Gurunanak College of Pharmacy, Nari,Nagpur - 440026

B. Pharmacy

#	Type	ID	Program Outcome
1	PSO	PO1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
2	PO	PO2	Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
3	PSO	PO3	Problem analysis: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
4	PSO	PO4	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
5	PO	PO5	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well- being.
6	PO	PO6	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
7	PO	PO7	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
8	PSO	PO8	Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
9	PO	PO9	The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
10	PO	PO10	Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
11	PO	PO11	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self- assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

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Subjectwise Course Outcome - [B. Pharmacy - 2020-21]

FY-FIRST SEMESTER	
- BP101T Human Anatomy and Physiology -I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Explain the relevance and significance of Human Anatomy and Physiology to Pharmaceutical Sciences.
CO-2	Explain basic terminologies used in anatomy and physiology as well as prefixes & suffixes used to identify body parts and directional terms.
CO-3	Describe the various homeostatic mechanisms and their imbalances.
CO-4	Identify the various tissues and organs of different systems of human body.
CO-5	Explain the gross morphology, structure and functions of various organs of the human body.
BP102T Pharmaceutical Analysis- I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the fundamental concept of pharmaceutical analysis
CO2	Learn methods to prepare different strengths of solutions
CO3	Understand sources of errors
CO4	Learn the fundamentals of volumetric analytical skills
CO5	Understand principles of volumetric and electro-chemical titrations
BP103T Pharmaceutics -I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To know the history of profession of pharmacy.
CO2	To understand the basics off different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations.
CO3	To understand the professional way of handling the prescriptions.
CO4	Preparation of various conventional dosage forms.
Pharmaceutical Inorganic Chemistry [Theory | Regular]	
CO ID.	**Course Outcome**
PIC.CO1	Know the sources of impurities
PIC.CO2	Know the methods to determine the impurities in inorganic drugs and pharmaceuticals
PIC.CO3	Understand the medicinal and pharmaceutical importance of inorganic compounds
Communication skills [Theory | Regular]	
CO ID.	**Course Outcome**
Course outcome not yet added by the respective faculty.(No faculty assigned.)	
Remedial Biology/Remedial Mathematics [Theory | Regular]	
CO ID.	**Course Outcome**
C01	Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.

CO2	Create, use and analyze mathematical representations and mathematical relationships
C03	Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy
BP107P Human Anatomy and Physiology [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	. Explain the construction, working, care and handling of various instruments, glassware and equipment required for conducting the practical.
CO2	Demonstrate the simple laboratory techniques.
CO3	Identification of different types of bones and their placements in body
CO4	ability to perform the hematological determinations
CO 5	Explain the precautions taken by student while doing the practical in the laboratory.
Pharmaceutical Analysis I [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the fundamental concept of pharmaceutical analysis
CO2	Learn methods to prepare different strengths of solutions
CO3	Understand sources of errors
CO4	Learn the fundamentals of volumetric analytical skills
CO5	Understand principles of volumetric and electro-chemical titrations
Pharmaceutics I [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Formulation of various liquid pharmaceutical dosage forms.
CO2	Fofrmulation and preparation of semisolid dosage forms.
CO3	Formulation and preparation of solid dosage forms.
CO4	Design proper labels for the prepared formulations
Pharmaceutical Inorganic Chemistry [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Perform the limit tests of impurities
CO2	Identify inorganic compounds
CO3	Perform tests for purity of pharmaceuticals
CO4	Synthesize inorganic compounds
Communication Skills [Practical | Regular]	
CO ID.	**Course Outcome**
Course outcome not yet added by the respective faculty.(No faculty assigned.)	
BP112RBP Remedial Biology [Practical | Regular]	
CO ID.	**Course Outcome**
Course outcome not yet added by the respective faculty.(Dr. Shekhar Waikar)	
SY-THIRD SEMESTER	
BP301T Pharmaceutical Organic Chemistry II [Theory | Regular]	
CO ID.	**Course Outcome**

CO1	Explain basic knowledge regarding general method of preparation of organic compounds.
CO2	Summarize reactions of organic compounds including synthesis, mechanism, orientation & reactivity.
CO3	Illustrate knowledge of organic compounds in synthesis of some drugs.
CO4	Explain chemistry of fats & oils.
CO5	Differentiate polynuclear organic compounds with respect to their chemistry.
CO6	Structure and uses of important organic compounds.

Physical Pharmaceutics I [Theory | Regular]

CO ID.	Course Outcome
CO1	Define and remember various physico-chemical properties (partition coefficient, solubility, Rf etc) of drug molecules, drug Protein complexation, pH buffers and Surface tension of liquids used in the pharmaceutical formulations.
CO4	Identify and interpret the physico-chemical properties, pH-buffers, factors affecting surface tension and complexation properties of drug molecules in the pharmaceutical application.
CO3	Understand the concept of Raults law, surface tension and HLB and apply them in pharmaceutical practices.
CO2	Describe the role of distribution law, diffusion, surfactants, interfacial phenomenon, pharmaceutical buffers, tonicity and concept of complexation.

Pharmaceutical Microbiology [Theory | Regular]

CO ID.	Course Outcome
CO-1	Know about new world of microorganisms and understand methods of identification, cultivation and preservation of them.
CO-2	Understand the importance, various methods and application of sterilization inpharmaceutical products and industry.
CO-3	Demonstrate theory and practical skills in microscopy and handling of compound microscope and staining procedures
CO-4	Understand and apply the knowledge about aseptic area, sterilization equipment and clean room in pharmaceutical industry
CO-5	Demonstrate and learn about various techniques of sterility testing, microbial assay, preservation of pharmaceutical products and cell culture.

Pharmaceutical Engineering [Theory | Regular]

CO ID.	Course Outcome
CO1	To know various unit operations used in Pharmaceutical industries.
CO2	To understand the material handling techniques.
CO3	To perform various processes involved in the pharmaceutical manufacturing process.
CO4	To carry out various tests to prevent environmental pollution.
CO5	To appreciate and comprehend the significance of plant layout design for optimum use of resources.
CO6	To appreciate the various preventive methods used for corrosion control inPharmaceutical industries.

