B-PHARM COURSE SUBJECTS

FIRST YEAR SEM I

Upon acquiring Knowledge & skill the student would be able to achieve the following:

SEM-I

HUMAN ANATOMY AND PHYSIOLOGY I - BP101T & 107P

Knowledge

1. Explain the relevance and significance of Human Anatomy and Physiology to Pharmaceutical Sciences.
2. Explain basic terminologies used in anatomy and physiology as well as prefixes & suffixes Used to identify body parts and directional terms.
3. Explain the gross morphology, structure and functions of various organs of the human body.
4. Explain the anatomy & physiology of skeletal system.
5. Describe the various homeostatic mechanisms and their imbalances.
6. Identify the various tissues and organs of different systems of human body.

Skill

1. Explain the construction, working, care and handling of various materials, instruments, glassware and equipments required for understanding the practical.
2. Explain the precautions taken by student while doing the practical in the laboratory.
3. Demonstrate the simple laboratory techniques.
4. Clarify significance of bleeding time, clotting time, detection of blood group, haemoglobin Detection, and W.B. C. count, R.B. C. count of blood sample, ESR and blood pressure determination.
5. Identification of different types of bones

PHARMACEUTICAL ANALYSIS I- BP102T & BP108P

Knowledge

1. To understand the basic terms of analytical chemistry and Illuminate relevance & significance of Analytical Chemistry to Pharmaceutical Sciences.
2. To analyze different types of Errors in analysis and To identify the impurities using various Limit tests given in Pharmacopoeia
3. To study basic concepts, types and principles of Various Volumetric

Methods

4. To study basic concepts, principle of Gravimetric method of analysis
5. To understand basic concepts, types and principles of Various Electrochemical methods of analysis.

Skill

1. To develop analytical skills by applying theoretical knowledge of various titrations
2. To understand the calibration of various Instruments
3. To carryout various volumetric and electrochemical titrations using instruments.
4. To identify the pKa of Monobasic, dibasic and tribasic acids
5. To analyse the refractive index, molar refraction and optical rotation using refractometer and polarimeter

PHARMACEUTICS I- BP103T & BP109P

Knowledge

1. Know the history of profession of pharmacy
2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
3. Understand the professional way of handling the prescription
4. Preparation of various conventional dosage forms

Skill

1. Skill to learn weighing and measuring
2. Skill to understand basic knowledge
3. Skill to learn formulation
4. Skill to learn labeling and evaluation

PHARMACEUTICAL INORGANIC CHEMISTRY-104T & 110P

Knowledge

1. Knowledge to Impurities in pharmaceutical substances
2. Knowledge of Acids, Bases and Buffers
3. Knowledge Gastrointestinal agents
4. Knowledge to Miscellaneous compounds.
5. Knowledge to Radiopharmaceuticals

Skill

1. Skill for use of Limit tests for ions
2. Skill for Identification test
3. Skill for Test for purity
4. Skill to Preparation of inorganic pharmaceuticals

COMMUNICATIONS SKILL- BP105T & BP111P

Knowledge

1. Gain knowledge & Understand the behavioural needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
2. Knowledge to improve Communication effectively
3. Knowledge for Effectively manage the team as a team player
4. Knowledge to prepare & Develop interview skills
5. Knowledge to Develop Leadership qualities and essentials

Skill

1. Skill to learn modules using English language software
2. Skill to understand basic knowledge
3. Skill to learn pronunciation
4. Skill to learn advanced and implement in communication

REMEDIAL BIOLOGY - BP 106RBT

Knowledge

1. Gain knowledge & Understand the core and basic knowledge associated with Biology and the profession of pharmacy
2. Knowledge to correlate the role of biology in pharmacy
3. Knowledge to effectively plan including time management, resource management, delegation skills and organizational skills
4. To reason the role of living organisms and its correlation with other subjects of pharmacy

REMEDIAL BIOLOGY- BP112RBP

Skill

1. Skill to learn basic techniques
2. Skill to understand basic
3. Skill to handle samples from biological source
4. Skill to handle basic equipment

SEM-II

HUMAN ANATOMY AND PHYSIOLOGY II - BP 201T & 207 P

Knowledge

1. Knowledge and gross morphology, structure and functions of Nervous system in humans
2. Knowledge of digestive system homeostatic mechanisms and their imbalances.
3. Knowledge of respiratory and urinary system homeostatic mechanisms and their imbalances
4. Knowledge and gross morphology structure and functions of endocrine system in humans
5. Knowledge and gross morphology structure and functions of reproductive system and genetics in humans

Skill

1. Explain the gross morphology, structure and functions of various organs of the human body.
2. Describe the various homeostatic mechanisms and their imbalances.
3. Identify the various tissues and organs of different systems of human body.
4. To acquire Skill for bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.
5. Appreciate coordinated working pattern of different organs of each system
6. Appreciate the interlinked mechanisms in the maintenance of normal functioning homeostasis) of human body.

Pharmaceutical Organic Chemistry -BP202T & BP208P

Knowledge

1. Knowledge to Classification of Organic Compounds Common and IUPAC systems of nomenclature of organic compounds
2. Knowledge of Alkanes, Alkenes and Conjugated dienes
3. Knowledge Preparation and reactions of Alkyl halides Organic Compounds
4. Knowledge to Preparation and reactions Carbonyl compounds (Aldehydes and ketones).
5. Knowledge to study Carboxylic acids and Aliphatic amines Organic Reactions

Skill

1. Skill for Systematic qualitative analysis of unknown organic compounds
2. Skill for Preparation of the derivatives and confirmation of the unknown compound.
3. Skill for Construction of molecular models

BIOCHEMISTRY - BP203 T & BP 209 P

Knowledge

1. Understand basic knowledge of metabolism
2. Acquire knowledge about central dogma of molecular biology
3. Understand the hierarchy of regulation in living cell
4. Gain basic knowledge about the various targets for therapy
5. Significance of balanced diet and its utilization.
6. Understanding various genetic disorders in metabolism

Skill

1. Knowledge to understand basic concept of macromolecule identification
2. Knowledge of enzyme and its kinetics
3. Knowledge for various diagnostic techniques for metabolic disorders.
4. Knowledge of handling basic equipment in biochemistry and biological samples

PATHOPHYSIOLOGY- BP 204T

Knowledge

1. Explain the definition, etiology, pathogenesis, signs, symptoms and complications of the diseases.

COMPUTER APPLICATION IN PHARMACY- BP205 T & BP210P

Knowledge

1. Use the Appropriate method on Number system to solve the given problem.
2. Apply the various tags in Web Technology to design a program.
3. Use the appropriate system and application of computers in pharmacy.
4. Apply the concepts of Bioinformatics in pharmacy.
5. Apply the concepts of computers as a data analysis in preclinical development.

Skill

1. Use the appropriate tags and design web technology program.
2. Design and implement database using MS Access.
3. Generate and print reports on database.
4. Exporting Tables, Queries, Forms and Reports to web pages and XML pages.

