Course Outcomes

Course : PHARMACETICS-I(GENERAL AND DISPENSING) - [C101]	
CO1	Explain the concept of pharmacy. introduction to various pharmacopoeias, status of pharma industry in India
CO2	Outline various pharmacological terms, understand the concept of dosage form and its need, various routes of drug administration.
CO3	Outline prescription and its parts, handling of prescription, concept of containers and closures.
CO4	Outline the concept of posology, its meaning, dose calculation with reference to ageing.
CO5	Introduction to various liquid, semisolid dosage form, its labeling and storage.

Course : PHARMACEUTICAL CHEMISTRY-I(INORGANIC) - [C102]	
CO1	Describe the methods of preparation,usees,sources of impurities & purity including limit test of chloride,sulphates,lead.arsenic,heavy metals and acids,bases,buffers,antioxidants and water.
CO2	Outline the major intra & extra cellular electrotes,use of electrolytes in replacement and acid base thearapy.
CO3	Explain & outline the gastrointestinal agents like acidifying agents,antacids,protectives and adsorbents,saline cathartics.
CO4	Describe in detail topical agents (protectives, antimicrobial &astringent) &dental products.
CO5	Explain the radiopharmaceuticals, its measurement & application,poison &antidotes,respiratory stimulants,expectorant &emetics,tableting & suspending agents.

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Course : HUMAN ANATOMY AND PHYSIOLOGY-I - [C103]	
CO1	Summarize the human anatomy and physiology,levels of structural organisation.
CO2	Summarize the cell physiology,structure and function of plasma membrane and cell organelles. Summarize different types of tissues and itscharacterisation.
CO3	Summarize the composition and function of blood, formation of rbc,wbc,and their physiological role, mechanism of blood coagulation and blood groups.
CO4	Summarize the anatomy of heart, action potential & contraction of contractile fibers,conducting system,ecg, cardiac cycle,blood vessels and circulation, blood pressure- maintenance and regulation.
CO5	Summarize the composition, functions and circulation of lymph, lymph node (structure and function), spleen (structure and function)
CO6	Summarize the anatomy of respiratory organs and their functions, exchange gases, transport of respiratory gases,regulation of respiration, respiratory volumes and vital capacity.

Course : PHARMACEUTICAL BIOCHEMSITRY - [C104]	
CO1	Explain basics of biomolecules and bioenergetics
CO2	Explain fundamental of structures, metabolism and blood glucose regulation of carbohydrates.
CO3	Outline concept of biological oxidation
CO4	To explore basics of reactions, properties structures & breakdown of proteins and lipids.
CO5	Outline fundamentals of nucleic acids including concept of dna, rna, bases, roles & synthesis.

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Course : PHARMACOGNOSY AND PHYTOCHEMISTRY-I - [C105]	
CO1	Extend scope of pharmacognosy classify crude drug summarize adulteration and its types.
CO2	Explain cell differentiation outline ergastic cell content
CO3	Summarize different plant and metabolite extend shikimic acid pathway
CO4	Outline study of organized crude drug
CO5	Explain alternative system of medicine

Course : HOSPITAL PHARMACY - [C106]	
CO1	Explain organization, management, hospital drug policy and hospital pharmacy services as core part of hospital pharmacy
CO2	To analyze drug distribution system, central sterile services, use of health accessories in hospital
CO3	To explore knowledge regarding drug house management, and channels of distribution for drugs
CO4	Outline concept and function of community pharmacy and patient counseling

Course : PHARMACEUTICS-I(GENERAL AND DISPENSING)[PRACTICAL] - [P101]	
CO1	Develop various dosage form and its formulation, preparation and labeling of solid dosage form
CO2	Develop various dosage form and its formulation, preparation and labeling of semisolid and liquid dosage form

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Course : PHARMACEUTICAL CHEMISTRY-I(IORGANIC)[PRACTICAL] - [P102]	
CO1	To introduce the glassware's used in pharmaceutical laboratory
CO2	Outline the limit test of chloride sulphate, iron and heavy metal.
CO3	Outline the method of preparation and identification test of inorganic pharmaceuticals(boric acid,calcium carbonate, barium sulphate, aluminium hydroxide, potassium citrate and ferrous sulphate)

Course : HUMAN ANATOMY AND PHYSIOLOGY-I (PRACTICAL) - [P103]	
CO1	Outline microscope and microscopic study of different types of tissues
CO2	Determination of different blood associated parameters.
CO3	Explain anatomy and physiology of different human system through models/charts/ specimen

Course : PHARMACEUTICAL BIOCHEMISTRY - [P104]	
CO1	To introduce carbohydrates with its identification test.
CO2	Explain concept of test of lipids.
CO3	To introduce proteins and amino acids with identification test.
CO4	To estimate glucose and creatinine concentration.