BP305P Pharmaceutical Organic Chemistry II [Practical | Regular]

CO ID.	Course Outcome
CO1	How to perform laboratory work in safe & tidy manner.
CO2	How to purify and separate an organic compound by way of seam distillation, recrystallization techniques.
CO3	How to identify the purity of fats and oils by acid value, saponification value and iodine value (including standardization of reagents)..
CO4	How to perform synthesis of organic compounds using diazotization, oxidation reactions and EAS reactions like nitration, halogenation etc.
CO5	How to analyze named reactions like perkin and claisen schmidt reactions by using carbonyl compounds.

Physical Pharmaceutics I [Practical | Regular]

CO ID.	Course Outcome
CO1	To determine the various properties like solubility, partition coefficient, pKa of the drug.
CO2	To compare the surface tension determined by drop number and drop count methods.
CO3	To correlate the effect of different factors on surface tension, partition coefficient and CMC value
CO4	Demonstrate the procedural parts of practicals
BP203 T Pharmaceutical Microbiology [Practical | Regular]	
CO ID.	**Course Outcome**
COP-1	Know about various instruments and equipment, their working and uses, used in pharmaceutical microbiology laboratory.
COP-2	Demonstrate practical skills in fundamental microbiological techniques like media preparation, subculturing, streaking staining etc.
COP-3	Learn various methods of sterilization used for different type of materials, surfaces and environment.
COP-4	Perform specialized methods for their isolation, detection, observation and identification of microorganisms in various samples.
COP-5	Acquire and apply the theories and principles of microbiology in practical, professional life, real-world situations and problems.
Pharmaceutical Engineering [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Operate various equipment used in unit operations such as ball mill, sieve-shaker, hot air oven etc.
CO2	Study effect of various parameters affecting unit operations like filtration and evaporation.
CO3	Understand the importance of various unit operations by using various instruments
CO4	Determination of various constants, values used in various unit operations
TY-FIFTH SEMESTER	
Medicinal Chemistry II [Theory | Regular]	
CO ID.	**Course Outcome**
CO1.	Understand the chemistry of drugs with respect to their pharmacological activity.
CO2	Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.
CO3	Know the Structural Activity Relationship of different class of drugs.
CO4	Study the chemical synthesis of selected drugs.
BP502T Industrial Pharmacy I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Relate the physicochemical properties of drugs to dosage form characteristics
CO2	Propose the formulations of specific drugs in various dosage forms and select ingredients according to their types
CO3	Create a new formula for preparation of dosage form and make use of different equipments for solid,liquid,semisolid and parenteral dosage form
CO4	Prepare and evaluate different dosage forms and perform quality control tests
CO5	Prepare and evaluate injections,eye drops and eye ointments
CO6	Select suitable packaging container for a dosage form and evaluate them
BP503. T. Pharmacology II [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the mechanism of action of drug action from different class and categories.
CO2	Know drug relevance in the treatment of various diseases and disorders

CO2	Know drug relevance in the treatment of various diseases and disorders.
CO3	Understand the clinical uses and adverse effects and contraindications of drugs acting on varoius systems of the body.
CO4	Understand basic concept of bioassay.
CO5	Appreciate correlation of pharmacology with related medical sciences.

BP504 T Pharmacognosy and Phytochemistry II [Theory | Regular]

CO ID.	Course Outcome
CO1	Explain the metabolic pathways leading to biosynthesis of various classes of natural products
CO2	Critically assess the utilization of radioactive isotopes in the investigation of biosynthetic pathways
CO3	Describe the source, chemistry, therapeutic uses of various secondary metabolites containing drugs.
CO4	Demonstrate the methods of isolation, identification and analysis of various phytoconstituents
CO5	Describe the methods for industrial production, estimation and utilization of some therapeutically important phytoconstituents
CO6	Learn about modern extraction technique, characterization and identification of the herbal drug and phytoconstituents
CO7	Understand the utility of latest techniques for analysis of phytoconstituents

Pharmaceutical Jurisprudence [Theory | Regular]

CO ID.	Course Outcome
CO1	To understand the Pharmaceutical legislations and their implications in the development and marketing
CO2	Describe the various indian pharmaceutical acts and laws
CO3	To study about the various regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
CO4	To understand the code of ethics during the pharmaceutical practice.

BP506P Industrial Pharmacy I [Practical | Regular]

CO ID.	Course Outcome
CO1	Prepare formulations of different dosage forms as per the formula and select ingredients according to type of Tablets
CO2	Select suitable packaging container for a dosage form
CO3	Relate the physicochemical properties of drugs to dosage form characteristics
CO4	Evaluate different dosage forms by performing quality control tests
CO5	Create a new formula for preparation of dosage form and make use of different equipments
CO6	Prepare and evaluate Injections
CO7	Prepare cold cream and Vanishing cream

Pharmacology II [Practical | Regular]

CO ID.	Course Outcome
CO1	Know in-vitro pharmacology and various physiological salt solutions.
CO2	Demonstrate isolation of different organs/tissues from the laboratory animals by computer simulation experiments.
CO3	Demonstrate the various receptor actions using isolated tissue preparation.
CO4	Know screening techniques of drugs from category of NSAIDs.
CO5	Know the effects of ions and drugs on isolated tissue/organ preparation.

BP 508 P Pharmacognosy and Phytochemistry II [Practical | Regular]

CO ID.	Course Outcome
CO1	Remember the morphological and microscopical characteristics of Crude Drugs