ENVIRONMENTAL SCIENCES- BP 206 T

Knowledge

1. Knowledge Create the awareness about environmental problems among learners
2. Impart basic knowledge about the environment and its allied problems
3. Knowledge gain for to develop an attitude of concern for the environment.
4. Through knowledge Motivate learner to participate in environment protection and environment improvement.
5. Knowledge for Acquiring skills to help the concerned individuals in identifying and solving environmental problems
6. Through Strive to attain harmony with Nature.

SECOND YEAR BACHELOR OF PHARMACY SEM III

PHARMACEUTICAL ORGANIC CHEMISTRY II BP301T

Knowledge

BP301T .1K	Write the structure, name and the type of isomerism of the organic compound.
BP301T .2K	Write the reaction, name the reaction and orientation of reactions.
BP301T .3K	Account for reactivity/stability of compounds,

PHYSICAL PHARMACEUTICS-I BP 302T

Knowledge

302.1K	Investigate and apply various laws and theories, equations related to different states of matter
302.2K	Distinguish the principles of complexation/protein binding and to use them for calculations of drug release and stability constant.
302.3K	Demonstrate the use of physicochemical properties of drugs in the formulation development and evaluation of dosage forms

PHARMACEUTICAL MICROBIOLOGY BP 303T

Knowledge

BP 303T.1K	Gain knowledge & Understand methods of identification, cultivation and preservation of various microorganisms
BP 303T.2K	Knowledge to understand the importance and implementation of sterlization in pharmaceutical processing and industry

PHARMACEUTICAL ENGINEERING BP304T

Knowledge

BP304T.1K	To know various unit operations used in Pharmaceutical industries.
BP304T.2K	To understand the material handling techniques.
BP304T.3K	To perform various processes involved in pharmaceutical manufacturing process.
BP304T.4K	To carry out various test to prevent environmental pollution.
BP304T.5K	To appreciate and comprehend significance of plant lay out design for optimum use of resources.

PHARMACEUTICAL ORGANIC CHEMISTRY II BP305P

Skill

BP305P .1S	Laboratory Techniques such as recrystallisation techniques , Steam distillation
BP305P .2S	Determination of oil values
BP305P .3S	Prepare organic compounds

PHYSICAL PHARMACEUTICS-I-PRACTICALBP306P

Skill

306.1S	Operate different pharmaceutical laboratory instruments used in determining various physicochemical properties such as surface tension, viscosity, adsorption and solubility, HLB and partition coefficient.
306.2S	Study effect of various factors on states of matter
306.3S	Study of complexation by different methods

PHARMACEUTICAL MICROBIOLOGY PRACTICALBP307P

Skill

BP307P.1S	Skill to learn basic techniques of aseptic handling and sterilization
BP307P.2S	Skill to understand basics in microbiology
BP307P.3S	Skill to handle microorganisms
BP307P.4S	Skill to learn standardization of pharmaceutical products microbiologically

PHARMACEUTICAL ENGINEERING PRACTICAL BP308P

Skill

BP308P.1S	To know various unit operations used in Pharmaceutical industries.
BP308P.2S	To perform various processes involved in pharmaceutical manufacturing process.
BP308P.3S	To appreciate and comprehend significance of plant lay out design for optimum use of resources.

SECOND YEAR B-PHARM SEM-IV

PHARMACEUTICAL ORGANIC CHEMISTRY II BP401T

Knowledge

BP401T .1K	Understand the methods of preparation and properties of organic compounds.
BP401T .2K	Explain the stereo chemical aspects of organic compounds and stereo chemical reactions
BP401T .3K	Know the medicinal uses and other applications of organic compounds

MEDICINAL CHEMISTRY-I BP402T

Knowledge

BP402T.1K	Know general aspects of the design of the drugs.
BP402T.2K	Knowledge to understand the history, classification, nomenclature and chemistry of drugs with respect to their pharmacological activity.
BP402T.3K	Knowledge of drug metabolic pathways, adverse effects and therapeutic value of drugs.
BP402T.4K	Knowledge of Structure activity relationship of different classes of drugs.
BP402T.5K	Knowledge of chemical synthesis of some drugs.

PHYSICAL PHARMACEUTICS IIBP403T

Knowledge

403.1K	relate various physicochemical properties of drug and excipient molecules in designing dosage forms
403.2K	Distinguish the principles of chemical kinetics and to use them for stability testing and determination of expiry date of formulations
403.3K	Demonstrate the use of physicochemical properties of drugs in the formulation development and evaluation of dosage forms

PHARMACOLOGY I CODEBP 404 T

Knowledge

BP 404 T. 1k	To Understand the pharmacological actions of different categories of drugs
BP 404 T. 2k	To Understand mechanism of drug action, Pharmacokinetic, Pharmacodynamics, Adverse effect, at organ system/sub cellular/macromolecular levels
BP 404 T.3k	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
BP 404 T.4k	Appreciate correlation of pharmacology with other bio medical sciences

PHARMACOGNOSY I BP405T

Knowledge

BP 405 T.1K	Introduction to the subject Pharmacognosy, crude drugs and quality control aspects of crude drugs
BP 405 T.2K	Cultivation, Collection, Processing and storage of drugs of natural origin & Conservation of medicinal plants
BP 405 T.3K	Introduction to Plant tissue culture
BP 405 T.4K	Introduction to secondary metabolites and anatomy of plant parts from which they are obtained
BP 405 T.5K	Study of biological source, chemical nature and uses of drugs of natural origin

MEDICINAL CHEMISTRYI PRACTICAL BP406P

Skill

BP406P.1S	Skill to make correct use of various equipments and take safety measures while working in Medicinal Chemistry Laboratory.
BP406P.2S	Skill to Synthesize medicinally important compounds and purify them using, TLC & Column Chromatography.
BP406P.3S	Skill to Characterize the synthesized compounds using IR and NMR spectra's
BP406P.4S	Skill to Purify the solvents using fractional and vacuum distillation.
BP406P.5S	Skill to Explain reaction mechanisms involved in synthesis of medicinally important compounds.