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY-I(PRACTICAL) - [P105]	
CO1	Illustrate laboratory microscope show plant tissue system
CO2	Demonstrate morphology and microscopy of various plant

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Course : PHARMACEUTICS-II(GENERAL AND DISPENSING) - [C107]	
CO1	Explain the concept disperse system (emulsion and suspension), how it works, its advantages and disadvantages, storage criteria
CO2	Explain powder dosage form , study of tablets and capsules, its formulation and evaluation, study of various weights and measurements used in pharmaceutical system
CO3	Illustrate concept of surgical dressings, its standards, and preparation. Outline concept of suppository dosage form
CO4	Explain blood products and plasma substitutes and various extraction process of drug

Course : PHARMACEUTICAL CHEMISTRY-II (ORGANIC) - [C108]	
CO1	Outline the concept of electronic configuration, hybridization, electronegativity, various bonds, sources and properties of molecules.
CO2	Explain various methods of detection and estimation of elements, formulaes, nomenclature and uses of various compounds.
CO3	Illustrate the concept of isomerism, various projections, configurations, strain theory.
CO4	Explain the concept of chemical reactions, functional groups, types of reaction.

Course : HUMAN ANATOMY AND PHYSIOLOGY-II - [C109]	
CO1	Illustrate the anatomy and physiology of organs of digestive system. role of salivary glands, stomach, small intestine, large intestine, pancreas and liver in digestion and absorption of carbohydrate, protein and fats.
CO2	Illustrate organization and function of neuron and different parts of brain, spinal cord, cranial nerve, autonomic nervous system.
CO3	Explain anatomy and physiology of urinary system, structure of nephron, formation of urine, micturition, and renin angiotensin system.
CO4	Outline the physiology of hormones of hypothalamus-pituitary gland, adrenal gland, thyroid gland, pancreas and gonads.
CO5	Sketch the structure and function of skin and explain regulation of body temperature.
CO6	Explain the anatomy and physiology of special senses.

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Course : PHARMACEUTICAL ANALYSIS-I - [C110]	
CO1	Outline the concept of quantitative analysis i.e, different techniques of analysis, methods of expressing concentration, primary and secondary standard , precision and accuracy, concept, classification and minimization of errors.
CO2	Explain neutralization and indicator theory, neutralization curves, advantages, and limitations of nonaqueous titrations, nonaqueous solvent, and acidimetry, alkalimetry in nonaqueous titrations
CO3	Summarize redox titrations i.e iodimetry ,iodometry,ceriometry,permangnate titrations and detection of end point in redox titrations.
CO4	Elaborate on practical aspects of gravimetric analysis i.e precipitation, digestion, filtration, washing , drying, purity of precipitate and thermogravimetry.
CO5	Explain the precipitation titration methodsi.e mohr's method,volhard;s method and adsorption indicators.
CO6	Outline the theory of metal ion indicators, types of edta, selectivity, masking and demasking and applications of complexometry in pharmaceuticals.

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY-II - [C111]	
CO1	Illustrate carbohydrates from natural resources and relate its importance in pharmaceutical formulation
CO2	Summarize lipid and demonstrate its use as natural excipients
CO3	Outline enzymes, natual fibres, drugs of minerals, herbomineral and animal origin.relates its importance in pharmaceutical industry.

Course : STATISTIC AND COMPUTER APPLICATION IN PHARMACY - [C112]	
CO1	Explain basic understanding and practice of statistics
CO2	Illustrate basic understanding of computers fundamentals
CO3	Outline knowledge of operating system, ms-office and internet and networking
CO4	Explain applications of computers in pharmacy

Course : PHARMACEUTICS-II (PRACTICAL) - [P107]	
CO1	Explain formulation, preparation and labeling of emulsion, suppositories, mixtures, tinctures, eye drops, ear drops, nasal drops and powders.
CO2	Outline formulation, preparation and labeling of tooth powders ,gargles, mouthwash, inhalation, throat paint, enemas, poultice, capsule, douches, granules and linctus.

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Course : Pharmaceutical Chemistry-II (Organic) (PRACTICAL) - [P108]	
CO1	Explain various apparatus used in laboratory.
CO2	Outline about safety in laboratory practices.
CO3	Calculate melting point and boiling point.
CO4	Identify unknown organic compound.
CO5	Synthesize various compounds.

Course : Human Anatomy and Physiology-II (PRACTICAL) - [P109]	
CO1	Outline of human skeleton system and demonstration of simple muscle curve, effect of temperature on muscle contraction and muscle fatigue curve using computer software.
CO2	Compute own body temperature and perform urine analysis. Explain first aid measures, and anatomy and physiology of different organ systems.
CO3	Demonstrate microscopic section of different types of tissues.

Course : Pharmaceutical Analysis-I (PRACTICAL) - [P110]	
CO1	Compute molar concentration of given solution and calculate the concentration and purity of given sample by acid base and non-aqueous and redox titration.
CO2	Experiment with an analyte to compute its concentration by precipitation , complexometric and gravimetric analysis

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY-II(PRACTICAL) - [P111]	
CO1	Make use of morphological characteristics, chemical test to identify carbohydrate, lipid, fixed oil,and fibres containing crude drug
CO2	Identify adulteration of fixed oil by chemical test
CO3	Choose method for isolation of starch from potato and determination of swelling factor of isapghula seeds

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Course : PHARMACEUTICS III - [C201]	
CO1	Explain the theories and objective of size reduction and size separation with examples of equipment.
CO2	Illustrate the types of mixtures, equipments used in mixing of powders, liquids and semi-solids
CO3	Illustrate the knowledge of mass- transfer in turbulent and laminar flow with respect to fluid statics, dynamics and transportation of fluid.
CO4	Outline the various equipments for transportation solid.
CO5	Apply the knowledge of mechanisms and types of filtration, theories of filtration and examples of equipment. the principle of centrifugation and equipments used in centrifugation