CO2	Create method for isolation of phytoconstituents from crude drugs
CO3	Analysis of isolated phytoconstituents from crude drugs
CO4	Demonstrate and understand the Concept of Paper and Thin Layer Chromatography of Herbal Extracts
CO5	Understand the principle involved in Isolation and analysis of volatile oils
CO6	Implement different chemical tests for the identification of unorganized crude drugs
FINAL YEAR-SEVENTH SEMESTER	
BP Instrumental Methods of Analysis [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	1. Understand the chromatographic separation and analysis of drug.
CO2	Perform quantitative and qualitative analysis of drugs using chromatographic techniques.
CO3	Perform qualitative and quantitative analysis of substances using chromatographic instruments.
CO4	To understand the interaction of matters with electromagnetic radiations and its application in drug analysis.
Industrial Pharmacy II [Theory | Regular]	
CO ID.	**Course Outcome**
IP.CO1	Know the process of pilot plant and scale up of pharmaceutical dosage forms
IP.CO2	Understand the process of technology transfer from lab scale to commercial batch
IP.CO3	Know different Laws and Acts that regulate pharmaceutical industry
IP.CO4	Understand the approval process and regulatory requirements for drug products
Pharmacy Practice [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To understand the elements of hospital and hospital pharmacy
CO2	To know various drug distribution methods in a hospital
CO3	To grasp the significance of pharmaceutical services, clinical services and patient care services
CO4	To understand the community pharmacy management and inventory control
CO5	To provide integrated, critically analysed drug and poison information to enable healthcare professionals in the efficient patient management
CO6	To Interpret the laboratory results to aid the clinical diagnosis of various disorders
BP 704T Novel Drug Delivery System [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Upon completion of NDDS course, students shall be able to understand various approaches for development of novel drug delivery systems
CO2	Upon completion of NDDS course, students shall be able to To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation
CO3	Upon completion of NDDS course, students shall be able to correlate various factors influencing formulation and development of novel drug delivery systems.
CO4	The students will be able to apply strategies in selecting physical form of the formulation, formulation technologies and evaluation tests.
BP705P Instrumental Methods of Analysis [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	identification and separation of compounds by chromatography

CO1	Identification and separation of compounds by chromatography
CO2	Separation and purification of compounds by different chromatographic techniques
CO3	understand the interaction of matter with electromagnetic radiations and its application in drug analysis
CO4	understand the chromatographic separation and analysis of drug
CO5	Perform quantitative and qualitative analysis of drugs using various analytical instruments
---------- **Pharma Marketing Management (Practice School) [Theory | Regular]**	
CO ID.	**Course Outcome**
CO1	Understand the fundamental concept and scope of marketing.
CO2	To understand and link the marketing concepts to the pharmaceutical market and analyse its dyanamics.
CO3	To study and understand the concepts of product decision and pricing in the process of market research and compare them with the pharmaceutical market.
CO4	To understand the techniques of product promotion and analyse their utilities in the pharmaceutical market.
BP706PS Cosmetic Science (Practice School) [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Gain updated information on cosmetic science; properties of the skin, hair and nails and the cosmetic products and ingredients that may actively affect these properties.
CO2	Apply information gained to make cosmetic formulations correctly and effectively for probable commercial use
CO3	Recognize the ingredient(s) that can be effective or problematic for an individual with specific needs or complaint.
CO4	Make comparisons between the cosmetic products and evaluate their suitability for a particular need.
CO5	Critically review, analyse, and evaluate scientific data and basic research in cosmetic science.
Quality Control and Standardization of Herbals (Practice School) [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Define various terminologies like biological markers, chemical markers, medicinal plant materials, pharmaceutical substances.
CO2	Elaborate the various component parts of GMP, GLP, GAP in traditional system of medicine.
CO3	Explain the various parameters used in the evaluation of herbal drugs as per WHO guidelines, EU and ICH guidelines.
CO4	Classify various chromatographic techniques used in the standardization of herbal products.
CO5	Explain the role of chemical and biological markers in the standardization of herbal products.
Diagnostic Tools (Practice School) [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the importance of Immobilized enzymes in Diagnosis
CO2	Genetic engineering applications in Diagnosis
CO3	Understand the importance of Monoclonal antibodies in Diagnosis
CO4	Appreciate the mechanism of working of various diagnostic tools
Experimental Pharmacology (Practice School) [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the applications of various commonly used laboratory animals, their handling and legal requirement
CO2	Demonstrate the common laboratory techniques like dissection, blood withdrawal, Breeding techniques, Surgical techniques
CO3	Design and execute a preclinical experiment

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Subjectwise Course Outcome - [B. Pharmacy - 2020-21]

FY-SECOND SEMESTER	
201T Human Anatomy and Physiology II [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Explain the gross morphology, structure and functions of various organs of thehuman body.
CO2	Describe the various homeostatic mechanisms and their imbalances.
CO3	Identify the various tissues and organs of different systems of the human body.
CO4	Appreciate coordinated working pattern of different organs of each system
CO5	Appreciate the interlinked mechanisms in the maintenance of normal functioning(homeostasis) of human body.
Biochemistry [Theory | Regular]	
CO ID.	**Course Outcome**
CO-1Biochem	Learn about various biochemical reactions occurring in human body and how they are helpful in metabolism.
CO-2Biochem	Know about various biomolecules in human body playing important role in various biochemical reactions.
CO-3Biochem	Understand the metabolism of nutrient molecules and other biomolecules in physiological and pathological conditions.
CO-4Biochem	Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
CO-5Biochem	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
Pharmaceutical Organic Chemistry I [Theory | Regular]	
CO ID.	**Course Outcome**
CO 1	To write the structure, name and the type of isomerism of the organic compound
CO 2	To write the reaction, name the reaction and orientation of reactions
CO 3	account for reactivity/stability of compounds,
CO 4	identify/confirm the identification of organic compound
Pathophysiology [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Describe etiology and pathogenesis of the selected disease states.
CO2	Name the signs and symptoms of the disease.
CO3	To understand the body's immune responses .
CO4	Describe the healing and recuperation in a human body.
Envoirnmental Sciences [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Create 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 learners 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.
207P Human Anatomy and Physiology II [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Perform the hematological tests like blood cell counts, haemoglobin estimation,bleeding/clotting time etc and also record blood pressure, heart rate, pulse andrespiratory volume.
CO2	Perform the hematological tests and also record blood pressure, heart rate, pulse andrespiratory volume.
CO3	ability to identify different organs and their locations in the body
CO4	To demonstrate the general neurological examination
Biochemistry [Practical | Regular]	
CO ID.	**Course Outcome**
COP-1Biochem	Understand and perform qualitative analysis of carbohydrates and proteins.
COP-2Biochem	Understand and perform quantitative analysis of sugars and proteins
COP-3Biochem	Know about abnormal constituents of urine and perform qualitative analysis of them.
COP-4Biochem	Learn to perform quantitative estimation of blood creatinine, blood sugar and serum total cholesterol.
COP-5Biochem	Learn about enzyme action and effect of temperature and substrate concentration on it.
COP-6Biochem	Know about buffer, its action and preparation
BP208P Pharmaceutical Organic Chemistry I [Practical | Regular]	
CO ID.	**Course Outcome**
CO 1	To know how to carryout the systematic qualitative analysis of unknown organic compounds
CO 2	To learn about the preparation of suitable solid derivatives from organic compounds
CO 3	To understand how to construct the molecular models
Computer Applications in Pharmacy [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Design an MS WORD document
CO2	Create a HTML webpage
CO3	Create database in MS Access
BP205T Computer Applications in Pharmacy [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	After completing this course, students will be able to - Know the various types of application of computers in pharmacy
CO2	After completing this course, students will - Know the various types of databases and understand ways to use them.
CO3	Understand introduction programming languages, use of databases in pharmacy