PHYSICAL PHARMACEUTICS IIBP407P

Skill

BP407P.1S	Study various micromeritic and rheological properties
BP407P.2S	Study effect of various factors on suspensions and colloids
BP407P.3S	Study and determine various kinetic parameters

PHARMACOLOGY I PRACTICALBP408P

Skill

BP 408 P.1S	Understand the in vivo and in vitro experiments, use of software for the study of preclinical experiments.
BP 408 P.2S	Observe the effect of drugs on animals by simulated experiments
BP 408 P.3S	Get knowledge about recent development in pharmacology

PHARMACOGNOSY I PRACTICAL BP 409P

Skill

BP 409 T.1S	Analysis of crude drugs by chemical tests: **(**i)Tragaccanth (ii) Acacia (iii)Agar (iv) Gelatin (v) starch (vi) Honey (vii) Castor oil
BP 409 T.2S	Determination of stomatal number and index
BP 409 T.3S	Determination of vein islet number, vein islet termination and paliside ratio.
BP 409 T.4S	Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer
BP 409 T.5S	Determination of Fibre length and width
BP 409 T.6S	Determination of number of starch grains by Lycopodium spore method
BP 409 T.7S	Determination of Ash value
BP 409 T.8S	Determination of Extractive values of crude drugs
BP 409 T.9S	Determination of moisture content of crude drugs
BP 409 T.10S	Determination of swelling index and foaming

THIRD YEAR SEM V

INDUSTRIALPARMACY-I

Knowledge:

1. Understand the concepts of solid dosage form design & formulation strategies.
2. Explain tablets as a dosage form, physico-chemical principles guiding tablet
3. formulation, various tablet additives, manufacture & evaluation, equipments, defects in tabletting & remedies.
4. Learn the concept, types, pharmacopoeial specifications, techniques & equipments used in tablet coating.
5. Describe capsules, types, additives, size selection, manufacturing & evaluation, equipments, &defects.
6. To understand the concept of technology transfer

Skills:

1. State the correct use of various equipments in Pharmaceutics laboratory
2. Relevant to tablets, capsules &coating.
3. Explain formulation, evaluation and labeling of tablets &capsules.
4. Perform pharmaceutical calculations to determine evaluation parameters like
5. Hausner ratio, Heckel plot & Kawakita plot of preparations.
6. To understand rational behind use of formulation ingredients.

7. To learn the equipments and apparatus needed for the preparation as per SOP.
8. Select the suitable packaging material (container-closure) for the preparation.
9. Prepare labels to suit regulatory requirements.
10. To learn the conduct survey and report its finding.

PHARMACEUTICAL ANALYSIS -III

Knowledge:

1. Explain the different types of instrumental analytical techniques available for quality control of APIs & formulations.
2. various sampling techniques employed in analysis of solid, semisolid and liquid dosage forms while working in industry
3. Explain the principles, instrumentation and applications of UV-VIS, Flourimetry, Atomic absorption, atomic emission spectroscopes, Flame photometry, Phosphorimetry and Nepheloturbidimetry.

Skills:

1 Independently operate, calibrate various analytical instruments for the assay of various APIs and formulations as per Pharmacopoeial standards.

2 Independently process, interpret the data obtained through experimentation and report the results as per regulatory requirements.

3Take appropriate safety measures while handling instruments, chemicals and apparatus.

MEDICINAL CHEMISTRY-I

Knowledge:

1.Know general aspects of the design of the drugs.

2. history, classification, nomenclature structure activity relationship (SAR), mechanism of action, therapeutic uses, adverse
effects and recent developments in categories such as adrenergic & cholinergic agents and drugs affecting cardiovascular system.

Skills:

- Make correct use of various equipments and take safety measures while working in Medicinal Chemistry Laboratory.
- Synthesize medicinally important compounds and purify them using, TLC & Column Chromatography.
- Characterize the synthesized compounds using IR and NMR spectra's.
  Purify the solvents using fractional and vacuum distillation.
- Explain reaction mechanisms involved in synthesis of medicinally important compounds.

PHARMACOLOGY- II

Knowledge:

1. The Neurotransmitters involved in the autonomic nervous system, there Synthesis and Metabolism.
2. Various adrenoreceptors and cholinoceptor, their subtypes and the clinical spectrum of their general and selective agonist and antagonist.
3. The agents that stimulate or relax skeletal muscle, including the cholinergic neuromuscular agonists and antagonists as well as the neuromuscular agents
4. acting at noncholinergic sites.
5. The essential pharmacotherapy and pharmacological features of common and important drugs used in cardiovascular diseases and respiratory disorders.

Skills

1. The guidelines for animal experimentations. Various routes of drug administration, methods for blood collection from experimental animals.
2. Composition of physiological salt solutions and basic instruments used in experimental pharmacology.
3. Performance of isolated experiments using various isolated preparation and the effects of different drugs on the concentration response curves.
4. Study the action of various drugs using preclinical models/ computer simulations.

ANALYTICAL PHARMACOGNOSY & EXTRACTION TECHNOLOGY

Knowledge:

1.Comprehend & explain underlying principle of mass transfer process in extraction, Effect of various factors, specific care in herbal material, & various approaches in Extraction processes with their theoretical consideration, methodological steps, & applications. Understand & explain principle & applications of chromatographic& nonchromatographic separation methods.

2. Explain source material & extraction methods of phytochemicals specified; Draw schematic representation of such processes;

·3.Explain need of analysis of natural products & explain their significance; Understand &explain various parameters with their principles, significance & applications.

Skill:

1. Explain & demonstrate correct handling of inflammable solvents & corrosive chemicals.Generate micrometric data & identify the crude drugs.
2. Conduct successive extraction & qualitative tests to ascertain chemical nature of crude drugs. Apply theoretical knowledge obtained for extraction of phytochemicals, set extraction Assembly process material before extraction; explain significance of use of various chemicals/solvents/ conditions; undertake extraction, verify extracted material by qualitative tests & report yield.
3. Apply theoretical knowledge of various quality control parameters studied in theory,
4. explain significance of use of various chemicals/solvents/conditions; undertake various estimations /determinations; infer from results obtained & report evaluation results.
5. Able to handle various equipments as per SOPs & learn various demonstrations
6. (of experiments).
7. Understand meaning & significance of 'Good Laboratory Practices' learn in theory &demonstrate through laboratory behavior.
8. Listen carefully, raise logical query, draw information, understand rationale during Field visits & prepare brief report for evaluation.

PHARMACEUTICAL BUSINESS MANAGEMENT & DISASTER MANAGEMENT

Knowledge:

1. To learn the Pharmaceutical business and management strategy.
2. To gain knowledge of marketing research, product management.
3. To learn about human resource and development needs.
4. To learn about the disaster management and preparedness ,mitigation

ACTIVE PHARMACEUTICAL INGREDIENTS TECHNOLOGY

Knowledge:

1. Explain basics chemical process kinetics with respect to various classes of reactions.
2. Explain chemical process, reaction system, equipment used in API manufacturing and layout design.
3. Explain design of synthetic routes, optimization of reactions, raw material and reagents selection; scale up techniques, quality control aspects, Material Safety Data Sheet (MSDS), environmental aspects, green chemistry approaches, health hazards of chemical handling and manufacturing process flow charts of some important APIs.
4. Explain manufacturing techniques of some chiral APIs and polymorphism in APIs
5. Practice Quality Assurance (QA), Quality Control (QC) and follow GMP in API manufacturing including ICH Q7, Q7A and Q11 while working in API industry.