Course : PHARMACEUTICAL CHEMISTRY III (ORGANIC) - [C202]	
CO1	To explain method of preparation, reactions, mechanism of reactions of alkanes, alkynes, cycloalkanes, alkyl halide.
CO2	Illustrate the preparation and reaction, mechanism, of aldehydes, ketones, aliphatic and aromatic amines
CO3	Explain preparation and synthetic application of organic mettalic compound and illustrate chemistry of aromatic hydrocarbons and electrophilic aromatic substitution.
CO4	Outline and contrast the method of preparation and reactions of phenols, carboxylic acids and their derivatives

Course : PATHOPHYSIOLOGY AND CLINICAL BIOCHEMISTRY - [C203]	
CO1	Explain the basic concept of cell injuries and its morphological changes
CO2	Outline the concept of inflammation process, mediators and its repair
CO3	Summarize the pathophysiology of common diseases and its detection test
CO4	Explain the concept of sexually transmitted diseases and its prevention

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Course : PHARMACOLOGY I - [C204]	
CO1	To make understand basic concept of pharmacology, drug receptor interactions and drug action on body
CO2	Outline and understand cellular concept of pharmacokinetics
CO3	Outline and understand a concept of pharmacodynamics
CO4	Summarize the different process involved in neurohumoral transmission
CO5	Outline the effect of neurotransmitters from autonomic nervous system
CO6	Outline and understand different principle of bio-assay and its application

Course : PHARMACEUTICAL MICROBIOLOGY AND IMMUNOLOGY I - [C205]	
CO1	Study and measurement of the bacterial growth, identification and preservation of microbial cultures and study of bacterial genetics and recombination in bacteria.
CO2	Study of microbiology of fungi including classification, nutrition and reproduction
CO3	Summarize about microbiology of viruses including structure, bacteriophage, cultivation and multiplication of human viruses.
CO4	Outline etiology, pathophysiology, transmission, prevention and treatment of microbial diseases like tuberculosis, aids, leprosy, syphilis, influenza, typhoid, malaria, cholera and fungal infections

Course : PHARMACEUTICAL JURISPRUDENCE AND ETHICS - [C206]	
CO1	Explain historical background, scope and objectives of drug legislation in india. Summarize professional ethics related to pharmacy.
CO2	Outline composition and function of pci and state pharmacy councils. Explain education regulation & offences and penalties against violating pharmacy act 1948.
CO3	Summarize rules and regulations of medicinal and toilet preparation act 1955, rules 1976 and drug price control order. Outline rules governing prohibited advertisements under drugs and magic remedies act 1954.
CO4	Outline about different governing bodies like dtab, dcc and licensing authorities. Summarize provision governing import, manufacturing and sale of drugs and different schedule of drug.
CO5	Outline rules and regulations controlling operation, cultivation, sale, import and export of narcotic and psychotropic substances. Explain consumer protection act, rules and regulations regarding medical termination of pregnancy.

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Course : PHARMACEUTICS III (P) - [P201]	
CO1	Explain and demonstrate the particle size distibution, particle sedimentation, effect of filter aid on filtration and centrifugation and sedimentation behavior of suspending agent.
CO2	Apply the knowledge of engineering drawing sheets to draw alphabets and numbering, and geometric constructions

Course : PHARMACEUTICAL CHEMISTRY III (ORGANIC) (P) - [P202]	
CO1	Explain methodology to detect functional group present in organic compound
CO2	Identify organic compound and synthesize the derivative of identified compound
CO3	Synthesize organic compound like picric acid, p-iodonitrobenzene, 1-phenyl azo-2-napthol, benzamide and explain mechanism of synthesis

Course : PATHOPHYSIOLOGY AND CLINICAL BIOCHEMISTRY (P) - [P203]	
CO1	Demonstrate various method of withdrawal of blood,study of various anticoagulants used in preservation of blood
CO2	Experiment with various identification test and estimation of normal and abnormal constituents in serum and urine.

Course : PHARMACOLOGY I (P) - [P204]	
CO1	Summarize different laboratory instruments used in experimental phrmacology and preparation of different physiological salt solution,its uses in experimental setup
CO2	Illustrate dissection of animal and isolation of different tissues used for experimental pharmacology and to plot crc.
CO3	Outline effects of local anesthesia, euthanasia and ethics involved on experimental animal.

Course : PHARMACEUICAL MICROBIOLOGY AND IMMUNOLOGY I (P) - [P205]	
CO1	Evaluate the bacterial growth and to identify and preserve microbial cultures.
CO2	Illustrate microbiology of fungi including classification, nutrition and reproduction
CO3	Contrast microbiology of viruses including structure, bacteriophage, cultivation and multiplication of human viruses.
CO4	Summarize etiology, pathophysiology, transmission, prevention and treatment of microbial diseases like tuberculosis, aids, leprosy, syphilis, influenza, typhoid, malaria, cholera and fungal infections.