SY-FOURTH SEMESTER	
Computer Applications in Pharmacy [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Design an MS WORD document
CO2	Create a HTML webpage
CO3	Create database in MS Access
BP401T Pharmaceutical Organic Chemistry III [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	understand the method of preparation of organic compounds
CO2	understand the properties of organic compounds
CO3	explain the stereo chemical aspects of organic compounds
CO4	explain the stereo chemical reactions of organic compounds
CO5	know the medicinal uses of organic compounds
CO6	know the application of organic compounds
BP402T Medicinal Chemistry I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Explain introduction, history, development and the various physiochemical properties and drug metabolism in relation to biological activity
CO2	Explain SAR of some important drug classes and mode of action, uses and side effects at molecular level.
CO3	Summarise synthesis of the important class of compounds.
CO4	Explain drugs acting on the adrenergic nervous system and cholinergic nervous system.
CO5	Discuss the drugs acting as CNS depressants: Anticonvulsants, Antipsychotics, Sedatives & Hypnotics.
CO6	Describe drugs acting on CNS: General Anaesthetics, Narcotic and Non-Narcotic analgesics and Narcotic antagonists & anti-inflammatory agents.
Physical Pharmaceutics II [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand and explain the properties and principles of dispersed systems, rheology and micromeretics.
CO2	Describe the fundamental and derived properties of powders and their applications in the formulation design.
CO3	Identify and interpret (theoretical) rheological, micromeritics and dispersion factors to be consider for pharmaceutical dosage form design.
CO4	Outline the reaction kinetics, rate, order and factors affecting the rate of reaction; prevent degradation, stabilization of drugs and shelf-life assessment and to describe the reaction kinetics of dosage forms.
Pharmacology I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Describe the basics of general pharmacology and concepts of pharmacokinetics, pharmacodynamics, adverse drug reaction and drug interactions
CO2	Explain the process by which new drugs are discovered, developed and clinically evaluated
CO3	Understand the pharmacological actions along with adverse effects, drug interaction, contraindication and therapeutic uses of drugs acting on autonomic nervous system and Central nervous system
CO4	Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels

CO5	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
BP405T Pharmacognosy and Phytochemistry I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Demonstrate knowledge of basic concept in the principle of Pharmacognosy and classification of crude drug.
CO3	List the factors affecting cultivation and the methods used for collection and preparation of crude drug for the market.
CO2	Apply the knowledge of evaluation techniques for the quality control of herbal drugs
CO5	Explain various alternative and complementary system of Medicine.
CO6	Categorize the different types of secondary metabolites
CO7	Understand and remember the Biological sources, chemical nature and uses of drugs of natural origin
CO4	Apply the knowledge of Plant Tissue Culture techniques in the field of Pharmacognosy
BP406P Medicinal Chemistry I [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	To perform preparation, understand reaction mechanisms and purification by recrystallization of drugs or intermediates.
CO2	To perform assay on drugs.
CO3	To find out partition coefficient and dissociation constant of organic and medicinal compounds.
Physical Pharmaceutics II [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Demonstrate the procedural part involved in the determination of fundamental properties of powder, rheological properties of liquid and rate of reaction in stability studies.
CO2	To know the concept of accelerated stability studies.
CO3	Evaluate and interpret the effect of various suspending agents and lubricants effect on sedimentation parameters, viscosity of formulation and flow properties of powder respectively.
Pharmacology I [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Understand different laboratory animals & different instruments used in experimental pharmacology
CO2	Demonstrate the common laboratory techniques like dissection, blood withdrawal, anaesthesia and euthanasia
CO3	Evaluate drugs for their activity in experimental animals using different sophisticated instruments
CO4	Observe the effect of drugs on animals by simulated experiments by software and videos
BP408 P Pharmacognosy and Phytochemistry I [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Implement different chemical tests for the identification of unorganized crude drugs
CO2	Explain the significance of quantitative microscopy with respect to leaf constants and lycopodium spore method
CO3	Perform linear measurements for crude drug identification
CO4	Evaluate different quality control parameters for standardization of herbal drugs
TY-SIXTH SEMESTER	
BP601T Medicinal Chemistry III [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the importance of drug design and different techniques of drug design

CO2	understand the chemistry of drugs with respect to biological activity
CO3	Know the metabolism, adverse effects and therapeutic value of drugs
CO4	Know the importance of SAR of drugs
BP602T Pharmacology III [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Imparts basic knowledge of pharmacodynamic of various drugs
CO2	Understand the mechanism of drug action and its relevance in the treatment ofdifferent infectious diseases.
CO3	Basic principles of toxicology and treatment of various poisonings.
CO4	Know correlation of pharmacology with related medical sciences.
CO5	Know basics of Immunopharmacology and Chronopharmacology.
Herbal Drug Technology [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Define various terminologies like herbal medicines, organic farming, biopesticides,neutraceuticals,asavas, arishtas, churnas,bhasma,patents
CO2	Classify neutraceuticals, herbal cosmetics,Ayurvedic dosage forms, herbal exipients, herbal formulations, biopesticides, herb-drug interactions
CO3	Elaborate various component parts of GMP for the production of phytomedicines.
CO4	Explain the role of herbal raw materials and herbal extracts in various herbal cosmetics.
CO5	Explain the role of various phytoconstituents present in traditional plant drugs used in herbal formulations.
BP604T Biopharmaceutics and Pharmacokinetics [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand and Define the basic concepts in biopharmaceutics and pharmacokinetics
CO2	Select the correct pharmacokinetic model based on plasma level or urinary excretion data that best describes the process of drug absorption, distribution, metabolism and elimination (ADME)
CO3	Determine the effect of Pharmacokinetic (ADME) parameters on the biological effects of the drug
CO4	Carry out biopharmaceutical studies and use data so obtained in the development of new drugs or dosage forms
CO5	Calculate various pharmacokinetic parameters from plasma and urinary excretion data applying compartment modeling and model independent methods
CO6	Apply the various regulations related to developing BA -BE study protocol for the new drug molecule and Design Bioavailability and Bioequivalence studies of new drugs or dosage forms
CO7	Evaluate drug-protein binding as a tool to predict pharmacokinetics of drugs
Pharmaceutical Biotechnology [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the importance of Immobilized enzymes in Pharmaceutical Industries
CO2	Genetic engineering applications in relation to production of pharmaceuticals
CO3	Understand the importance of Monoclonal antibodies in Industries
CO4	Appreciate the use of microorganisms in fermentation technology
BP606T Quality Assurance [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Upon completion of this course, students will be able to - Understand the cGMP aspects in a pharmaceutical industry