THIRD YEAR SEM –VI

INDUSTRIAL PARMACY –II

Knowledge:

1 .Explain disperse systems, its classification, theories of disperse systems, thermodynamic v/s kinetic stability considerations.
2. Explain suspensions, types, formulation development, manufacturing, excipients used, evaluation of suspensions etc.
3 .Describe emulsions, their physico-chemical properties, theory of emulsification,

HLB value & phase inversion temperature, Kraft point, cloud point, excipients,

4. formulation & evaluation of emulsions; cracking, coalescence, stability & stress testing.

5. Explain semi-solids, anatomy & physiology of skin, selection of bases; penetration enhancers, formulation development, Percutaneous absorption, flux measurement & evaluation.

6.Describe layout for manufacturing of suspensions, emulsions & semi-solids as per schedule M.

Skills:

1.State the correct use of various equipments in Pharmaceutics laboratory relevant to suspensions, emulsions & semi-solids, prepare BMR.

2.Explain & carry out formulation of Suspensions like Calamine lotion, Milk of Magnesia, Paracetamol Suspension, Antacid Suspension & carry out Evaluation.

3.Formulate emulsions: Liquid paraffin oral Emulsion, Turpentine Liniment, Formulation of Emulsion with HLB Consideration &evaluation.

4.Describe use of ingredients in formulation and category of formulation.

5.Prepare semisolids: Pain balm, Antifungal ointment/cream, Medicated Gel, Antiacne preparation, Non staining Iodine ointment with Methyl Salicylate & evaluation.

6.Prepare the labels so as to suit the regulatory requirements.

PHARMACEUTICAL ANALYSIS –IV

Knowledge:

1 .Explain principles, instrumentation and applications of various chromatographic, thermal, X ray,Diffraction and radio chemical techniques employed for the analysis of APIs and formulations.

2. Validate various analytical instruments & methods as per ICH/USP guidelines.

Skills:

1.Independently operate and calibrate various analytical instruments for the assay of various APIs and formulations as per Pharmacopoeial standards.

2.Independently process, interpret the data obtained through experimentation and report the results as per regulatory requirements.
3.Independently validate UV-VIS Spectrophotometric assay method as per ICH guidelines.
4.Take appropriate safety measures while handling instruments, chemicals and apparatus.

MEDICINAL CHEMISTRY-II

Knowledge:

1.Know general aspects of drug metabolism, the drug design aspects on the basis of drug metabolism and metabolism of therapeutically important drugs.
2.Know the general aspects of design of the drugs, history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, therapeutic uses, adverse effects and recent developments in the CNS active drugs and drugs acting on blood.

Skills:

1.Make correct use of various equipments and take safety measures while working in Medicinal Chemistry Laboratory.
2. Synthesize medicinally important compounds and purify them using recrystallization techniques.
3. Synthesize medicinally important compounds by microwave assisted synthesis.
4. Characterize the synthesized compounds using IR and NMR spectra's.
5 .Purify the solvents using fractional and vacuum distillation.
6. Explain reaction mechanisms involved in synthesis of medicinally important compounds.

PHARMACOLOGY- III

Knowledge:

1. The pharmacology and pharmacotherapy of various general and local anesthetics.
2. The appropriate drug therapy and management of patients with specific CNS disorders.
3. The indications, mechanism of action, adverse effects and contraindications for the major classes of drugs used in the treatment of Parkinson's Disease, Migraine and

Alzheimer's disease.

4. Pharmacological features of different classes of NSAIDs.

5 .The essential pharmacotherapy of Rheumatoid Arthritis, Osteoarthritis and Gout.

Skills:

1.The basic principles of bioassay, types of bioassay along with advantages and disadvantages.

2. Performance of isolated experiments using various isolated preparation and the effect of different drugs on the concentration response curves.

3. Study the preclinical screening of various drugs.

NATURAL PRODUCT CHEMISTRY

Knowledge:

1 .Understand & explain tools & techniques used in study of biosynthetic pathways in plants.

2. Explain source, chemistry & applications of drugs from marine origin. He/she should be able to compare & contrast marine & terrestrial sources of medicinal materials.

3. Explain difficulties in elucidation of biosynthetic pathways in plant & explain approaches used with their merits & demerits.

4. Understand & explain underlying reasons as why natural products are appropriate material in discovering new drugs & also explain their contribution in modern drug discovery.

5.Explain source, extraction, processing, chemistry & applications of natural products used in pharmaceutical & allied industry such as coloring, sweetening agents & polymers.

6. Compare & contrast nutraceuticals & functional foods & understand & explain their significance.

7. Explain & classify natural products used as dietary supplements.

8.Understand & explain significance of natural pesticides & explain source, chemistry & applications.

9.Explain source, extraction, processing, chemistry & applications of natural products used in pharmaceutical & allied industry such as bioavailability & skin permeation

agents; wound healing agents, biofuels.

Skill:

1.Extract & subsequently conduct experiments to derive various physical constants required in characterization of natural products.

2.Charge, elute & gather pure material using column chromatography.

3.Record UV/IR spectrum of given sample & interpret them.

4.Able to perform the evaluation of isolated phytoconstituents by chemical, chromatographic and spectral means.

5. Listen carefully, raise logical query, draw information, understand rationale during field visits & prepare brief report for evaluation.

BIO-ORGANIC CHEMISTRY AND DRUG DESIGN

Knowledge:

1. Explain the significance of Bioorganic Chemistry and establish its relevance in drug design and discovery.

2 .Describe various approaches in rational drug design.

3. Explain various drug targets and their biochemical features, physiological &pathophysiological roles and their significance in drug design.

4 . Explain pro-drug concept in drug design.

PHARMACEUTICAL BIOTECHNOLOGY

Knowledge:

- Define Biotechnology & its state its scope in pharmacy
- Know the basics of biotechnology techniques and the various systems used.
- Know the method of genetic engineering for production of rDNA products
- including monoclonal antibodies.
- Know the information about the application of genetic engineering in animals.
- Have a knowhow of enzymes and their uses by immobilization.
- Illustrate use of Fermenter for production of fermentation products an information about their purification by downstream process.
- State the application of Fermenter process in production of vitamins and antibiotics

FINAL YEAR SEM VII

STERILE PRODUCTS

Knowledge:

1. Describe the General requirements, routes of administration, significance of tonicity adjustment and sterility and Pre-formulation of sterile products
2. Describe various packaging materials used, types, choice of containers, official quality Control tests and methods of evaluation.
3. Describe the GMP and design and layout of Parenteral Production Facility, environmental control zones, heating ventilation air conditioning (HVAC), HEPA filter and laminar area flow systems.
4. Explain Classification and formulation of SVP, types and selection of vehicles and added substance, processing, manufacturing and Quality control of SVPs along with Special types of SVPs and Pilot plant scale up.
5. Explain Large Volume Parenterals (LVPs),Types, concept of formulation, influence of physiological factors, processing, manufacturing and Quality control of LVPs, along with Parenteral Nutrition, intravenous admixture and Peritoneal dialysis fluid and Pilot plant scale up.
6. Explain General requirements, formulation, types and evaluation of ophthalmic products.
7. Describe Blood Products and Surgical Dressings

Skills:

1. Formulation development and Pharmacopoeial evaluation and labeling of SVPs, LVPs, and ophthalmic preparations
2. Expertise in sealing of ampoules
3. Describe use of ingredients in formulation and category of formulation
4. Pharmacopoeial evaluation of packaging materials
5. Importance and validation of aseptic area
6. Evaluation of marketed preparations

7 Significance and Accelerated stability testing of marketed samples.

PHARMACEUTICAL ANALYSIS –V

Knowledge:

1. Understand principles, instrumentation of Infra red (FTIR, NIR) Raman, Gas Chromatography, Flash Chromatography, Super critical fluid chromatography Atomic Emission spectroscopy, and their applications in Pharmaceutical industry.
2. Know about electron microscopy.

