B.PHARMACY PROGRAM OUTCOMES (PO'S)	
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.
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.
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.
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.
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.
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).
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.
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.
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.
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 sustainabledevelopment.
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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B. Pharmacy

Program Specific Outcomes

PSO1: To foster a research environment in various multidisciplinary aspects of pharmaceutical sciences involved in drug development and end product optimization.

PSO2: To accentuate the role of a pharmacist in the health care system and community well-being

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PHARM-D

PROGRAM SPECIFIC OUTCOMES (PSO's)

PSO1: Anticipate the patient's needs, participate in the creation of individualized disease management and prevention plans including patients self management and behavior changes.

PSO2: Knowledge to participate with inter professional health care team members in the management of health promotions for all patients by providing pharmaceutical care (Includes Medication therapy management/Therapeutic Drug monitoring)

PSO3: Graduates can apply their expertise to recognize possible adverse drug interaction or any side effects can also counsel the patients to comply with the prescribed treatment regimen.

PSO4: Knowledge to formulate evidence based health care plans, assessments and recommendations

PSO5: Comphrehend the role to provide health care services to patients and families with the aim of preventing related problems and to maintain the overall health.

PSO6: Assimilate and enhance the quality of care and service to patients by optimizing the ability to use critical analysis and problem solving skills for better patient outcomes.

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M. Pharm- Pharmaceutics

Programme Specific Outcomes

PSO 1: To whirl a new chemical entity into a formulation that can be used safely and effectively by the patients.

PSO 2: To expertise in technical skills and gain knowledge in bioavailability and bioequivalence studies.

PSO 3: To develop modest nanotechnological skills in the field of pharmaceutical research.

PSO 4: To impart knowledge and skill development on designing of dosage forms as per GMP guidelines.

PSO 5: Establishing potentiality in multidisciplinary chore for betterment in quality of drug delivery systems.

PSO 6: Acquire core knowledge in computer simulations and problem analysis as per regulatory requirements for the development of dosage forms.

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M. Pharmacy (Pharmaceutical Analysis)

Program Specific Outcomes

The following Program specific outcomes reflect the terminal skills that all M. Pharmacy graduates should be able to demonstrate upon program completion:

PSO 1: To learn the advanced analytical techniques for the determination of various drugs in single and combination dosage forms.

PSO 2: To operate, control, analyze and evaluate chemical substances, cosmetic products and finished products using hyphenated techniques.

PSO 3: To carry out the validation of manufacturing processes and apply the knowledge of validation to instruments and equipments.

PSO 4: To design a system, component or process to meet the desired needs within realistic constraints such as economic, environmental, sustainability social, ethical, health, safety and manufacturability for humans.

PSO 5: To understand the responsibilities of QA & QC departments like cGMP aspects, scope of quality certifications and importance of documentation.

PSO 6: To promote the development of skilled human resource in Pharmaceutical Sciences for propagation of quality education with right professional and ethical attitude, good communication skills, right mental attitude in a multidisciplinary Pharmaceutical Sciences arena

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B.PHARMACY I SEMESTER CAY 2020-2021

COURSE OUTCOMES

Year/S	Code/Sub	CO STATEMENTS
	BP101T Human Anatomy and Physiology I–Theory	On completion of the course student will able to
B. Pharmacy I Sem		C101.1 Illustrate the gross morphology, structure and functions of various organs of the human body at cell and tissue levels.
		C102.2 Identify the structures and functions of skin.
		C103.3 Discuss about the various bones and joints.
		C104.4 Categorise the various homeostatic mechanism and diseases caused by their imbalance.
		C105.5 Infer the knowledge about the gross morphology, structure and functions of nervous systems in the human body
		C106.6 Illustrate the interlinked mechanisms in the maintenance of physiology of cardiovascular system.
	BP102T Pharmaceutical Analysis I – Theory	On completion of the course student will able to
		C102.1Illustraate relevance & significance of Analytical Chemistry to Pharmaceutical sciences
		C102.2 Clarify the basic principles of data treatment and data handling.
		C102.3 Explain the basic concepts and principles of aqueous acid base titrations and clarify need of non-aqueous acid base titrations.
		C102.4 Clarify the different terms, basic principles and reaction conditions of precipitation, Complexation and redox reaction.
		C102.5 Understand and concept of electro chemical methods.
		C102.6 Utilise the concept of oxidation and reduction in redox titrations
	BP103T Pharmaceutics I – Theory	On completion of the course student will able to
B. Pharmacy I Sem		C103.1 Understand the history of Pharmacy profession
		C103.2 Infer the knowledge of handling a prescription.
		C103.3 Understanding the importance of different incompatibilities and possibilities of overcoming them
		C103.4 To know about preparation and evaluation of different dosage forms
		C103.5 Know about excipients used in different dosage forms
		C103.6 Examine the stability problems of biphasic liquid dosage forms
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B. Pharmacy I Sem	BP104T Pharmaceutical Inorganic Chemistry – Theory	On completion of the course student will able to
		C104.1 Introduce a variety of inorganic drug classes.
		C104.2 Infer about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
		C104.3 Understand principles and working procedures involved in limit tests for commonly observed impurities
		C104.4 Find different types of inorganic pharmaceuticals and their analysis
		C104.5 Identify different anions, cations and different inorganic pharmaceuticals.
		C104.6 Examine the medicinal and pharmaceutical importance of inorganic compounds
B. Pharmacy I Sem	BP105T Communication Skills - Theory	On completion of the course student will able to
		C105.1 Define communication skills and identify its significance in daily life.
		C105.2 Compare between verbal and non verbal communication.
		C105.3 Use knowledge in communication skills and soft skills to demonstrate them.
		C105.4 Apply skills to meet the requirements of an employer.
		C105.5 Design a presentation and develop presentation skills to deliver at various levels.
		C105.6 Elevate leadership qualities in essential contexts and Build up skills in order to manage the team as a team player.
	BP106RBT/ Remedial Biology **C106**	On completion of the course student will able to
		C106B.1 Understand about living world and morphology of flowering plants
		C106B.2 Infer about body fluids, digestive enzymes and respiratory system of human body
		C106B.3 Illustrate the basic components of renal system and its functions.
		C106B.4 Explain the basic components of neuronal system and its functions.
		C106B.5 Describe about plants and mineral nutritions.
		C106B.6 Understand the concept of plant respiration
Sem	BP106RMT/Remedial Mathematics	On completion of the course student will able to
		C106M.1 Develop the application skills of mathematics in pharmacy
		C106M.2 Memorize the formulae and executing them to solve the different problems by using mathematics concepts
		C106M.3 Apreciate the applications of logarithms in calculations of experiments

