Pharmaceutical Management - I

Upon completion of this course students will be able to understand/ have knowledge of

CO1: Pharmaceutical Industry – Indian and Global.

CO2: Management concepts.

CO3: Marketing concepts.

CO4: Principles of accounting.

CO5: Economics.

CO6: Production and material management.

CO7: Total quality management.

CO8: Entrepreneurship development.

CO9: Case analysis

CORE COURSE II Drug Regulatory Affairs

Upon completion of the subject student shall be able to

CO1: Know different Acts and guidelines that regulate Drugs & Cosmetics, Medical devices, Biologicals & Herbals, and Food & Nutraceuticals industry in India.

CO2: Understand the approval process and regulatory requirements for Drugs & Cosmetics, Medical Devices, Biologicals & Herbals, and Food & Nutraceuticals

CO3: Know the various documents pertaining to drugs in pharmaceutical industry

CO4: Understand the basics of regulatory compilation

CO5: Create and assemble the regulation submission as per the requirements of agencies

CORE COURSE III Modern Pharmaceutical Analytical Techniques

Upon completion of the subject student shall be able to

CO1: Know Chemicals and Excipients.

CO2: Know analysis of various drugs in single and combination dosage forms.

CO3: Know theoretical and practical skills of the instruments.

CORE ELECTIVE I Intellectual Property Rights

Upon completion of the subject student shall be able to

CO1: Understand the concept of intellectual property rights.

CO2: Develops procedural knowledge to Legal System and solving the problem relating to intellectual property rights.

CO3: Pursue the professional programs in Company Secretaryship.

CO4: Employability as the Compliance Officer, Public Relation Officer and Liaison Officer.

CO5: Establishment of Legal Consultancy and service provider.

Cosmetics, Medical Devices, Biologicals & Herbals, and Food& Nutraceuticals.

OPEN ELECTIVE I Pharmacoepidemiology & Pharmacoeconomics

Upon completion of the subject student shall be able to

CO1: Understand risk of pharmacoepidemiology history and need of pharmacoeconomics and assessment of pharmocovigilance.

I YEAR II SEMESTR

CORE COURSE IV Pharmaceutical management - II

Upon completion of the subject student shall be able to

CO1: Acquired knowledge about production management, production planning and control.

CO2: Design and development of packaging, marketing of pharmaceuticals.

CORE COURSE V Analytical Method Validation, Copy Rights, And Trade Marks

Upon completion of the subject student shall be able to

CO1: Acquired knowledge about ICH guidelines for validation, FDA drafts and techniques which are used for validation and their implementation.

CO2: Know the rights and laws related to copyrights and trademarks.

ORE COURSE VI Pharmaceutical Market Research and Analysis

Upon completion of the subject student shall be able to

CO1: Acquired knowledge about global market, growth calculations depending on regions, market promotion datas, patent extensions, analysis of finished dosage forms and APIs.

CO2: Know data base related to strategies of companies.

CORE ELECTIVE II Biostatistics and Research Methodology

Upon completion of the subject student shall be able to

CO1: The student will be known the Biostatistics arrangement, presentation and formation of tables and charts.

CO2: They also know the correlation and regression & application of different methods, analysis of data and also learn how to write dissertation, thesis and Research paper.

OPEN ELECTIVE II Screening Methods in Pharmacology

Upon completion of the subject student shall be able to

CO1: Know how to handle animals and know about various techniques for screening of drugs for different pharmacological activities, guidelines and regulations for screening new drug molecules on animals.