CO2	Upon completion of this course, students will be able to - Understand various regulatory guidelines to comply with and importance of documentation
CO3	Upon completion of this course, students will be able to - understand the scope of quality certifications applicable to pharmaceutical industries
CO4	Upon completion of this course, students will be able to - understand the responsibilities of Quality Assurance & Quality Control departments
CO5	After this course completion, students will be able to - Apply regulatory rules in pharmaceutical labs and industries
Medicinal Chemistry III [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	To perform preparation, understand reaction mechanisms and purification by recrystallization of drugs or intermediates.
CO2	To perform assay on drugs.
CO3	To find out partition coefficient and dissociation constant of organic and medicinal compounds.
BP 608 P Pharmacology III [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	calculate dose of drugs in pharmacological experiments.
CO2	Learn screening techniques for drugs acting on gastric motility, antiulcer activity, antidiabetic activity, antiallergic activity.
CO3	learn standard procedures for various serum parameter estimation.
CO4	Know the oral acute toxicity study, skin irritation study, eye irritation study.
CO5	Know Bio statistical methods in experimental pharmacology.
Herbal Drug Technology [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Determine the alcohol contents of Asavas and Arishtas
CO2	Apply the knowledge of thin layer chromatography(TLC) to analyse the herbal extracts of ritha, shikakai,clove, kalmegh, bramhi qualitatively with respect to quality and purity.
CO3	Develop the qualitative fingerprint profile of clove oil, eucalyptus oil and peppermint oil.
CO4	Explain the procedure for the estimation/determination of total alkaloids of the crude drugs such as cinchona bark.
CO5	Formulate and evaluate the various herbal cosmetics like creams, lotions and shampoos and herbal dosage forms like syrups, tablets and mixtures.
FINAL YEAR EIGHTH SEMESTER	
Biostatistics and Research Methodology [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Know the operation of M.S. Excel, SPSS, R and MINITAB
CO2	Know the various statistical techniques to solve statistical problems
CO3	Appreciate statistical techniques in solving the problems.
CO4	Know online software used in clinical trials
Social and Preventive Pharmacy [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	After the successful completion of this course, the student shall be able to:Acquire high consciousness/realization of current issues related to health andpharmaceutical problems within the country and worldwide.
CO2	To have a critical way of thinking based on current healthcare development.

CO3	Evaluate alternative ways of solving problems related to health andpharmaceutical issues
BP809ET Cosmetic Science [Theory | Elective]	
CO ID.	**Course Outcome**
CO1	Classify and define Cosmetics and Cosmeceuticals as per Indian and EU regulations
CO2	Describe the role of cosmetic excipients and building blocks in the formulation of cosmetics
CO3	Explain the structure and function of the skin, hair, teeth and gums
CO4	Describe the fundamentals of sun protection and the formulation of Sunscreens, antiperspirants and deodorants
CO5	Design, Formulate and Evaluate cosmetics and cosmeceuticals (synthetic and herbal) for skin care and hair care as well as dental and oral care
CO6	Design cosmetics and cosmeceuticals that address the problems of dry skin, acne, dermatitis, prickly heat, wrinkles, blemishes, hair fall, Dandruff, body odour, bleeding gums, mouth odour, teeth discoloration and sensitive teeth.
BP813PW Project Work [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Identify the problems associated with skin care,hair care and body care. Discover the problems associated with existing formulations .
CO2	Take part in carrying out research and make use of published literature and patents
CO3	Justify the project topic, Compile or create,design or plan for a suitable formulation,its evaluation and interpret ,discuss results and draw conclusion
CO4	Perceive alternatives to problem , make use of herbal and synthetic drugs and additives and improve critic skill,presentation and communication . Assess the commercial importance of new drug product
BP803ET Pharmaceutical Marketing [Theory | Elective]	
CO ID.	**Course Outcome**
CO1	To understand the marketing concepts.
CO2	To understand the techniques and applications of marketing concepts in pharmaceutical industry.
CO3	To find out and understand the various emerging concepts in marketing.
CO4	To study about the promotion methods and the role of sales representatives in functioning marketing channels.
Quality Control and Standardization of Herbals [Theory | Elective]	
CO ID.	**Course Outcome**
CO1	Define various terminologies like biological markers, chemical markers, medicinal plant materials, pharmaceutical substances.
CO2	Elaborate the various component parts of GMP, GLP, GAP in traditional system of medicine.
CO3	Explain the various parameters used in the evaluation of herbal drugs as per WHO guidelines, EU and ICH guidelines.
CO4	Classify various chromatographic techniques used in the standardization of herbal products.
CO5	Explain the role of chemical and biological markers in the standardization of herbal products.