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B. Pharmacy I		C106M.4 Analyse and applies the concepts of mathematics in pharmacokinetics and chemical kinetics
		C106M.5 Understand the basics of mathematics which will be helpful in analysing and solving pharmaceutical calculations in the higher classes
		C106M.6 Evaluates the applications of calculus
	BP107P Human Anatomy and Physiology -Practical	On completion of the course student will able to
		C107.1 Understand the uses and application of compound microscope
		C107.2 Interpret the various tissues of human body under microscope
		C107.3 Identify the various bones of human body.
		C107.4 Infer the uses and application of hemocytometer.
		C107.5 Analyse the blood sample for blood group determination, bleeding time, clotting time, blood cells counting
		C107.6 Determine heart rate and Pulse rate, blood pressure measurement by prescribed methods
	BP108P Pharmaceutical Analysis I – Practical	On completion of the course student will able to
		C108.1 Develop the ideas with the fundamentals of analytical chemistry among the pupil.
		C108.2 Construct the fundamental methodology to prepare different strength of solutions.
		C108.3 Facilitates to predict the sources of mistakes, impurities and errors.
		C108.4 Develop the fundamentals of volumetric analytical skills
		C108.5 Speculates the basic knowledge in the principles of assays of compounds in volumetric analytical Techniques like Neutralisation, precipitation, complexometric, Non aqueous and Redox Titration methods.
		C108.6 Understands the basic principles involved in Electro chemical methods.
	BP109P Pharmaceutics I – Practical	On completion of the course student will able to
B. Pharmacy I Sem		C109.1 Preparation of different dosage forms as per prescibed formulae and methods.
		C109.2 Formulations of biphasic liquid dosage forms
		C109.3 Discuss and perform the preparation, sieving and packing of powders
		C109.4 Develop various types of emulsions.
		C109.5 Preparation and evaluation of suppositories.
		C109.6 Preparation and evaluation of ointments.

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B. Pharmacy I Sem	BP110P Pharmaceutical Inorganic Chemistry – practical	On completion of the course student will able to
		C110.1 Understand the preparation and purification of different inorganic compounds and compare their properties.
		C110.2 Analyse heavy metals by limit test and apply them in different pharmaceutical substance.
		C110.3 Analyse normality, molarity and can report them.
		C110.4 Evaluate purity of samples using various analytical techniques.
		C110.5 Explain concepts related to awareness of hazards and their precautionary measures.
		C110.6 Apply practical skills acquired in quantitative analysis for future analysis of medicinal compounds.
B. Pharmacy I Sem	BP111P Communication skills – Practical	On completion of the course student will able to
		C111.1 Apply communication skill to communicate verbally and non verbally
		C111.2 Explain direct and indirect speech
		C111.3 Apply figures of speech in writing effectively
		C111.4 Develop interview skills
		C111.5 Remember etiquettes while composing an email
		C111.6 Design, structure and plan a presentation
	BP112RBP Remedial Biology – Practical	On completion of the course student will able to
		C112.1 Understand the uses and application of compound microscope and cell structure
		C112.2 Explain the different types of parts of plants and study about frog
		C112.3 Examine the various tissues of plants under microscope.
		C112.4 Identify the different type of bones in human body
		C112.5 Evaluate the blood sample for blood group determination.
		C112.6 Determine blood pressure and tidal volume.

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B.PHARMACY II SEMESTER CAY 2020-2021

COURSE OUTCOMES

Code/Sub	CO STATEMENTS
BP201T/HAP-II	On completion of the course student will able to
	C201.1 Understand gross morphology, structure and functions of nervous system in the human body.
	C201.2 Discuss in detail about energy and digestive system.
	C201.3 Explain about the anatomy and physiology of respiratory system.
	C201.4 Illustrate about the anatomy and physiology of urinary system.
	C201.5 Describe in detail about various glands and hormones.
	C201.6 Infer about the anatomy and physiology of reproductive system and genetics in the human body.
	On completion of the course student will able to
BP202T Pharmaceutical Organic Chemistry I – Theory	C202.1 Understand the structure and name of the various classes of organic compounds.
	C202.2 Identify the different types of isomerism.
	C202.3 Examine and write the reaction, name the reaction and orientation of reactions.
	C202.4 Evaluate reactivity/stability of unsaturated hydrocarbons.
	C202.5 Interpret or confirm the presence of organic compounds.
	C202.6 Infer the named reactions of carbonyl compounds and describe them.
	On completion of the course student will able to
	C203.1 Examine the biological role of carbohydrate, lipids ,amino acids and protein
	C203.2 Discuss the role of enzymes involved in metabolic process of carbohydrate, protein, amino acids by animal models