Skills:

1. Independently operate and calibrate various analytical instruments for the Separation/isolation and assay of various APIs and formulations as per Pharmacopoeial standards.
2. Independently process, interpret the data obtained through experimentation and report the results as per regulatory requirements.
3. Take appropriate safety measures while handling instruments, chemicals and apparatus.

MEDICINAL CHEMISTRY-III

Knowledge:

1. Know general aspects of the design & development of drugs
2. history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses and recent developments in therapeutic categories such as NSAIDs, steroidal anti-inflammatory drugs, narcotic & non-narcotic analgesics, antipyretics, autacoids and drugs acting on respiratory & GI tract..

Skills:

1. Make correct use of various equipments & take safety measures while working in medicinal chemistry laboratory.
2. Develop skills involved in thin layer chromatography techniques and purification of synthesized compounds by column chromatography.
3. Synthesize, recrystallize and understand reaction mechanisms involved in synthesis of medicinally important organic compounds.
4. To interpret the spectral characterizations made by IR and 1H-NMRs of synthesized compounds.

PHARMACOLOGY-IV

Knowledge

1. Get in-depth knowledge about pharmacology and pharmacotherapy of drugs used in infectious diseases, cardiovascular disorders etc.
2. Understand the involvement of oxidative stress and role of antioxidants along with some safety issues in pharmacology.

Skill:

1. Understand the importance of isolated preparation, mechanism of action of drugs on isolated tissues, expertise in performing bioassay of drugs.
2. Analyze the rational and irrational fixed dose combinations based on various parameters.
3. Understand the prescription pattern and rational use of drugs by performing case study or doing hospital visit.

NATURAL DRUG TECHNOLOGY

Knowledge:

1. Understand & explain various difficulties in standardization of herbal material, new approaches evolved, and steps in development of plant monograph.
2. Understand & explain need & significance of plant material authentication, new Approaches used with their merits & demerits.
3. Comprehend & explain various factors affect on level of secondary metabolites, how these can be minimized to ensure quality in raw material, effect of post harvesting manipulations, and changes during storage etc& methods to control these modification. Explain various guidelines issued by WHO in relation with cultivation, collection, storage etc.
4. Understand & explain concept of health & pathogenesis, philosophical basis, diagnosis & treatment aspects of Ayurveda, Unani, Siddha &Homoepatic system of medicine;
5. Understand & explain method of preparation of Ayurvedic dosage forms; significance of novel drug delivery of natural products; herbs used in cosmetic preparation & methods of their formulations.
6. Compare & contrast nutraceuticals & functional foods & understand & explain their significance. Explain & classify natural products used as dietary supplements.
7. Understand & explain significance of natural pesticides & explain source, chemistry &

applications.

8. Explain source, extraction, processing, chemistry & applications of natural products used in pharmaceutical & allied industry such as bioavailability & skin permeation agents; wound healing agents, biofuels.

Skill:

1. Prepare, label & evaluate herbal/TSM formulations
2. Evaluate marketed cosmetic & nutraceutical formulations
3. Conduct preformulation parameters & understand underlying rationale
4. Conduct in vitro assays for correlation with biological efficacy
5. Able to handle various equipments as per SOPs & learn various demonstrations (of experiments).
6. Listen carefully, raise logical query, draw information, understand rationale during field visits & prepare brief report for evaluation.

BIO-PHARMACEUTICS & PHARMACOKINETICS

Knowledge

Understanding the concept of biopharmaceutics and its applications in formulation development.

- Studying pharmacokinetic processes and their relevance in efficacy of dosage form.
- Learning the concepts of bioavailability and bioequivalence studies.
- Learning various compartmental models and non compartmental analysis methods.
- Understanding concept and mechanisms of dissolution and in vitro in vivo correlation.

PHARMACEUTICAL JURISPRUDENCE

Knowledge

1) To understand .Basic principles, purpose and dimensions of the laws
2) To understand the significance and relevance of Pharmaceutical laws in India
3) Important rules and regulations and procedures made to execute the laws
4) To discuss the purpose of the Board
5) To explain the definitions in the Act;
6) To describe the qualifications for membership and the make-up of the Board

7) To explain the rule-making authority of the Board;

8) To discuss the responsibilities of the Board;

9) To discuss inspections by the Board or its representative;

10) To learn the various laws governing the manufacturing, sale, research & usage of drugs

11)To understand significance of Schedule M and Schedule Y related Manufacturing & clinical trials

12) Identify potential fraud and abuse legal issues of narcotic & psychotropic substance.

13) To study quality & prices of essential medicine

14) Learner knowledge about Patents, procedure for patent application and IPR.

15) To understand the regulatory system for safety and effectiveness of medicine and quality of product

FINAL YEAR SEM VIII

ADVANCED DRUG DELIVERY SYSTEM

Knowledge:

1. Describe the Fundamental Concept of Modified Drug Release and Pre requisites of drug candidates, along with various approaches and classification
2. Describe Polymers with respect to introduction to polymers, classification, types, selection, application and examples.
3. Describe. Introduction, formulation, merits, demerits, application and evaluation of Novel Drug Delivery Systems
4. Explain Therapeutic Aerosols along with typical formulations from, metered dose, intranasal and topical applications,
5. Explain concept of microencapsulation, merits, demerits and application, Types of Microencapsulation and Evaluation of microcapsules
6. Explain Basic concept of optimization

Skills:

1. Formulation development and evaluation of sustained release, transdermal, gastro retentive formulations
2. Micro encapsulation techniques
3. Evaluation of marketed preparations
4. Optimization studies using 23 factorial design

COSMETIC SCIENCE

Knowledge:

• Understand the concepts of cosmetics, anatomy of skin v/s hair, general excipients used in cosmetics.

• Explain formulation of cosmetics for skin, manufacturing, equipments &evaluation of creams like cold cream, vanishing cream etc. & powder cosmetics.

• Explain formulation of cosmetics for hair, manufacturing & evaluation of hair shampoos, tonics etc.

• Describe formulation of cosmetics for eyes, manufacturing & evaluation of eye mascara, shadow etc.

• Understand formulation of manicure products like nail lacquer, remover etc.