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Subjectwise Course Outcome - [Pharmaceutics - 2020-21]

FY-FIRST SEMESTER	
MPH 101T Modern Pharmaceutical Analytical Techniques [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To understand Analytical techniques for identification, characterization and quantification of drugs
CO2	To learn theoretical and practical skills of instrument handling and use.
CO3	To perform structural Elucidation of organic compounds using spectroscopic tools
MPH102T Drug Delivery Systems [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Define and distinguish between conventional and SR/CR formulations
CO2	Demonstrate the mechanism of drug delivery from SR/CR formulation and use of polymers in designing of drug delivery system
CO3	Select suitable drug candidates for designing Gastro-retentive,buccal,transdermal drug delivery systems
CO4	Identify barriers for drug delivery through Ocular, transdermal and buccal route
CO5	Choose suitable formulation approach for overcoming barriers of various routes of drug administration.
CO6	Demonstrate the importance of proteins and peptide therapeutics and to summarize the mechanism of uptake of antigens by Mucosa Associated Lymphoid Tissues (MALT).
Modern Pharmaceutics [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the elements of pre-formulation studies
CO2	The Active Pharmaceutical Ingredient and Generic drug development
CO3	Know industrial management and GMP considerations
CO4	Understand the concept of Optimization techniques and apply those for the preparation of pharmaceutical formulations
CO5	Understand physics of tablet compression and know various consolidation parameters for tablets
MPH104T Regulatory Affair [Theory | Regular]	
CO ID.	**Course Outcome**
C01	Understand the approval process and regulatory requirements for drugs & cosmetics, medical devices, biological & herbals, and food & nutraceuticals
C02	Summarize the Concepts of innovator and generic drugs, drug development process
C03	Explain The Regulatory guidance's and guidelines for filing and approval process.
C04	Preparation of Dossiers and their submission to regulatory agencies in different countries
C05	Categorize the guidelines for drug testing in animals
Pharmaceutics Practical -I [Practical | Regular]	
CO	**Course Outcome**

ID.	
CO-1	Perform in-process and finished product quality control tests for tablets, capsules, parenteral and semisolid dosage forms
CO-2	Estimation of drug in pharmaceutical by using modern analytical techniques
CO-4	Perform pre formulation study for successful formulation of pharmaceuticals
CO3	Formulate and evaluate various sustained release dosage forms.
CO5	Know the effect of micromeritic properties, compressional force, particle size on tablet dissolution as well as disintegration.
Seminar/ Assignment [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Creat presentation using proper format.
CO2	Prepare presentation on the given topic and deliver the contents effectively
CO3	Use effectively audio-visual aids.
CO4	Choose proper format of presentation.
CO5	Use relevant references and apply proper referencing style.
CO6	Defend and answer questions asked during seminar.
CO7	Deliver relevant and useful matter to complete presentation in a stipulated time period.
FINAL YEAR-III SEMESTER	
Research Methodology and Biostatics [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Discuss different methodologies and techniques used in research work.
CO2	Explain basic computer skills necessary for the conduct of research.
CO3	Describe the appropriate statistical methods required for a particular research design
CO4	Develop a appropriate framework for research studies
Journal Club [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Prioritize useful resources among a multitude of publications.
CO2	Find and use the recently published literature for carrying out research on the selected topic.
CO3	Able to improve presention and communication skills.
CO4	Improve critique skills, as well as keep up-to-date with the current knowledge in the respective research area.
CO5	Able to interpete and discuss the results.
CO6	To provide a background for the research, explain the different techniques, processes and present important findings
CO7	To improve reading habits, promotion of critical thinking and acquisition of critical appraisal skills.
CO8	To strengthening of collegial relationships and team work.
Dissertation/Presentation (Proposal Presentation) [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the research topic .
CO2	State the importance of the problem

CO2	State the importance of the problem.
CO3	Derive planned methods for data collection and analysis.
CO4	Justify that the Aim and Objectives of the topic meet the title of the project.
Research work [Theory | Regular]	
CO ID.	**Course Outcome**
CO	To design the meaningful research problems
CO2	To be able to review and analyse relevent literature
CO3	To plan and execute research methodologies based upon advancements in science and technology
CO4	To be able to prepare and present an effective report/presentation

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Subjectwise Course Outcome - [Pharmaceutics - 2020-21]

FY-SECOND SEMESTER	
Seminar/ Assignment [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Creat presentation using proper format.
CO2	Prepare presentation on the given topic and deliver the contents effectively
CO3	Use effectively audio-visual aids.
CO4	Choose proper format of presentation.
CO5	Use relevant references and apply proper referencing style.
CO6	Defend and answer questions asked during seminar.
CO7	Deliver relevant and useful matter to complete presentation in a stipulated time period.
MPH 201T Molecular Pharmaceutics (Nano Tech and Targeted DDS) [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Recall importance of various drug delivery systems.
CO2	Distinguish between conventional and targeted drug delivery systems.
CO3	Demonstrate the role of biological process involved in drug targeting.
CO4	Outline and select the appropriate drug targeting strategy.
CO5	Design and evaluate various targeted drug delivery systems.
CO6	Summarize the importance of gene therapy.
MPH202T Advanced Biopharmaceutics and Pharmacokinetics [Theory | Regular]	
CO ID.	**Course Outcome**
C01	understand the basic concepts in biopharmaceutics and pharmacokinetics
C02	Understand the processes and terms related to the fate of drug in human body.
C03	Explain and describe the physicochemical, dosage form and patient related factors affecting absorption, distribution, metabolism and excretion of drugs.
C04	Justify the significance of the rate of movement of drug in the body administered by various routes of administration.
C05	Understand the concept of compartment modelling and evaluate the quantity/concentration of drug in body at any point of time
C06	Compare and analyze the in vitro drug release profiles for different marketed products
Computer Aided Drug Delivery System [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Describe the history of computers in pharmaceutical research and development
CO2	Explain the key principles of QbD, QBD development processand risk-based regulatory framework

CO3	Describe the basic screening designs and expanded designs
CO4	Describe the optimization techniques in pharmaceutical formulation
CO5	Describe the QbD guidance review (ICH Q8/Q9/Q10/Q11)
CO6	Interpret and practice the fundamental concepts of computational modeling of drug disposition
CO7	Implement a basic design of experiments (DoE) approach

Cosmetics and Cosmeceuticals [Theory | Regular]

CO ID.	Course Outcome
CO1	Know the key ingradients and building blocks and their importance for the preparation of cosmetic and cosmeceutical products
CO2	Know the Indian regulatory requirements for labelling, import and manufacture of cosmetics and cosmeceuticals.
CO3	Gain scientific knowledge to develop cosmetics and cosmeceuticals with desired safety, efficacy and stability.
CO4	Know the herbal ingradients used in the formulation of Hair care, skin care and oral care and understand challenges in formulating herbal cosmetics.