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BP203T Biochemistry – Theory	C203.3 Infer the importance of Macro and Micronutrients in the regulation of normal Biochemical pathways
	C203.4 Calculate the blood sugar level by appropriate biochemical method
	C203.5 Identify carbohydrate, protein, lipids in urine, plasma and their clinical significance
	C203.6 Describe the abnormal constituents in urine and their disease diagnosis with respective level of enzyme.
BP204T Pathophysiology – Theory	On completion of the course student will able to
	C204.1 Describe the basic principles of cell injury and mechanism involved in the process of inflammation.
	C204.2 Infer the concept of pathophysiology, clinical presentation of the cardiovascular, respiratory and renal diseases
	C204.3 Understand the pathophysiology and clinical presentation of the haematological and endocrine disorders.
	C204.4 Discuss about the pathophysiology and clinical presentation of the nervous and gastrointestinal diseases.
	C204.5 Explain the etiology, pathogenesis, clinical presentation and complication of hepatic, joint disease and cancer disease.
	C204.6 Discuss about the etiology, pathogenesis, clinical presentation and complication of infection disease like meningitis, Tuberculosis, Sexually transmitted disease.
BP205T Computer Applications in Pharmacy – Theory **C118**	On completion of the course student will able to
	C205.1 Identify the number systems, its conversion and calculations, the concept of the information systems and softwares used in different field and its processes.
	C205.2 Understand the various types of application of computers in pharmacy
	C205.3 Infer the various web technologies, the different databases and various applications of databases in pharmacy
	C205.4 Discuss the Bioinformatics Databases, Concept and Impact of Bioinformatics in Vaccine Discovery.
	C205.5 Describe the application of Computers as data analysis in Preclinical development like CDS, LIMS, TIMS etc
	C205.6 Compare different types of Web technologies

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BP206T Environmental sciences – Theory	On completion of the course student will able to
	C206.1 Understand the basics of natural resources
	C206.2 Understand about forest resources, water resources,& mineral resources
	C206.3 Explain about all types of ecosystems
	C206.4 Describes air pollution
	C206.5 Discuss about soil pollution
	C206.6 Describe about water pollution
BP207P Human Anatomy and Physiology II –Practical	On completion of the course student will able to
	C207.1 Illustrate the integumentary, nervous and endocrine system
	C207.2 Analyse sense organ parameters by performing the experiments like Olfaction, gustation reflex and eye sight
	C207.3 Evaluate pulmonary function and body temperature by performing experiments like pulmonary function tests, body temperature measurement
	C207.4 Use charts and specimens to learn about various systems in human body.
	C207.5 Identify different types of family planning devices and perform the pregnancy diagnosis test
	C207.6 Determination of BMI, blood count and learn vital organs and gonads.
BP208P Pharmaceutical Organic Chemistry I– Practical	On completion of the course student will able to
	C208.1 To understand the basic principles and qualitative analysis with respect to preliminary tests
	C208.2 Determination of elements like sulphur,nitrogen, and halogen present in organic compounds by lassaigne's test
	C208.3 Further identification of organic samples using solubility parameters
	C208.4 Confirmation of given organic samples by functional group analysis, melting point & boiling point detection.
	C208.5 Preparation of suitable solid derivatives by applying theoritical knowledge and reaction setup
	C208.6 Practical Construction of molecular models of various organic compounds

BP209P Biochemistry – Practical	On completion of the course student will able to
	C209.1 Analyse qualitative and quantitative test to know the normal costituents in Blood and Urine
	C209.2 Calculate glucose levels in Blood to identify Diabetes mellitus
	C209.3 Identify factors affecting Enzyme activity
	C209.4 Correlate the results obtained from quantitative experiments with that of normal biochemical values
	C209.5 Examine cholesterol in the blood
	C209.6 Understand the role of electrolytes present in body and determines electrolytes by using tests, applying the knowledge to perform diagnostic test and understand the reason for particular disease
BP210P Computer Applications in Pharmacy – Practical	On completion of the course student will able to
	C210.1 Explain Ms-Word,Ms-Acess and applications of databases in pharmacy
	C210.2 Apply Word Proceesing, Design a questionnaire-generating label in MS WORD
	C210.3 Use MS-Access, Creating Table,Forms,Query,Generating Reports-
	C210.4 Find methods of Exporting Tables, Queries, Forms and Reports to web pages
	C210.5 Usage of HTML-Creating Webpages infer various types of applications of computers in pharmacy by using internet
	C210.6 Apply online tools: Will gain Knowledge retrieve the information of a drug and its adverse effects etc.

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B.PHARMACY III SEMESTER CAY 2020-2021