• Learn formulation, manufacture & evaluation of baby cosmetics like baby oils, powders etc.

• Explain the concept of cosmeceuticals, history, difference between cosmetics & cosmeceuticals & cosmeceutical agents.

Skills:

• State the correct use of various equipments in Pharmaceutics laboratory relevant to cosmetics.

• Perform formulation, evaluation and labelling of cosmetics like moisturising cream, vanishing cream etc.

• Perform formulation, evaluation of eye cosmetics, nail lacquer & shampoo.

• Perform formulation, evaluation & labelling of shaving cream, after shave & baby products.

• Describe use of ingredients in formulation and category of formulation.

• Prepare labels as per regulatory requirements.

PHARMACEUTICAL ANALYSIS-VI

Knowledge:

1. Understand principles, instrumentation of NMR and ESR spectroscopy, HPLC and their applications in Pharmaceutical research, quality control of APIs & formulations.

2. Understand the basic principle, instrumentation of Mass Spectrometry.

Skills:

1. Independently operate and calibrate various analytical instruments for the assay of various APIs and formulations as per Pharmacopoeial standards.
2. Independently process, interpret the data obtained through experimentation and report the results as per regulatory requirements.
3. Take appropriate safety measures while handling instruments, chemicals and apparatus.

MEDICINAL CHEMISTRY-IV

Knowledge:

1. Know general aspects of the design & development of drugs.2
2. Know history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses and recent developments in categories such as chemotherapeutic agents, antibiotics, hormones & anti-fertility agents.

Skills:

1. Make correct use of various equipments & take safety measures while working in medicinal chemistry laboratory.
2. Understand and develop skills in various demonstrated experiments such as High Vacuum distillation, recrystallization and pH based amino acid separation.
3. Develop skills involved in thin layer chromatography techniques and purification of synthesized compounds by column chromatography.
4. Synthesize, recrystallize and understand reaction mechanisms involved in synthesis of medicinally important organic compounds.
5. Interpret the spectral characterizations made by IR and 1H-NMRs of synthesized compounds.

PHARMACOLOGY-V

Knowledge:

1. Understand various methods of drug-drug interaction inside the body.
2. Understand the mechanism of adverse drug reactions and pharmacovigilance.
3. Get knowledge about recent development in pharmacology

Skill:

1. Understand the in vivo and in vitro experiments, use of software for the study of preclinical experiments.
2. Brief idea about statistics, its applications and how to solve problems using various statistical tests.

NATURAL PRODUCTS: COMMERCE, INDUSTRY & REGULATIONS

Knowledge:

1. Understand & realize the significance of natural products in daily life. He/she should be able to classify different segments in market, demand & supply position; export & import potential; position of Indian herbal drug industry in global contest; government organizations& policies for promotion; their regulation in India & other countries, various regulatory guidelines, ethical issues etc.
2. Realize the market potential of natural products & explore entrepreneurship skills to grab these opportunities.
3. Understand & explain safe use of natural products, possible toxicities &interaction, toxicities in most venerable group (elderly patients), need &significance of pharmacovigilance systems; WHO guidelines in this regard.

QUALITY ASSURANCE TECHNIQUES

Knowledge:

Describe the significance of quality in pharmaceutical manufacturing

- Explain Current Good Manufacturing Practices
- Describe various aspects of documentation, SOPs and records
- Elaborate on the role of validation in assurance of quality in pharmaceutical industry
- Explain about quality by design
- Explain about ICH guidelines in stability testing and QMS

M-PHARM COURSE SUBJECTS

M-PHARM FIRST YEAR SEM I

QUALITY ASSURANCE DEPARTMENT

MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES - MPH101T / MPC 101T/ MQA101T/ MPL101T

Knowledge

1. Have knowledge about Chemicals and Excipients
2. Have understanding of the analysis of various drugs in single and combination dosage forms

3.Acquire theoretical and practical skills of the instruments

QUALITY MANAGEMENT SYSTEMS -MQA 102T

Knowledge

1. To understand the quality evaluation in the pharmaceutical industries
2. Impart basic knowledge about the importance of quality
3. Gain Knowledge to develop tools for quality improvement
4. To understand ISO management systems and its application in analysis of issues in quality
5. Knowledge Acquiring skills for stability testing of drug and drug substances
6. To learn statistical approaches for quality improvement

QUALITY CONTROL AND QUALITY ASSURANCE- MQA 103T

Knowledge

1. Knowledge of the cGMP aspects in a pharmaceutical industry.
2. Learn the importance of documentation.
3. Understand the scope of quality certifications applicable to Pharmaceutical industries.
4. Understand the responsibilities of QA & QC departments.

PRODUCT DEVELOPMENT AND TECHNOLOGY TRANSFER -MQA 104T

Knowledge

1. Gain knowledge & Understand the new product development process
2. Knowledge to sort out various information obtained during R&D
3. Knowledge to understand the necessary information to transfer technology from R&D to actual manufacturing
4. Knowledge to elucidate necessary information to transfer technology of existing products between various manufacturing places

PHARM QUALITY ASSURANCE I - MQA 105P

Skill

1. Acquire skills to design important documents.
2. Get skills to perform IPQC tests, FP tests.
3. Understand concepts of TQM, Six Sigma, CAPA, OOS, OOT
4. Skill to determine physical constants and phenomena for analytical and formulation development.

PHARMACEUTICS DEPARTMENT:

DRUG DELIVERY SYSTEM- MPH 102 T

Knowledge

1. The subject imparts various approches for development of novel drug delivery systems
2. The principles of selection of drug and polymer for development of delivery system
3. The subject imparts knowledge about formulation and evalution of novel drug delivery systems

MODERN PHARMACEUTICS-MPH 103T

Knowledge

1. Elements of preformulation
2. Active pharmaceutical ingredients and generic drug product development
3. Industrial management and GMP consideration
4. Optimization techniques and pilot plant scale up techniques
5. Knowledge to Develop Leadership qualities and essentials
6. Stability testing, sterilization process & packaging of dosage forms

REGULATORY AFFAIRS- MPH 104T

Knowledge

1. Knowledge to understand concept of innovator &generic drugs, drug development process
2. Knowledge of regulatory guidance & guidelines for filing & approval process
3. Knowledge for preparation of Dossiers and their submission to regulatory agencies in different countries
4. Knowledge for post approval regulatory requirement for actives & drug product
5. To impart knowledge submission of global documents in CTD/ECTD Formats
6. To understand knowledge of clinical trial requirement for approvals for conducting clinical trials
7. Knowledge to gain pharmacovigilance & process of monitoring in clinical trial

PHARMACEUTICS PRACTICAL I (PRACTICAL)- MPH 105P

Skill

1. Understand formulation of microspheres, liposomes
2. Understand improving dissolution and dissolution study
3. Understanding pharmacokinetics and bioavailability
4. Understanding of quality by design
5. Formulation of kinetics

PHARMACOLOGY DEPARTMENT:

ADVANCED PHARMACOLOGY-MPL 102T

Knowledge

1. The Neurotransmitters involved in the autonomic nervous system, there Synthesis and Metabolism.
2. Various adrenoreceptors and cholinoceptor, their subtypes and the clinical spectrum of their general and selective agonist and antagonist.
3. The agents that stimulate or relax skeletal muscle, including the cholinergic neuromuscular agonists and antagonists as well as the neuromuscular agents
4. acting at noncholinergic sites.
5. The essential pharmacotherapy and pharmacological features of common and important drugs used in cardiovascular diseases and respiratory disorders.
6. The guidelines for animal experimentations. Various routes of drug administration, methods for blood collection from experimental animals.
7. Composition of physiological salt solutions and basic instruments used in experimental pharmacology.
8. Performance of isolated experiments using various isolated preparation and the effects of different drugs on the concentration response curves.
9. Study the action of various drugs using preclinical models/ computer simulations.

PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-I- MPL103T

Knowledge

1 At completion of this course it is expected that students will be able to evaluate the regulations and ethical requirement for the usage of experimental animals
2. At completion of this course it is expected that students will be able to describe the various animals and techniques used in the drug discovery
3. At completion of this course it is expected that students will be able to understand process and good laboratory practices in maintenance and handling of experimental animals
4. At completion of this course it is expected that students will be able to describe the various newer screening methods involved in the drug discovery process.
5. At completion of this course it is expected that students will be able to correlate or extrapolate the invitro data to preclinical and preclinical to humans

CELLULAR AND MOLECULAR PHARMACOLOGY- MPL 104 T

Knowledge

1. Gained knowledge on the Receptor signal transduction processes in detail
2. Developed an understanding about the various molecular pathways affected by drugs
3. Gained insight into the application molecular pharmacology and biomarkers in drug discovery process
4. Capability to choose appropriate molecular biology techniques for specific pharmacology research

PHARMACOLOGY PRACTICAL- I- MPL 105P

Skill

1. Skill to perform animal handling, drug administered, surgical and euthanasia techniques, practice experimentation on laboratory animals
2. Skill to perform various preclinical models for animal experimentation for drug discovery
3. Skill to use various softwares and techniques for data analysis
4. Skill to analyze and estimate the biological sample by HPLC,UV, Flame photometry or other modern analytical tools
5. Skill to develop qualities of critical thinking, problem solving, planning ability, sincerity, time management, use of appropriate method and professional identity in preclinical drug discovery research

PHARMACEUTICAL CHEMISTRY DEPARTMENT:

ADVANCED ORGANIC CHEMISTRY I -MPC102T

Knowledge

1. The principles and applications of retrosynthesis
2. The mechanism & applications of various named reactions
3. The concept of disconnection to develop synthetic routes for small target molecule.
4. The various catalysts used in organic reactions
5. The chemistry of heterocyclic compounds

ADVANCED MEDICINAL CHEMISTRY THEORY- MPC103T

Knowledge

1. At completion of this course it is expected that students will be able to Understand-drug discovery protocol.
2. At completion of this course it is expected that students will be able to Understand Different stages of drug discovery
3. At completion of this course it is expected that students will be able to Understand Role of medicinal chemistry in drug research
4. At completion of this course it is expected that students will be able to Understand Different techniques for drug discovery
5. At completion of this course it is expected that students will be able to Understand Various strategies to design and develop new drug like molecules for biological targets
6. At completion of this course it is expected that students will be able to Understand Peptidomimetics

CHEMISTRY OF NATURAL PRODUCTS- MPC104T

Knowledge

1. After completion of course, the subject knowledge will be helpful to provide detail knowledge about chemistry of medicinal compounds from natural origin and general methods of structural elucidation of such compounds.
2. After completion of course student is able to know Different types of natural compounds and their chemistry and medicinal importance
3. After completion of course student is able to the importance of natural compounds as lead molecules for new drug discovery
4. After completion of course student is able to he concept of rDNA technology tool for new drug discovery

5 After completion of course student is able to General methods of structural elucidation of compounds of natural origin

6 After completion of course student is Able to do Isolation, purification and characterization of simple chemical constituents from natural source

ADVANCED MEDICINAL CHEMISTRY- MPC105P

Skill

1. After completion of course student is Able to know about chemicals and excipients.
2. After completion of course student is Able to know about The analysis of various drugs in single and combination dosage forms
3. After completion of course student is Able to know about Theoretical and practical skills of the instruments
4. After completion of course student is Able to know about Knowledge to develop an attitude of concern for the industry environment
5. After completion of course student is Able to know about Knowledge to ensure safety standards in pharmaceutical industry
6. After completion of course student is Able to Acquire knowledge to provide comprehensive knowledge on the safety management
7. After completion of course student is Able to know about Knowledge to empower an idea to clear mechanism and management in different kinds of hazard management system
8. After completion of course student is Able to know about acquire the knowledge for to teach the method of hazard assessment, procedure, methodology for provide safe industrial atmosphere

M-PHARM SEM II

(QUALITY ASSURANCE DEPARTMENT)

HAZARDS AND SAFETY MANAGEMENT - MQA201T

Knowledge

1. Knowledge to understand about environmental problems among learner
2. Knowledge to impart balance knowledge about environment and its allied problem
3. Knowledge to develop an attitude of concern for the industry environment
4. Knowledge to ensure safety standards in pharmaceutical industry
5. Acquire knowledge to provide comprehsive knowledge on the safety management
6. Knowledge to empower an idea to clear mechanism and management in different kinds of hazard management system
7. Knowledge for to teach the method of hazard assesment,procedure,methodology for provide safe industrial atmosphere

PHARM. VALIDATION- MQA 202T

Knowledge

1. Understand the concepts of calibration, qualification and validation
2. Understand Process validation of different dosage forms
3. Have skill to qualify of various equipments and instruments
4. Acquire skill of Validation of analytical method for estimation of drugs, Cleaning validation of equipments

AUDITS AND REGULATORY COMPLIANCE- MQA 203T

Knowledge

1. To understand the importance of auditing
2. To understand the methodology of auditing
3. Gain Knowledge to carry out the audit process
4. To learn how to prepare an audit report
5. Gain knowledge to prepare checklist for auditing

PHARMACEUTICAL MANUFACTURING TECHNOLOGY- MQA 204T

Knowledge

1. The common practice in the pharmaceutical industry developments, plant layout and production planning
2. Will be familiar with the principles and practices of aseptic process technology, non sterile manufacturing technology and packaging technology.
3. Have a better understanding of principles and implementation of Quality by design (QbD) and process analytical technology (PAT) in pharmaceutical manufacturing

PHARM QUALITY ASSURANCE II -205P

Skill

1. Acquire skills to design important documents like checklists
2. Get skills to perform analysis of actives and contaminants
3. Understand concepts of QbD, PAT
4. Skill to qualify equipments.