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Course : Pharmaceutics-IV (Unit Operations) - [C207]	
CO1	Explain the mechanisms and laws of heat transfer, heat transfer- between fluid & solid boundary, boiling liquids, condensing vapour's, heat exchangers and heat interchangers
CO2	Apply theory of evaporation and drying for studying of equipments used for evaporation and drying.
CO3	Illustrate the roult's law, henry's law and dalton's law, volatility and relative volatility and various type of distillation
CO4	Explain the theory of crystallization, mier's theory and its limitations, nucleation and crystal growth, study of various equipment used for crystallization
CO5	Explain the theory of humidification and dehumidification, study of air conditioning, refrigerants and refrigeration cycle and Outline the mechanism and factors influencing corrosion process, method of combating it.

Course : Pharmaceutical Chemistry-IV (Heterocyclic and Macromolecules) - [C208]	
CO1	Explain heterocyclic compounds (including its structure,nomenclature,synthesis and reaction, stereochemistry) likepyrrole, furan, thiophene, imidazole, oxazole, pyrridine, pyrimidine,quinoline, isoquinoline, indole, purine and phenothiazine
CO2	Illustrate polyneuclear aromatic hydrocarbon like nahthalene, anthracene and phenantrene.
CO3	Classify structure, configuration, mutarotation, of glucose, study of structure of maltose, sucrose, starch, simple, glycosides like salsin &amygdalin.
CO4	Explain classification, isolation and synthesis of amino acids, isolation, purification and hydrolysis of poly peptides, classification, properties and structure of protein.
CO5	Elaborate the classification and general chemistry of lipids and fats, their properties and characterization, fatty acids with reactions, waxes, phospholipids, glycolipids, lipoproteins.

Course : Pharmaceutical Analysis II - [C209]	
CO1	Explain the concept of refractometry, factors, terminology and its instrumentation
CO2	Explore the concept of potentiometry, mechanism of electrode potential, types of electrodes, methods, advantages, types and applications.
CO3	Summarize the concept of polarography, terminology, instrumentation, equation, current potential electrode, DME, applications and others techniques.
CO4	Outline the concept of amperometry, its principle, instrumentation, electrodes and applications.
CO5	Outline the concept of polarimetry and conductometry with its instrumentation, measurement and applications.

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Course : Pharmacology-II - [C210]	
CO1	Illustrate mechanism of drug action and its relevance in the treatment of cvs disorder
CO2	Summarize and understand mechanism of drug action and its relevance in the treatment of urinary system associated disorders.
CO3	Summarize and understand basic concept of autacoids and related drugs associated disorders.
CO4	Summarize and understand mechanism of drug action and its relevance in the treatment of haemepoetic system andassociated disorders.

Course : Pharmaceutical Microbiology and Immunology-II - [C211]	
CO1	Outline sterilization methods, sterilization indicators along with d-value, z-value and sterility testing as per i. p.
CO2	Outline disinfection including classification, dynamics, factors and evaluation of disinfectants
CO3	Outline aseptic techniques including design of aseptic area, sources of contamination and their prevention along with laminar air flow
CO4	Outline fundamentals of immunology, antigen-antibody reaction and hypersensitivity reaction
CO5	Summarize preparation of vaccines and sera including introduction, manufacture and quality control

Course : Pharmaceutical Management - [C212]	
CO1	Explain and practice the fundamentals of management and material management.
CO2	To comprehend the concept of pharmacoeconomics and pharmaceutical marketing.
CO3	Explain and practice principles of salesmanship and accountancy.
CO4	Summarize the fundamentals of production management and human resources management.

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Course : Pharmaceutics-IV (Unit Operations) (Practical)) - [P207]	
CO1	Illustrate the effect of pressure and viscosity on rate of evaporation, drying with crystallization by seeding and without seeding, draw boiling point curve
CO2	Apply the knowledge of engginiring drawing for drawing orthogonal projection

Course : Pharmaceutical Chemistry-IV (Heterocyclic and Macromolecules) (Practical)) - [P208]	
CO1	Summarize the synthesisi of pthlimide, benzotriazole,benzimidazole and flurescein
CO2	Outline the analysis of oils and fats.
CO3	Outline the quantitative determination of organic compounds via functional groups

Course : Pharmaceutical Analysis-II (Electroanalytical and Physical methods) (Practical) - [P209]	
CO1	Explain basics of instrumentation and standardization process.
CO2	Explain fundamental of pH meter and conductometer with its titrations.
CO3	Outline concept of refractometry.
CO4	Explore basics of polarimeter and various principles of titarions.

Course : Pharmacology-II (Practical) - [P210]	
CO1	Outline of commonly used animals in experimental pharmacology
CO2	Outline practical knowledge of animal handling, animal care, dose calculation, and dose administration in pharmacology.
CO3	Summarize the practical knowledge on different techniques, blood collection from experimental animal.
CO4	Summarize the practical knowledge of cdrc determination by using different tissue preparation.
CO5	Summarize the practical knowledge of different bioassay processes and its application.
CO6	Summarize the knowledge of ethics and regulation involved in usage of animals

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Course : Pharmaceutical Microbiology and Immunology-II (Practical)) - [P211]	
CO1	Summarize about sterilization and sterility testing as per i. p.
CO2	Study of disinfection, factors and evaluation of disinfectants
CO3	Study of aseptic techniques including design of aseptic area, sources of contamination and their prevention along with laminar air flow
CO4	Study of fundamentals of immunology, antigen-antibody reaction and hypersensitivity reaction

Course : Pharmaceutics V (Physical Pharmacy)) - [C301]	
CO1	To enhance knowledge of micrometrics with respect to determination of particle size, size distribution and packing arrangement.
CO2	Explain different types of surface active agents with regard to structure of micelle and liquid crystal
CO3	Outline in details about interfacial phenomena, electrical properties of interfaces, effect of electrolyte.
CO4	Explain the formulation and manufacture of suspension and emulsion and its evaluation.
CO5	To explore the knowledge of colloidal properties and stability of colloidal systems.