COURSE OUTCOMES

Code/Sub	CO STATEMENTS
BP301T Pharmaceutical Organic Chemistry II – Theory	On completion of the course student will able to
	C301.1 Understand the core principles and reaction mechanisms for benzene and their derivatives.
	C301.2 Compare the relative stabilities and chemical reactions of cycloalkanes.
	C301.3 Identify the principles and mechanisms of aromatic substitution reactions.
	C301.4 Infer the concept behind the aromaticity of Benzene and describe uses of polynuclear aromatic hydrocarbons.
	C301.5 Explain the synthesis, reactions and medicinal uses of polynuclear aromatic hydrocarbons.
	C301 6 Interpret the chemistry, chemical reactions and analytical constant of fats and oils.
BP302TPhysical Pharmaceutics I – Theory	On completion of the course student will able to
	C302.1 Describe the concepts of physicochemical properties of drugs.
	C302.2 Understand the concepts in designing dosage forms.
	C302.3 Evaluate and select a suitable surfactant blend based on HLB scale.
	C302.4 Discusss the fundamental concepts of pH, buffers and isotonic solutions and learns to apply them.
	C302.5 Infer pharmaceutical applications of complexation and Understand the concepts of absorption and adsorption.
	C302.6 Explain the principles of surface tension and interfacial phenomena
BP303TPharmaceutical Microbiology – Theory	On completion of the course student will able to
	C303.1 Define microbiology, classification, uses of microbes, historical developments, in pharmacy and contributions of scientists in the field of microbiology and the recent advances.
	C303.2 Compare various structural features, biology & characteristics of microbes, able to know the modes of reproduction in bacteria, growth characteristics, requirements and describe isolation & counting methods of microorganisms.
	C303.3 Know the sources & types of microbial contamination and able to identify the causes and basis of microbial spoilage.
	C303.4 Explain an importance of microbial limit tests, preservative efficacy test...
	C303.5 Study of disinfectants ans sterility testing of various pharmaceutical products
	C303.6 Discuss various procedures for cell culture, types of cell culture and their applications in pharmaceutical industry and research

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BP304TPharmaceutical Engineering – Theory	On completion of the course student will able to
	C304.1 Describe various operations involved in pharma industries
	C304.2 Infer concept behind material handling system
	C304.3 Examine the concepts of various heat involved process
	C304.4 Identify various important manufacturing processes
	C304.5 Apply the concepts behind selection of suitable technique for improving characters of dosage forms.
	C304.6 Discuss about the precautions to be taken in hazardous conditions.
BP305P Pharmaceutical Organic Chemistry II – Practical	On completion of the course student will able to
	C305.1 Apply recrystallization techniques to purify the compounds and selection of solvents based on trial and error methods.
	C305.2 Analyse various analytical constants of oils and fats.
	C305.3 Understand various basic principles and reaction mechanisms involved in the preparation of organic compounds.
	C305.4 Explain the principles involved in reaction mechanism
	C305.5 Examine the physico chemical properties of the organic compounds.
	C305.6 Infer the importance of reflux condenser in synthesis of organic compounds
BP306P Physical Pharmaceutics I – Practical	On completion of the course student will able to
	C306.1 Discuss and determine the distribution coefficient of liquids
	C306.2 Calculate the surface tension of liquids by drop weight and drop count method.
	C306.3 Interpret suitable surfactant and to test CMC of a surfactant by saponification method.
	C306.4 Construct the phase diagrams and discuss solubility of drugs in various solvents.
	C306.5 Evaluate the pka value by half neutralization method.
	C306.6 Analyse the stability constant and donor acceptor ratio by solubility method.

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BP307P Pharmaceutical Microbiology – Practical **C207**	On completion of the course student will able to
	C307.1 Know the principle, construction and working of various instruments and perform their operations and Skill to handle microscope for observation of microbes.
	C307.2 Learn how to prepare and sterilize nutrient broth, nutrient agar, slants, stabs and plates and adopt the skills required for maintaining strictly aseptic condition & handling inoculating loop, its sterilization and inoculation procedure.
	C307.3 Develop Skill of Isolating microorganism by streak plate technique & count them by pour plate technique.
	C307.4 Develop skill to know morphology of bacteria by simple staining & gram staining
	C307.5 Understand the direct inoculation method to do sterility testing of WFI
BP 308P Pharmaceutical Engineering –Practical	On completion of the course student will able to
	C308.1 Applying methods in conducting of certain unit operations.
	C308.2 Evaluate the role of radiation in flow of heat.
	C308.3 Evaluate the role of particle size in pharmaceutical industries.
	C308.4 Application of heat in drying process.
	C308.5 Understand the role of size reduction equipment and its application
	C308.6 Understand in improving the characteristics of pharmaceutical preparations.

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B.PHARMACY IV SEMESTER CAY 2020-2021

COURSE OUTCOMES

Year/Sem	Code/Sub	CO STATEMENTS
	BP401T Pharmaceutical Organic Chemistry III– Theory	On completion of the course student will able to
B. Pharmacy IV Sem		C401.1 Understand the basic principles of heterocyclic chemistry.
		C401.2 Draw the structures and synthesize simple pharmaceutically active organic compounds having five and six membered heterocyclic compounds.
		C401.3 Infer detailed mechanisms for common name reactions.
		C401.4 Apply experimental techniques, procedures and safe laboratory practices with the application of theoritical knowledge
		C401.5 Identify Stereo-chemical features of drug molecules i.e optical geometric isomers
		C401.6 Apply the knowledge of medicinal value of heterocyclics in choosing pharmacophore design.
	BP402T Medicinal Chemistry I – Theory	On completion of the course student will able to
B. Pharmacy IV Sem		C402.1 Examine the relationship between various physicochemical properties of the drugs to their biological activity
		C402.2 Explain the significance of various biologically active scaffolds and their relation to biological activity.
		C402.3Infer the synthetic schemes and reactions involved in the synthesis of various drugs.
		C402.4 Understand the concept of SAR and mechanism of action of various classes of drugs acting on ANS and CNS.
		C402.5 Apply the medicinal chemistry knowledge of various classes of drugs for Drug design
		C402.6 Identify structures of various antidotes in drug poisoning and their implications
	BP403 TPhysical Pharmaceutics II – Theory	On completion of the course student will able to
B. Pharmacy IV Sem		C403.1 Describe the types of colloids and their characteristics.
		C403.2 Infer the rheological properties and order of reaction
		C403.3 Describe the concepts of physicochemical properties of drugs and understand their importance in designing dosage formulation.
		C403.4 Compare the concepts and properties of suspensions and emulsions.
		C403.5 Evaluate the suitable method to determine the particle size of powders.
		C403.6 Understand the principles of chemical kinetics and utilize them for stability testing and to interpret the expiry date of formulations.