PHARMACEUTIC DEPARTMENT

MOLECULAR PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)- MPH 201T

Knowledge

1. The various approaches for development of novel drug delivery systems.
2. The criteria for selection of drugs and polymers for the development of NTDS
3. The formulation and evaluation of novel drug delivery systems

ADVANCED BIOPHARMACEUTICS AND PHARMACOKINETICS -MPH 202T

Knowledge

1.Understand the basic concepts of biopharmaceutics and pharmacokinetics
2.Learn to use raw data and derive pharmacokinetic models
3.To understand bioequivalence studies
4.To understand design and evaluation of dosage regimen
5.To understand pharmacokinetic problems and application of pharmacokinetics

COMPUTER AIDED DRUG DEVELOPMENT MPH203T

Knowledge

1. History of computers in pharmaceutical research and development
2. Computational modelling of drug disposition
3. Computers in preclinical development
4. Optimization techniques in formulation development
5. Computer in market analysis
6. Computers in clinical development
7. Artificial intelligence and robotics
8. Computational fluid dynamics

COSMETICS AND COSMECEUTICALS MPH 204 T

Knowledge

1. Key ingredients in cosmetics and cosmeceuticals
2. Key building blocks for formulations
3. Current technologies in market
4. Various key ingredients and basic science to develop cosmetics and cosmeceuticals.
5. Scientific knowledge to develop cosmetics and cosmeceuticals with desired safety, stability and efficacy

PHARMACEUTICS PRACTICAL II -205P

Skill

1. Understanding of important analytical methods UV, HPLC, GC
2. Formulation of novel drug delivery systems
3. Understanding Physics of tableting
4. Understanding of preformulation of tablet
5. To study kinetics of dissolution

PHARMACOLOGY DEPARTMENT:

ADVANCED PHARMACOLOGY-II-MPL201T

Knowledge

1. The Neurotransmitters involved in the autonomic nervous system, there Synthesis and Metabolism.
2. Various adrenoreceptors and cholinoceptor, their subtypes and the clinical spectrum of their general and selective agonist and antagonist.
3. The agents that stimulate or relax skeletal muscle, including the cholinergic neuromuscular agonists and antagonists as well as the neuromuscular agents
4. acting at noncholinergic sites.
5. The essential pharmacotherapy and pharmacological features of common and important drugs used in cardiovascular diseases and respiratory disorders.
6. The guidelines for animal experimentations. Various routes of drug administration, methods for blood collection from experimental animals.
7. Composition of physiological salt solutions and basic instruments used in experimental pharmacology.
8. Performance of isolated experiments using various isolated preparation and the effects of different drugs on the concentration response curves.
9. Study the action of various drugs using preclinical models/ computer Simulations.

PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS-MPL202T

Knowledge

1. At completion of this course it is expected that students will be able to understand the importance of ethical and various regulatory requirements for toxicity studies.
2. At completion of this course it is expected that students will be able to explain and plan the various types of toxicity studies.
3. At completion of this course it is expected that students will be able to understand and plan of IND and Safety pharmacology studies
4 At completion of this course it is expected that students will be able to understand and plan the toxicokinetic evaluation in preclinical studies
5 At completion of this course it is expected that students will be able to understand and plan alternative methods to animal toxicity testing

PRINCIPLES OF DRUG DISCOVERY- MPL203T

Knowledge

1. Will be able to appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery
2. Will be able to explain various targets for drug discovery
3. Will be able to explain various lead seeking method and lead optimization
4. Will appreciate the importance of the role of computer aided drug design in drug discovery

CLINICAL RESEARCH AND PHARMACOVIGILANCE- MPL204T

Knowledge

1. At completion of this course it is expected that students will be able to understand the importance of ethical and regulatory requirements for conducting of clinical trials
2. At completion of this course it is expected that students will be able to explain and plan various clinical trials.
3. At completion of this course it is expected that students will be able to execute safety monitoring, reporting, and close out activities
4. At completion of this course it is expected that students will be able to explain the roles of key players involved in clinical trial and to understand the principle of pharmacovigilance
5. At completion of this course it is expected that students will be able to understand and assess new adverse drug reactions

ADVANCED PHARMACOLOGY II-MPL205P

Skill

1. The guidelines for animal experimentations. Various routes of drug administration, methods for blood collection from experimental animals.
2. Composition of physiological salt solutions and basic instruments used in experimental pharmacology.
3. Performance of isolated experiments using various isolated preparation and the effects of different drugs on the concentration response curves.
4. Study the action of various drugs using preclinical models/ computer simulations.

PHARMACEUTICAL CHEMISTRY

ADVANCED SPECTRAL ANALYSIS- MPC201T

Knowledge

1.Will be able to Interpret NMR, Mass and IR spectra of various organic compounds
2.Will be able to carry out Identification of organic compounds
3.Acquire theoretical and practical skills of the hyphenated instruments

ADVANCED ORGANIC CHEMISTRY II -MPC202T

Knowledge

1. The principles and applications of Green chemistry
2. The concept of peptide chemistry.
3. The various catalysts used in organic reactions
4. The concept of stereochemistry and asymmetric synthesis.

COMPUTER AIDED DRUG DESIGN-MPC203T

Knowledge

1. At completion of this course it is expected that students will be able to Understand Role of CADD in drug discovery
2. At completion of this course it is expected that students will be able Understand Different CADD techniques and their applications
3. At completion of this course it is expected that students will be able to Understand Various strategies to design and develop new drug like molecules.
4. At completion of this course it is expected that students will be able to Understand Working with molecular modeling softwares to design New drug molecules
5. At completion of this course it is expected that students will be able to Understand The in silico virtual screening protocols

PHARMACEUTICAL PROCESS CHEMISTRY- MPC204T

Knowledge

1. At the completion synthetic routes that are safe, cost-effective, environmentally friendly, and efficient should be developed on learning the subject.
2. At completion of this course it is expected that students will be able to understand The strategies of scale up process of apis and intermediates.
3. At completion of this course it is expected that students will be able to understand The various unit operations and various reactions in process chemistry

PHARMACEUTICAL CHEMISTRY PRACTICALS – II-MPC205P

Skill

1. After completion of course student is Able to know about chemicals and excipients.
2. After completion of course student is Able to know about The Analysis of various drugs in single and combination dosage forms
3. After completion of course student is Able to know about Theoretical and practical skills of the instruments
4. After completion of course student is Able to know about Knowledge to develop an attitude of concern for the industry environment
5. After completion of course student is Able to know about Knowledge to ensure safety standards in pharmaceutical industry
6. After completion of course student is Able to Acquire knowledge to provide comprehensive knowledge on the safety management
7. After completion of course student is Able to know about Knowledge to empower an idea to clear mechanism and management in different kinds of hazard management system
8. After completion of course student is Able to know about acquire the knowledge for to teach the method of hazard assessment, procedure, methodology for provide safe industrial atmosphere