Course : Pharmaceutical medicinal Chemistry I - [C302]	
CO1	Extend the basic principle of medicinal chemistry and relate the stereochemistry, pharmacology, synthesis, structure activity relationship of non steroidal anti-inflammatory drugs, prostaglandin and narcotic drugs
CO2	Illustrate the mechanism of drug metabolisms and summaries medicinal drug of local anasthesis, general anesthesia and sedative-hypnotic drugs
CO3	Explain the concept of prodrug and relate the chemistry of oral hypoglycemic agent and antihisthmatic agent
CO4	Outline the medicinal chemistry of antihistamine drug, anti-alzheimer and antiparkinsonisms drug

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Course : PHARAMCOLOGY III - [C303]	
CO1	Summarize neurotransmitters and transmission. outline etiopathogenesis and treatment of various pathological conditions associated with them.
CO2	Outline pharmacology of drug used in treatment of various pathological condition associated with respiratory system.
CO3	Outline pharmacology of drugs used in the treatment of a various pathological conditions associated with gastrointestinal system.
CO4	Summarize the concept of clinical research.

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY III - [C304]	
CO1	Outline extraction, isolation and purification by chromatographic methods for phytoconstituents.
CO2	Explain terpenoids and volatile oil with respect to classification, general properties and pharmacognostic study of given drugs.
CO3	Outline resins and resin combinations with respect to classification, general properties, biosynthetic pathways and pharmacognostic study of given drugs.
CO4	Illustrate isolation, purification and chromatographic profile of given phytoconstituents.
CO5	Outline structural ellucidation of camphor, eugenol, taxol and artemisinin.

Course : CLINICAL PHARMACY - [C305]	
CO1	Explain the concept of clinical pharmacy practice
CO2	Outline basic concepts and acquire knowledge of toxicology, role of antidote and specific treatment poison.
CO3	Outline the role of clinical pharmacist for minimizing di, adr, and safety of the patient care
CO4	Explain and acquire the knowledge of drug-induced diseases
CO5	Explain the diagnostic test used in the clinical laboratory in different diseases
CO6	Summarize and understand the concept of pharmacoeconomics and the role of computers in clinical pharmacy.

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Course : REGULATORY AFFAIRS SND INTELLECTUAL PROPERTY RIGHT - [C306]	
CO1	Summarize importance and functions of regulatory affairs & strategy used in different phases of product development
CO2	Outline various drug regulatory authorities and agencies worldwide and discussion about their guidelines
CO3	To explore the introduction, format, maintenance requirements and types for filling an applications for inda,anda, and dmf
CO4	Explain intellectual property rights and intellectual property laws in india with patent legislation
CO5	Summarize and understand patent procedure ,filling, search ,licensing with patent infringement issues and laws related to biosimilars

Course : PHARAMCEUTICS V - [P301]	
CO1	To enhance knowledge of micromeritric with respect to the determination of particle size, size distribution and packing arrangement
CO2	Explain different types of surface active agents with regard to structure of micelle and liquid crystal.
CO3	Outline in details about interfacial phenomena, electrical properties of interfaces, effect of electrolyte.
CO4	Explain the formulation and manufacture of suspension and emulsion and its evaluation
CO5	To explore the knowledge of colloidal properties and stability of colloidal systems.

Course : Pharmaceutical medicinal Chemistry I (P) - [P302]	
CO1	Relate the evaluation of pharmacopoeial standards of selected drugs
CO2	Analyse the physiochemical properties of synthesized medicinal compounds.

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Course : PHARMACOLOGY III (Practical) - [P303]	
CO1	Outline the concept of experimental pharmacology, and demonstrate and identify the biological activity of unknown drug samples using basic behavioral pharmacology experimentation model analgesic sedative and hypnotic
CO2	Demonstrate and identify the biological activity of unknown drug sample using basic behavioral pharmacology experimentation model of anxiety, depressant, anticonvulsant and antipyretic activity

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY III (P) - [P304]	
CO1	Outline morphological and microscopical characters of crude drugs.
CO2	To perform the chromatography (TLC, paper chromatography, column chromatography).
CO3	Outline extraction, isolation and estimation of phytoconstituents.
CO4	Outline morphological and chemical test of given crude drugs.