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B. Pharmacy IV Sem	BP404TPharmacology I – Theory	On completion of the course student will able to
		C404.1 Understand the basic concepts of Pharmacology like mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics)
		C404.2 Explain the principles and mechanisms of drug action at receptor levels (Pharmacodynamics).
		C404.3 Describe about the drug adverse effects, clinical uses,drug interactions and drug discovery.
		C404.4 Discuss the Pharmacological action, uses, adverse ffects, interactions and mechanism actions of drugs acting on Peripheral nervous system and on their related disorders.
		C404.5 Understand the Pharmacological action, uses, adverse effects, interactions and mechanism action of drugs acting on Central nervous system and on their associated disorders.
		C404.6 Describe about the Pharmacological action, uses, adverse ffects, interactions and mechanism action of Psychopharmacological agents related drugs and disease.
B. Pharmacy IV Sem	BP405 TPharmacognosy and Phytochemistry I– Theory	On completion of the course student will able to
		C405.1 Understand fundamentals of Pharmacognosy including its history, scope and development, classifies crude drugs and learn their applications.
		C405.2 Discuss different cultivation, collection, storage and processing methods of crude drugs and memorises marine drugs.
		C405.3 Evaluate the importance of various techniques in Quality control of natural drugs.
		C405.4 Infers classification, definition, properties, source, chemical nature and therapeutic uses of secondary metabolites like glycosides, tannins, volatile oils, alkaloids, flavonoids, resins and other natural substances like plant fibres, hallucinogens and their application in various therapeutic indications as natural medicine and learns their application.
		C405.5 Analyse importance of basic knowledge in traditional systems of medicines namely siddha, ayurveda, unani, homeopathy and chinese system of medicine.
		C405.6 Identify introduction, Source, method of preparation, storage and therapeutic uses of primary metabolites like carbohydrates, lipids, proteins and enzymes and learns their application.
B. Pharmacy IV Sem	BP406P Medicinal Chemistry I – Practical	On completion of the course student will able to
		C406.1 Calculate the partition coefficient values of various medicinal compounds and correlation with the biological activity.
		C406.2 Understand the basic principles and reaction mechanisms involved in the synthesis of drugs.
		C406.3 Calculate the amount of active pharmaceutical ingredient present in the dosage form.
		C406.4 Apply purification techniques like recrystallisation, reflux condensation and vaccum filtration.
		C406.5 Design the scheme involved in the synthesis of intermediates.

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B. Pharmacy IV Sem	BP407P Physical Pharmaceutics II – Practical	On completion of the course student will able to
		C407.1 Understand the pre formulation parameters-bulk density,true density and porosity of powders and working of brookfield viscometer
		C407.2 Examine the flow properties of powders by angle of repose, carrs consolidation index and hausner's ration.
		C407.3 Identify the particle size distribution by sieving and microscopy method.
		C407.4 Analyse the stability by carrying out accelerated stability studies Interpret a suitable suspending agent based on sedimentation volume.
		C407.5 Calculate the viscosity of liquids by ostwalds viscometer and viscosity of semisolids by brookfield viscometer.
		C407.6 Find out reaction rate constant of first and second order constant by acid and alkaline hydrolysis.
	BP408P Pharmacology II– Practical	On completion of the course student will able to
		C408.1 Learn the working of various equipments used in pharmacology.
		C408.2 Infer about the maintenance of animal laboratory according CPCSEA Guidelines.
		C408.3 Describe the methods of blood withdrawal, various drug administrations to various types of animals.
		C408.4 Apply simulated experiments to understand isolation of different organs/tissues from the laboratory animals.
		C408.5 Use simulated experiments to interpret the effect of drugs on animals.
		C408.6 Explain the various receptor actions using isolated tissue preparation
B. Pharmacy IV Sem	BP409P Pharmacognosy and Phytochemistry I – Practical	On completion of the course student will able to
		C409.1 Understand the chemical identification some crude drugs by performing specific chemical test.
		C409.2 Calculate microscopically size of starch grains, fibres and calcium oxalate crystals by using eye piece micrometer.
		C409.3 Identify qualitative evaluation of physical parameters of crude drugs like moisture content, ash value and extractive value.
		C409.4 Apply microscopic determination for evaluation of vein islet number, vein termination, paliside ratio, stomatal number and index of crude drugs.
		C409.5 Analyses the starch grains number using lycopodium spore method.
		C409.6 Evaluate foaming and swelling index of crude drugs.