Pharmaceutics Practical-II [Practical | Regular]

CO ID.	Course Outcome
CO1	To study various factors affecting microsphere preparation to formulate as well as to formulate and evaluate various drug delivery systems like alginate beads, liopsomes, niosomes etc.
CO2	To use techniques for the improvement of dissolution characteristics of slightly soluble drugs and compare dissolution profiles with marketed product.
CO3	To perform pharmacokinetic studies and analyse data by using software
CO4	To understand computer simulations in pharmacokinetics and pharmacodynamics
CO5	To develop and analyse various cosmetic and cosmeceutical herbal preparations

FINAL YEAR IV SEMESTER

No subject found for this semester.

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Subjectwise Course Outcome - [Pharmaceutical Chemistry - 2020-21]

FY-FIRST SEMESTER	
Modern Pharmaceutical Analytical Techniques [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To understand Analytical techniques for identification, characterization and quantification of drugs
CO2	To learn theoretical and practical skills of instrument handling and use.
CO3	To perform structural Elucidation of organic compounds using spectroscopic tools
MPC 102T Advanced Organic Chemistry -I [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Explain the different organic intermediates involved in determining the reaction mechanism such as SN1, SN2 and E1, E2 mechanism.
CO2	Discuss the mechanism and applications of various named reactions
CO3	Explain the applications of various synthetic reagents
CO4	Explain the various protecting and de-protecting groups
CO5	Explain the chemistry, synthesis and mechanism of reactions in heterocyclic compounds
CO6	Explain the principle, applications of retrosynthesis and disconnection approach to develop synthetic routes for small target molecule
MPC 103T Advanced Medicinal chemistry [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To understand different stages of drug discovery
CO2	To understand the role of medicinal chemistry in drug research
CO3	To understand different techniques of drug discovery
CO4	To understand the various strategies to design and develop new drug like molecules for biological targets
CO5	To understand the peptidomimetics and its role in drug discovery
CO6	To understand the impact of the professional pharmacy solutions in societal and environmental contexts, and need for sustainable development.
MPC 104T Chemistry of Natural Products [Theory | Regular]	
CO ID.	**Course Outcome**
CO 1	To know different types of natural compounds and their chemistry and medicinal importance
CO 2	To understand the importance of natural compounds as lead molecules for new drug discovery
CO 3	To know the concept of rDNA technology tool for new drug discovery
CO 4	To learn the general methods of structural elucidation of compounds of natural origin
CO 5	To learn Isolation, purification and characterization of simple chemical constituents from natural source
Pharmaceutical Chemistry Practical II [Practical | Regular]	

CO ID.	Course Outcome
CO1	Estimation and isolation of chemical constituents, drug molecules using modern analytical techniques
CO2	Estimation and isolation of plant based products

Seminar/Assignment [Practical | Regular]

CO ID.	Course Outcome
CO1	To be able to understand and interpret published literature
CO2	To be able to prepare and deliver effective powerpoint presentations.

FINAL YEAR-III SEMESTER

Research Methodology and Biostatistics [Theory | Regular]

CO ID.	Course Outcome
CO1	Discuss different methodologies and techniques used in research work.
CO3	Describe the appropriate statistical methods required for a particular research design
CO2	Explain basic computer skills necessary for the conduct of research.
CO4	Develop a appropriate framework for research studies

Journal Club [Theory | Regular]

CO ID.	Course Outcome
CO1	To understand the structure of research and review articles
CO2	To be able to interpret the results and discussion of a research problem
CO3	To be able to form meaningful research problems
CO4	To learn the communication skills required for delivering effective seminars

Proposal Presentations [Theory | Regular]

CO ID.	Course Outcome
CO2	To be able to plan and execute the work based on the scientific knowledge
CO	To design the meaningful research problems
CO4	To be able to prepare and present an effective report/presentation

Research Work [Theory | Regular]

CO ID.	Course Outcome
CO	To design the meaningful research problems
CO2	To be able to review and analyse relevent literature
CO3	To plan and execute research methodologies based upon advancements in science and technology
CO4	To be able to prepare and present an effective report/presentation

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Subjectwise Course Outcome - [Pharmaceutical Chemistry - 2020-21]

FY-SECOND SEMESTER	
MPC 201T Advanced Spectral Analysis [Theory | Regular]	
CO ID.	**Course Outcome**
CO 1	To learn different analytical instrumental techniques for identification, characterization and quantification of drugs.
CO 2	To understand Interpretation of the NMR, Mass and IR spectra of various organic compounds
CO 3	To know the theoretical and practical skills of the hyphenated instruments
CO 4	To develop and implement the analytical knowledge in identification of organic compounds
MPC 202T Advanced Organic Chemistry-II [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Discuss the principles and applications of green chemistry
CO2	Explain the chemistry, synthesis and side reactions of peptides
CO3	Explain the principles of different types of photochemical and pericyclic reactions.
CO4	Explain the applications of homogeneous and heterogeneous catalysis in the synthesis of drugs
CO5	Discuss the applications of biocatalysis and phase transfer catalysis in organic reaction
CO6	Explain the basic concept of stereochemistry and principle of asymmetric synthesis.
MPC203T Computer Aided Drug Design [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To possess the knowledge of various computational techniques that are useful in new drug discovery
CO2	To understand the role of computational techniques in the designing of new drug molecules.
CO3	To learn various strategies to design and develop new drug like molecules.
MPC-204T Pharmaceutical Process Chemistry [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To understand the strategies for scaling up the manufacturing processes for APIs and intermediates.
CO2	To be able to design various unit processes involved in the synthesis of APIs and intermeidates.
MPC 205P Pharmaceutical Chemistry Practical II [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	To learn the use of computational software in drug design
CO2	To understand the regulatory requirements related to APIs
CO3	To outline the techniques involved in synthesis of organic compounds or drugs.
CO5	To experiment with the synthesis and analysis of organic compounds
Seminar/Assignment [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	To be able to understand and interpret published literature