Course : CLINICAL PHARMACY (P) - [P305	
CO1	Outline the various identification test and estimation of normal and abnormal constituents in urine (urine analysis).
CO2	Summarize, understand the concept of adr, adr form available worldwide and preparation of adr report
CO3	Explain the study of prescription, calculation of price

Course : Pharmaceutics VI (Physical Pharmacy) - [C307]	
CO1	Explain the mechanism of solute-solvent interactions, ideal solubility and scatchard – hildebrand equation, phase rule and phase equilibria, solvation and association, distribution of solutes between immiscible liquids.
CO2	Illustrate diffusion, steady-state diffusion, diffusion coefficient, zero-order kinetics, first-order kinetics, hixon crowell and higuchi equations. usp dissolution apparatus and explain the influence of temperature, light, solvent, catalysts and other factors on rate of reaction and accelerated stability studies
CO3	Outline the types of flow behaviour, thixotropic and thixotropic coefficient and interpret measurement of various rheological properties with factors influencing rheology of dispersed systems.
CO	Illustrate the knowledge of complexation to analyse it.
CO5	Apply the knowledge about polymer characteristic to interpret how it as a thickening agent, polymer solution overview and explain its mechanical properties, interchain cohesive forces, crystallinity, tacticity, morphology, orientation glass – rubber transition, plasticization

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Course : Pharmaceutical Medicinal Chemistry II - [C308]	
CO1	Illustrate the structure, classification, mechanisms of action, synthesis and metabolism of antimicrobial agents
CO2	Outline the antibiotics and relate its chemistry
CO3	Illustrate drug design and relate its concept
CO4	Illustrate the concept of combinatorial chemistry and recall genetic engineering

Course : Pharmacology IV - [C309]	
CO1	Explain the concept of hormonal regulation, hormonal disturbances, outline the management in detail through drug therapy.
CO2	Illustrate the mechanism of bacterial, viral and fungal infection with associated diseases and to extend the treatment through antimicrobial drug therapy.
CO3	Outline the process and pharmacotherapy of parasite, helminths infection and cancer and to summarize efficacy of immunomodulators in various pathological conditions.
CO4	Explain the concept of clinical trials, its design, ethics, and role of regulatory authorities extend its utility in clinical research

Course : Pharmacognosy and Phytochemistry IV (Recent Advance in Phytochemistry)) - [C310]	
CO1	Summarize introduction, definition, occurrence, properties, classification, uses, general biogenetic pathways. general extraction and isolation methods and pharmacognostic study of glycosides
CO2	Outline general introduction, classification, properties, uses, chemical tests and general method of extraction and pharmacognostic study of tannins.
CO3	Outline isolation, purification and therapeutic uses of following phytocompound
CO4	Summarize about extraction, isolation, purification and estimation of following phytocompounds
CO5	Outline spectral analysis of following phytocompounds

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Course : Clinical Pharmacotherapeutics I - [C311]	
CO1	Summarize the significance and need for rational of drug use and prepare future pharmacist with good knowledge of drugs and disease and rational prescription.
CO2	Summarize the theory, etiopathogenesis, and pharmacotherapy of diseases /disorders associated with the cardiovascular and hemopoietic system. to help in understanding the management of patients of such diseases.
CO3	Summarize the theory, etiopathogenesis, and pharmacotherapy of diseases /disorders associated with the respiratory system. to help in understanding the management of patients of such diseases.
CO4	Summarize the theory, etiopathogenesis, and pharmacotherapy of diseases /disorders associated with the gastrointestinal system. to help in understanding the management of patients of such diseases.
CO5	Summarize the theory, etiopathogenesis, and pharmacotherapy of diseases /disorders associated with the central nervous system. to help in understanding the management of patients of such diseases.
CO6	Summarize the theory, etiopathogenesis, and pharmacotherapy of diseases /disorders associated with the urogenital and musculoskeletal system. to help in understanding the management of patients of such diseases.

Course : Pharmaceutical Validation - [C312]	
CO1	Explain the concept of pharmaceutical validation processes
CO2	Explain the concept of validation of pharmaceutical dosage form
CO3	Explain the concept of validation of analytical processes

Course : PHARMACEUTICS-VI (PHYSICAL PHARMACY) - [P307]	
CO1	Explain the mechanism of solute solvent interactions, ideal solubility, phase rule and phase equilibria,solvation and association, distribution of solutes between immiscible liquids.
CO2	Outline the influence of temperature, light, solvent, catalysts and other factors on rate of reaction
CO3	Outline types of flow behaviour, measurement of various rheological properties and factors influencing rheology of dispersed systems

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Course : Pharmaceutical medicinal Chemistry II (P) - [P308]	
CO1	Outline the synthesis of selected drugs and relate its physiochemical properties
CO2	Relate the pharmacopoeial assay of selected drugs

Course : Pharmacology IV (P) - [P309]	
CO1	Determine the pKa value of given antagonist and demonstrate ld50 determination and to record BP, ECG, by non-invasive methods.
CO2	Outline and identify the biological activity of unknown drug sample using basic behavioural pharmacology experimentation.