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B.PHARMACY V SEMESTER CAY 2020-2021

COURSE OUTCOMES

Code/Sub	CO STATEMENTS
BP501T Medicinal Chemistry II – Theory	On completion of the course student will able to
	C501.1 Understand the chemical classification, structures and able to interpret IUPAC name and synthesis of all category of drugs.
	C501.2 Interpret the molecular level mechanism of action in correlation with chemical structure and synthesis of medicinal compounds
	C501.3 Analyse correlation between chemical structure and biological activity of the drugs
	C501.4 Infer the knowledge of the physiology of GIT and drugs acting GI ailments
	C501.5 Understand the various classes of drugs acting on cardiovascular system.
	C501.6 Apply the knowledge of hormones of endocrine system and Describe drugs acting on metabolic disorders.
BP502T Industrial PharmacyI– Theory	On completion of the course student will able to
	C502.1 Interpret preformulation studies and its application in development of different dosage forms.
	C502.2 Understand the methods of preparation and evaluation of solid dosage forms.
	C502.3 Infer importance of parenterals and aerosols,evaluation of its efficacy.
	C502.4 Compare the methods of preparation, analysis and evaluation of different cosmetics.
	C502.5 Apply the concept in selection of suitable packaging material for pharmaceutical products.
BP503T Pharmacology II – Theory	On completion of the course student will able to
	C503.1 Discuss the Pharmacological action, uses, adverse effects, interactions and mechanism action of drugs acting on Cardiovasular system and on their related disease.
	C503.2 Understand the Pharmacological action, uses, adverse effects, interactions and mechanism action of drugs acting on blood clot and on their related disease.
	C503.3 Explain the Pharmacological action, uses, adverse effects, interactions and mechanism action of drugs acting on Urinary system and related disease.
	C503.4 Understand Pharmacological action, uses, adverse effects, interactions and mechanism action of autocoids and related drugs, related disease
	C503.5 Describe about the Pharmacological action, uses, adverse effects, interactions and mechanism action of drugs acting on endocrine system and related disease.
	C503.6 Infer about concept of steroids, drug acting on the uterus and basic knowledge about bioassay

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BP504T Pharmacognosy and Phytochemistry II– Theory	On completion of the course student will able to
	C504.1 Draws various steps involved in plant biosythetic techniques for production of various primary and secondary metabolites and Understand basic metabolic pathways in higher plants
	C504.2 Infers introduction, chemistry and describes therapeutic applications of secondary metabolites such as alkaloids, flavonoids, glycosides, volatile oils, resins.
	C504.3 Analyse correlation between chemical structure and biological activity of the drugs
	C504.4 Discuss isolation, identification and analysis of some important phytoconstituents and various modern methods of extraction of crude drugs.
	C504.5 Describes industrial production and devices estimation and utilization of some phytoconstituents.
	C504.6 Learns importance and application of latest techniques namely spectroscopy, chromatography and electrophoresis in isoltion,purification and identification of crude drugs.
BP505T Pharmaceutical Jurisprudence – Theory	On completion of the course student will able to
	C505.1 Understand detailed study of various rules and regulations of import, manufacture and conditions for grant of license for manufacture of different categories of drugs and describes Schedules to act and rules of Drugs and Cosmetics Act 1940 and its rules 1945 in India.
	C505.2 Infers detailed study of various schedules of the D & C act, discuss rules and regulations of packing, labelling and sale drugs and explains adminstration of Drugs and Cosmetics Act 1940 and its rules 1945 in India
	C505.3Identify the importance of application of Pharmacy act 1948 for pharmacy education regulations and registration as pharmacist in india
	C505.4 Describes the role of Medicinal and toilet preparations act 1955 and Narcotic Drugs and Psychotropic substances Act-1985 and Rules in india to control misuse of alcohol and prevent drug addiction respectively.
	C505.5 Categorise the prohibited advertisements as per drugs and magic remedies (objectionable advertisements) Act 1954, infers regulation of prevention of cruelty to animals act 1960.
	C505.6 Analyse the evolution of Drug legislation in India and importance of other acts like Medical Termination of Pregnancy Act, Right to Information Act and Intellectual Property Rights (IPR) and describescode of Pharmaceutical ethics and Pharmacist oath.
BP506P Industrial PharmacyI – Practical	On completion of the course student will able to
	C506.1 Analyze different preformulation studies for various drugs.
	C506.2 Prepare different solid dosage forms and evaluate their quality parameters.
	C506.3 Apply the concept of coating process for granule and tablets.
	C506.4 Prepare and analyze the quality of different parenteral dosage forms.
	C506.5 Prepare and evaluate semi solid dosage forms.
	C506.6 Describe the different packaging materials for dosage forms.

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BP507P Pharmacology II – Practical	On completion of the course student will able to
	C507.1 Learn about in-vitro pharmacological experiments and equipments used in pharmacology.
	C507.2 Describe about monitoring of blood pressure and heart rate to various types of animals.
	C507.3 Perform bioassay of drug like histamines, oxytocin, serotonin and acetylcholine.
	C507.4 Understand determination of $PA_2$and PD_2 value of drugs.
	C507.5 Use simulated experiments.to understand isolation of different organs/tissues from the laboratory animals.
	C507.6 Apply simulated experiments to interpret the effect of drugs on animals.
BP508P Pharmacognosy and Phytochemistry II – Practical	On completion of the course student will able to
	C508.1 Analyses transverse sections and powdered samples of some important crude drugs and describes its microscopic characteristics.
	C508.2 Describe morphology and carries out extraction and detection of some important crude drugs.
	C508.3 Infers and performs isolation active principles from respective natural sources and detects them.
	C508.4 Apply paper chromatography for seperation of sugars and develope TLC of herbal extract for detection of phyto constituemts
	C508.5 Evaluate TLC for detection of phytoconstituents Perform distillation of volatile oils.
	C508.6 Analyse some crude drugs for chemical identification by performing chemical tests.