CO2	To be able to prepare and deliver effective powerpoint presentations.
FINAL YEAR IV SEMESTER	
JOURNAL CLUB [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	To understand the structure of research and review articles
CO2	To be able to interpret the results and discussion of a research problem
CO3	To be able to form meaningful research problems
CO4	To learn the communication skills required for delivering effective seminars
Research Work [Practical | Regular]	
CO ID.	**Course Outcome**
CO2	To be able to plan and execute the work based on the scientific knowledge
CO	To design the meaningful research problems
CO3	To plan and execute research methodologies based upon advancements in science and technology
CO4	To be able to prepare and present an effective report/presentation

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Subjectwise Course Outcome - [Pharmaceutical Quality Assurance - 2020-21]

FY-SEM I	
Modern Pharmaceutical Analytical Techniques [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To understand Analytical techniques for identification, characterization and quantification of drugs
CO2	To learn theoretical and practical skills of instrument handling and use.
CO3	To perform structural Elucidation of organic compounds using spectroscopic tools
Quality Control and Quality Assurance [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Explain the cGMP aspects in a pharmaceutical industry
CO2	Describe the importance of documentation
CO3	Understand the scope of quality certifications applicable to Pharmaceuticalindustries
CO4	Understand the responsibilities of QA & QC departments
Product Development and Technical Transfer [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the principals of drug discovery and development as well as to know the requirements of filing INDA, NDA and ANDA.
CO2	Understand the concept of pre-formulation of drug products and know the techniques for the study of various characteristics of drug and excipients.
CO3	Know the concept of Pilot Plant Scale-up and design layout for various dosage form manufacturing.
CO4	Understand the responsibilities of Quality Assurance and Quality Control department
MQA102T Quality Management System [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand and define quality and its concept
CO2	learn strategic planning and implementation of quality systems
CO3	Understand keys to know customer need and satisfaction
CO4	Describe various tools and systems for quality management
CO5	Understand importance of ICH guidelines and concept of statistical process control
CO6	Learn the concept of benchmarking in quality management
MQA105P Pharmaceutical Quality Assurance I [Practical | Regular]	
CO ID.	**Course Outcome**
CO-1	Perform in-process and finished product quality control tests for tablets, capsules, parenteral and semisolid dosage forms
CO-2	Estimation of drug in pharmaceutical by using modern analytical techniques

CO-3	Development of Stability study protocol for pharmaceuticals
CO-4	Perform pre formulation study for successful formulation of pharmaceuticals
Seminar [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Creat presentation using proper format.
CO2	Prepare presentation on the given topic and deliver the contents effectively
CO3	Use effectively audio-visual aids.
CO4	Choose proper format of presentation.
CO5	Use relevant references and apply proper referencing style.
CO6	Defend and answer questions asked during seminar.
CO7	Deliver relevant and useful matter to complete presentation in a stipulated time period.
FINAL YEAR-III SEMESTER	
Research Methodology [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Discuss different methodologies and techniques used in research work.
CO3	Describe the appropriate statistical methods required for a particular research design
CO2	Explain basic computer skills necessary for the conduct of research.
CO4	Develop a appropriate framework for research studies
Journal Club [Theory | Regular]	
CO ID.	**Course Outcome**
CO-1	Prioritize useful resources among a multitude of publications.
CO2	Find and use the recently published literature for carrying out research on the selected topic.
CO3	Able to improve presentation and communication skills.
CO1	Select the useful resources from the multitude literature available.
CO4	Able to interpret and discuss research methodologies and results.
CO5	To apply research techniques, process and findings.
CO6	Strengthening of Collegial relationships and team work.
Seminar [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Improve oral and written communication & presentation skills
CO2	Explore an aveneu for the knowledge in relation to the pharmacy profession with respect to social and academic context
CO3	Understand and discuss current and real issues related to research, academics & society as a whole

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Subjectwise Course Outcome - [Pharmaceutical Quality Assurance - 2020-21]

FY-SEM II	
MQA201T Hazard and Safety Management [Theory | Regular]	
CO ID.	**Course Outcome**
CO-1	Understand the nature of environment, natural resources and importance of ecosystem
CO-2	Recognize the sources of hazards and the level of the risks associated with them
CO-3	Learn the method of Hazard assessment, procedure, methodology to provide safety standards in Pharmaceutical industries.
MQA 202T Pharmaceutical Validation [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	To understand the concepts of calibration, qualification and validation.
CO2	To learn the qualification of various equipments and instruments.
CO3	To learn and analyse process validation of different dosage forms.
CO4	To understand the validation of analytical method for estimation of drugs.
CO5	To learn cleaning validation of equipments employed in the manufacture of pharmaceuticals.
MQA203T Audit and Regulatory Compliance [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Know briefly about audit objectives and its management
CO2	Understand the role of audits in pharmaceutical manufacturing
CO3	Learn the requirements for auditing vendors supplying various raw materials and equipments
CO4	Understand the audit of microbiological laboratory and engineering systems
MQA204T Pharmaceutical Manufacturing Technology [Theory | Regular]	
CO ID.	**Course Outcome**
CO1	Understand the basic requirements in pharmaceutical industry development
CO2	Understand the practices of aseptic process technology
CO3	Learn Non-sterile manufacturing technology
CO4	Know Quality by Design and Process analytical technology
MQA205P Pharmaceutical Quality Assurance I [Practical | Regular]	
CO ID.	**Course Outcome**
CO-1	Perform the Qualification and validation of an equipment's, instruments and analytical method for pharmaceuticals
CO-2	Identification & estimation of drug in pharmaceuticals & assess the impurities
CO-3	Application of Case study on QbD
Seminar [Practical | Regular]	
CO ID.	**Course Outcome**
CO1	Creat presentation using proper format.

CO2	Prepare presentation on the given topic and deliver the contents effectively
CO3	Use effectively audio-visual aids.
CO4	Choose proper format of presentation.
CO5	Use relevant references and apply proper referencing style.
CO6	Defend and answer questions asked during seminar.
CO7	Deliver relevant and useful matter to complete presentation in a stipulated time period.
FINAL YEAR IV SEMESTER	
No subject found for this semester.	