Course : Pharmacognosy and Phytochemistry IV (Recent Advances in Phytochemistry) (P)) - [P310]	
CO1	Select appropriate method for determination of aldehyde and phenol content in crude drug
CO2	Make use of standardized extract in herbal and cosmetic formulation and evaluate them with pharmacopoeial standards
CO3	Apply preliminary screening methods to identify crude drug

Course : Clinical Pharmacotherapeutics I (P) - [P311]	
CO1	Summarize and understand the knowledge of the basic concept of neuromuscular junction and techniques of anesthesia.
CO2	Outline the cns experimental pharmacology
CO3	Explain the study of prescription, calculation of price and drug use for iv infusion

Course : Pharmaceutics(DFT-I) - [C401]	
CO1	Explain the fundamentals of preformulation parameters like physico- chemical properties of drugs and excipients and interpret its application in formulation of stable and effective dosage form.
CO2	Outline the formulation and evaluation aspects of tablet and capsules. relate the processing and coating defects of tablets with manufacturing process and additives used in its formulation.
CO3	Explain the formulation and evaluation aspects of ointments, suppositories and cosmetics. outline the structure and function of skin and hair.
CO4	Summarize the sterile dosage form including its types, formulation, compounding, processing, and manufacturing. explain its quality control tests, different excipients in formulation of svps, lvps and relate it with the stability of product.

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Course : Pharmaceutical Medicinal Chemistry-III - [C402]	
CO1	Illustrate the biosynthesis and metabolisms of adrenergic and cholinergic neurotransmitter and relates its mechanisms of action
CO2	Classify the types of cardiovascular drugs and relate its moa.
CO3	Explain the nomenclature, stereochemistry and metabolisms of steroids and outlines the different classes of endocrine system acting drugs.

Course : Pharmaceutical Analysis-III (Separation Techniques) - [C403]	
CO1	Explain the process and factors involved in separation of compound by solvent extraction and electrophoresis choose the suitable separation technique by make use of its structural information
CO2	Illustrate the process, technique and mechanism of column and ion exchange chromatography and apply the concept for separation of organic and inorganic molecule.
CO3	Illustrate the principle, mechanism and process involved in flat bed chromatography and utilize it for qualitative and quantitative estimation of compound
CO4	Illustrate principle, instrumentation of gc and hplc and interpret suitable model to analyze organic compound

Course : Clinical Pharmacotherapeutics-II - [C404]	
CO1	Outline prescribing guideline for pediatric and geriatric patients
CO2	Explain etiopathogenesis of a pathological condition associated with endocrine system and opthalmology.
CO3	Explain etiopathogenesis of a pathological condition associated with infectious diseases.
CO4	Explain etiopathogenesis of skin and illustrate the basic principle of cancer therapy and chemotherapy, place drug regimen to regulate adr associated with cancer chemotherapy

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Course : Pharmacognosy and Phytochemistry V - [C405]	
CO1	Analyze importance of phytopharmaceuticals and show global opportunities for herbal product
CO2	Explain alkaloidal, flavanoidal containing drug, their method of extraction, isolation, estimation and identify its usuage in formulating phytopharmaceuticals
CO3	Relate and list suitable analytical parameter for standardization and screening method of herbal drugs
CO4	Summarize patenting of herbal drug. classify herb drug interaction and identify possible side effects of herb drug interaction

Course : Biopharmaceutics and Pharmacokinetics - [C406]	
CO1	To outline the aspects of absorption and distribution of drugs and summarize factors affecting it along with kinetics of protein binding.
CO2	To explain metabolic pathways and elimination of drugs and extend various factors affecting it.
CO3	To apply the concept of drug release kinetics to infer bioavailability and bioequivalence
CO4	To interpret compartmental and physiological models of pharmacokinetics and outline the concept of nonlinear pharmacokinetics.

Course : Pharmaceutics (DFT-I) (Conventional) - [P401]	
CO1	Apply the theoretical knowledge of tablet and sterile dosage forms and make use of it in the formulation and evaluation of these dosage forms and evaluation of marketed coated and uncoated tablets.
CO2	Apply the theoretical knowledge of cosmetics and make use of it in the formulation and evaluation of cosmetic dosage forms.

Course : Pharmaceutical Medicinal Chemistry-III(P) - [P402]	
CO1	Relate the pharmacopoeial standards of selected drugs
CO2	Analyse the physiochemical properties of synthesized medicinal compounds.

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Course : Pharmaceutical Analysis-III (Separation Techniques)(P) - [P403]	
CO1	Apply theoretical knowledge to develop paper and thin layer chromatography to identify organic compound
CO2	Compare the effect of mobile phase to interpret resolution of chromatogram and identify the mechanism of separation in column chromatography and ion exchange chromatography
CO3	Demonstrate and compare the working of hplc and gas chromatography

Course : CLINICAL PHARMACOTHERAPEUTICS-II (PRACTICAL) - [P404]	
CO1	Demonstrate the biological activity of given drug sample using basic behavioral pharmacological experimentation.
CO2	Determination of unknown concentration of acetylcholine using multipoint bioassay method.
CO3	Recall the principal of clinical trial and outline principal related patient oriented problem associated with listed pathological conditions.

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY-V (PRACTICAL) - [P405]	
CO1	Make use of morphological microscopical, microhemical/chemical aspects Outline crude drug
CO2	Choose and experiment with different physicochemical parameters of standardization of crude drug
CO3	Utilize suitable method of extraction of tannin and alkaloid

Course : PHARMACEUTICS (DFT-II) NDDS - [C407]	
CO1	Outline the physicochemical and biological factors that relate the design and performance of controlled /sustained release drug delivery systems
CO2	Illustrate the design and fabrication of oral controlled drug delivery systems to infer the mechanism of drug release. explain the anatomy and dynamics of gi tract to develop drug delivery systems to prolong gi retention.
CO3	Illustrate the anatomy and physiology of eye to develop the novel ocular controlled drug delivery systems and devices. explain the fundamentals and rationale of transdermal drug delivery system and make use of it for formulation and evaluation aspects.
CO4	Outline the major routes of parenteral administration with biopharmaceutics of sustained/controlled release parenteral dosage form system and make use of it for formulation.