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B.PHARMACY VI SEMESTER CAY 2020-2021

COURSE OUTCOMES

Code/Sub	CO STATEMENTS
BP601T Medicinal Chemistry III – Theory	On completion of the course student will able to
	C601.1 Categorise medicinal compounds into different classes and interpret IUPAC names along with mechanism of action of drugs or the class to which they belongs .
	C601.2 Apply scientific knowledge about relationship between biological activity and structure of various chemotherapeutic agents and antibiotics
	C601.3 Infer the synthetic route for selective medicinal compounds along with their stereochemical aspects,stability and related issues.
	C601.4 Describe various concepts of drug design, QSAR studies and combinotorial chemistry
	C601.5 Understand the mechanism of action, metabolism and therapeutic value and adverse reactions of drugs.
	C601.6 Examine the pharmacophore modelling and docking techniques in discovering drugs.
BP602T Pharmacology III – Theory	On completion of the course student will able to
	C602.1 Understand the pharmacological action and mechanism of action of drug at macromolecular level acting on respiratory system and apply the knowledge in understanding the prevention and treatment of its related diseases.
	C602.2 Discuss the pharmacological action and mechanism of action of drug at macromolecular level acting on gastrointestinal system and apply the knowledge in understanding the prevention and treatment of its related diseases.
	C602.3 Explain the basic principles about Chemotherapy
	C602.4 Describes the basic principle, pharmacological action and mechanism of action of Chemotherapy of various infectious disease
	C602.5 Discuss Chemotherapy of sexually transmitted infection disease and Immune-pharmacology
	C602.6 Understand the basic principles of toxicology and treatment of poisoning.
BP603T Herbal Drug Technology – Theory	On completion of the course student will able to
	C603.1 Understand basics of herbs, herbal medicine, processing of herbal materials and Identify importance of biodynamic agriculture, good agricultural practices
	C603.2 Analyse importance of basic knowledge in traditional systems of medicines namely siddha, ayurveda etc, including preparation and standardisation of ayurvedic formulations like aristas,asawas.
	C603.3 Infer importance of nutraceuticals in various ailments and descibes herb-drug, herb-food interactions.
	C603.4 Describe herbal excipients and basics, preparation of herbal cosmetics, conventional herbal formulations and novel dosage forms.
	C603.5 Explains WHO, ICH guidelines for evaluation and stability testing of herbal drugs, patenting and regulatory requirements of natural products.

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	C603.6 Summarise schedule - T good manufacturing practices of indian system of medicine and general introduction to herbal industry.
BP604T Biopharmaceutics and Pharmacokinetics –Theory	On completion of the course student will able to
	C604.1 Understand the concept of biopharmaceutics and pharmacokinetics
	C604.2 Compare the renal and non renal route of excretion
	C604.3 Identify concepts of bioavailability and bioequivalence of drug products and its significance
	C604.4 Calculate pharmacokinetics parameters from plasma drug concentration profile
	C604.5 Infer the significance of protein drug binding
	C604.6 Evaluate ADME factors from kinetic data
BP605T Pharmaceutical Biotechnology – Theory	On completion of the course student will able to
	C605.1 Understand the principles of genetic engineering and protein engineering
	C605.2 Infer knowledge of cloning,rDNA technology & PCR
	C605.3 Discuss different methods in immunology, hybridoma technology, and blood products.
	C605.4 Describes some immuno blotting tests, microbial genetics and mutations
	C605.5 Examine various techniques to produce enzymesin biotechnology, use of enzymes in fermentation
	C605.6 Explain the production of antibiotics, vitamins and blood products
BP606T Quality Assurance –Theory	On completion of the course student will able to
	C606.1 Define the responsibilities of QA and QC departments
	C606.2 Understand the concept of quality management, evaluate the process of quality audit and review
	C606.3 Distinguish among the cGMP and GLP aspects in relevance to pharmaceutical industry
	C606.4 Interpret the process pertaining to various aspects of documentation organize validation parameters related to analytical methods
	C606.5 Demonstrate the scope of quality certifications applicable to pharmaceutical industries
	C606.6 Plan the significance of qualification and calibration procedure for various analytical instruments

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BP607P Medicinal chemistry III – Practical	On completion of the course student will able to
	C607.1 Apply the quantitative analysis of various medicinal compounds.
	C607.2 Understand various reactions for the synthesis of Medicinal compounds.
	C607.3 Infer applications of microwave techniques in synthesizing medicinal compounds.
	C607.4 Examine the usage of chem draw soft ware to draw structures and reactions of medicinal compounds.
	C607.5 Analyse various physicochemical properties of Medicinal compounds application of drug designing software and lipinskies rule.
BP608P Pharmacology III – Practical	On completion of the course student will able to
	C608.1 Understand about dose calculation in pharmacology experiments.
	C608.2 Identify the methods of inducing different diseases to various types of animals.
	C608.3 Use simulated experiments.to understand isolation of different organs/tissues from the laboratory animals.
	C608.4 Describe about determination of acute skin and eye irritation/Corrosion of a test substances.
	C608.5 Apply simulated experiments to interpret the effect of drugs on animals.
	C608.6 Discuss the application of Biostatistics in various pharmacological experiments.
BP609P Herbal Drug Technology – Practical	On completion of the course student will able to
	C609.1 Examine crude drugs sample by preliminary phytochemical screening.
	C609.2 Calculate alcohol content of Asava and arista.
	C609.3 Produce herbal cosmetics and conventional herbal formulations by incorporating prepared and standardised extract.
	C609.4 Evaluate produced herbal cosmetics and formulations containing standardised extracts.
	C609.5 Evaluate excipients of natural origin and Analyse monograph of herbal drugs from recent pharmacopoeia
	C609.6 Calculate percentage of aldehyde, phenol and total alkaloid content in extract.