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Course : PHARMACEUTICAL BIOTECHNOLOGY AND MOLECULAR BIOLOGY - [C408]	
CO1	Recall the basic concept dna and explain the concepts in genetic engineering; to acquaint the versatile tools and techniques employed in genetic engineering and recombinant dna technology.
CO2	Illustrate and explain the concept of plant tissue culture techniques and their application in biotechnology. summarize the knowledge of transgenic plants as well as industrial and agricultural applications of plant biotechnology.
CO3	Explain how to maintain cultures of animal cells and established cell lines with good viability, minimal contamination and appropriate documentation.
CO4	Illustrate enzyme immobilization and fermentation. find the application of enzyme immobilization and fermentation in industry. explain the concept of isolation of fermentation product and method of enzyme immobilization.

Course : PHARMACEUTICAL ANALYSIS-IV (SPECTROSCOPY) - [C409]	
CO1	Interpret auxochromic chromophoric group from organic molecule and illustrate the components of uv spectrophotometer and summarize its quantitative and qualitative application.
CO2	Explain principle and working of ir and atomic absorption and emission spectrophotometer. identify, relate various functional groups and ions from given spectrum.
CO3	Illustrate the various ion source and analyser in mass spectrometer. apply the concept of fragmentation pattern to interpret structure of organic molecule
CO4	Explain principle and instrumentation of nmr. contrast the nature of proton by make use of nmr spectrum

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY-VI (INDUSTRIAL PHARMACOGNOSY) - [C410]	
CO1	Recall herbal drug regulation of india and relate with present scenario of trade in india
CO2	Explain ayurvedic dosage form, traditional plant drugs and herbal cosmetics, infer its use in ayurvedic formulation, cosmetic formulation
CO3	Select various quality control parameter of herbal production and relate with good manufacturing practice for herbal production
CO4	Classify neutraceutical, marine drugs and relate its use in disease conditions

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Course : PHARMACOVIGILANCE (DRUG SAFETY) - [C411]	
CO1	Show development of pharmacovigilance in india and explain various legislation regulations enacted
CO2	Identify and make use of various pharmacovigilance method Outline different populations as well as special cases that fall under pharmacovigilance purview
CO3	Illustrate, classify adr and relate adr with casuality assessment and meddra
CO4	Summarize drug safety of biopharmaceutical, biosimilar and infer signal detection

Course : INDUSTRIAL PHARMACY - [C412]	
CO1	Summerize scale-up techniques for solid dosage form, injections, semisolids and ophthalmic products and relate its significance for large scale setup. interpret formulation aspects and evaluation of pellets.
CO2	Explain the formulation aspects of microencapsulation and aerosols. identify the critical attributes of their formulation and evaluation
CO3	Explain the optimization techniques and utilize it in stabilizing pharmaceutical formulation. Classify different types of packaging materials and make use of it in its selection as per the requirement of dosage form.
CO4	Explain cgmp guidelines. to summarize chemical and pharmaceutical safety and hazards and to make use of cgmp guidelines and safety management for industrial application

Course : PHARMACEUTICS (DFT-II) NDDS (PRACTICAL) - [P407]	
CO1	Identify the water uptake capacity of swellable polymer in matrix tablet, the effect of temperature and ph on rheological and swelling properties of different polymers to make use of it in formulation of novel drug delivery systems.
CO2	Choose different techniques for preparations of dosage forms such as microspheres, granules and beads and to identify its evaluation parameters.

Course : PHARMACEUTICAL BIOTECHNOLOGY AND MOLECULAR BIOLOGY (PRACTICAL) - [P408]	
CO1	Identify the unknown concentration of protein with standard curve using different method.
CO2	Demonstrate and identify isolated dna from plant, fermentation product. determine immobilization of enzyme by entrapment in gel.

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Course : PHARMACEUTICAL ANALYSIS-IV (SPECTROSCOPY)(PRACTICAL) - [P409]	
CO1	Plan the experiment to demonstrate beer's lambert law, effect of ph, solvent by uv spectrophotometry.
CO2	Experiment with uv spectroscopy and compute unknown concentration of given drug sample.
CO3	Demonstrate the working of ir, aas to identify unknown group of the compound.

Course : PHARMACOGNOSY AND PHYTOCHEMISTRY-VI (INDUSTRIAL PHARMACOGNOSY) (PRACTICAL) - [P410]	
CO1	Make use of traditional plant drug in herbal formulation and analyse them using physicochemical parameter
CO2	Apply chromatographic and extraction technique to identify and study crude drugs

Course : PROJECT - [P413]	
CO1	Apply the theoretical knowledge to identify the thirst area of research/review
CO2	Apply appropriate methodology for a given problem and analyze set of results. conclude the project and summarize its outcome

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