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B.PHARMACY VII SEMESTER CAY 2020-2021

COURSE OUTCOMES

Code/Sub	CO STATEMENTS
BP701T/Instrumental Method Analysis Theory	On completion of the course student will able to
	C701.1 Understand the basic principle, Theory, Instrumentation and Applications of Spectroscopic methods like UV Visible spectroscopy, IR spectroscopy, Flame Photometry, Fluorimetric, Atomic absorption spectroscopy & Nepheloturbidometry.
	C701.2 Understand the basic Spectroscopic concepts like Electronic transitions, solvent effect, fundamental modes of vibrations in poly atomic molecules and sample handling in Spectroscopic methods.
	C701.3 Understand the basic Principle, Methodology development techniques, advantages, disadvantages and applications of simple chromatographic techniques like Paper chromatography and Thin layer chromatography.
	C701.4 Understand the basic Principle, theory, instrumentation and Applications of High performance liquid chromatography (HPLC) and Gas chromatography.
	C701.5 Understand the basic Principle, theory, instrumentation and applications of Ion exchange chromatography, Gel chromatography and Affinity chromatography.
	C701.6 Understand the basic concept of derivatization and temperature programming in chromatographic methods.
BP702T/ Industrial Pharmacy-II Theory	On completion of the course student will able to
	C702.1 Know the importance of pilot plant scaleup techniques.
	C702.2 Able to learn about Technology development and transfer
	C702.3 Know the application of regulatory affairs.
	C702.4 Evaluate and learn the importance of Regulatory requirements for drug approval.
	C702.5 Understand the importance of quality management systems.
	C702.6 Able to evaluate the importance of Indian Regulatory Requirements.
BPH703 Pharmacy Practice Theory	On completion of the course student will able to
	C703.1 Know various drug distribution methods in a hospital
	C703.2 Appreciate the pharmacy stores management and inventory control
	C703.3 Monitor drug therapy of patient through medication chart review and clinical review and obtain medication history interview and counsel the patients
	C703.4 To identify and detect drug related problems and assess adverse drug reactions
	C703.5 Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states and know pharmaceutical care services
	C703.6 Describes patient counseling in community pharmacy, appreciate the concept of Rational drug therapy.

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BPH704 Nover Drug Delivery Systems Theory	On completion of the course student will able to
	C704.1 Understand the principles of Controlled drug delivery systems (CDDS) and polymers used in the formulation of CDDS.
	C704.2 Remember the concepts and types of microencapsulation and implant drug delivery system.
	C704.3 To apply the knowledge of targeted drug delivery system in the development of novel drug delivery system and monoclonal antibodies.
	C704.4 Analyzing the factors affecting the Gastro retentive drug delivery system and their different types.
	C704.5 Understand and define the nasal sprays, inhalers and nasopulmonary drug delivery system, ocular formulations ,intraocular barriers and significance of occuserts.
	C704.6 Explain the factors affecting permeation of drugs through transdermal drug delivery system and IUD's.
BPH705 Instrumental Method Analysis Practical	On completion of the course student will able to
	C705.1 Describes the assay of compounds by Spectroscopic methods.
	C705.2 Understand the assay of compounds by simultaneous methods.
	C705.3 Studies quenching of fluorescence.
	C705.4 Understand the Determination of alkaline earth metals by flame photometry.
	C705.5 Illustrates the Separation of compounds by chromatographic methods.
	C705.6 Explains the techniques like HPLC and Gas Chromatography.
BPH706/ PSPRACTICE SCHOOL	On completion of the course student will able to
	C706.1 To design and describe the experimental procedures and evaluations.
	C706.2 To Illustrate the principles involved in drug development.
	C706.3 To acquire the hands – on- training on the equipments used in the various drug development process and quality control.
	C706.4 To analyze the theoretical skills, compare and contrast with the practical technical skills.
	C706.5 To develop the practical skills so as to assess the problems encountered while working on the instruments.

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B.PHARMACY VIII SEMESTER CAY 2020-2021

COURSE OUTCOMES

Code/Sub	CO STATEMENTS
BP801T Biostatistics and research methodology Theory	On completion of the course student will able to
	C801.1 Describes basics of biostatistics, measures of central tendency, measures of dispersion and correlation
	C801.2 Illustrates the regression methods and concept of probability
	C801.3 Understands various techniques of analysis of variance(ANOVA) including parametric and non parametric methods
	C801.4 Introduce about research, types of graphics, design of research methodology
	C801.5 Infer the concept of hypothesis testing and statistical softwares
	C801.6 Explains about design and analysis of experiments
BP802T Social and Preventive Pharmacy Theory	On completion of the course student will able to
	C802.1 Understands fundamentals of health and disease, siciology and hygienity
	C802.2 Describes prevention and control of some infectious diseases
	C802.3 Create awareness on national health programs
	C802.4 Explains mother and child care, elderly health care and family welfare programs
	C802.5 Intervenes role of WHO in indian national programs
	C802.6 Illustrates community services in rural, urban and schools

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BP805ET Pharmaco vigilance Theory	On completion of the course student will able to
	C805.1 Understand history and development of Pharmacovigilances and understand drug safety monitoring scenario in India
	C805.2 Describe process of identification, reporting and assessment of new adverse drug reactions
	C805.3 Find about dictionaries, coding, terminologies and communications used in pharmacovigilance.
	C805.4 Examine the methods to generate safety data during pre-clinical, clinical and specific population like paediatric, geriatrics, pregnancy and lactation.
	C805.5 Identify the various guidelines like ICH and ICSR.
	C805.6Discuss about international guidelines like CIOMS.
BP809ET Cosmetic Science Theory	On completion of the course student will able to
	C809.1 Understand the basic principles of skin, hair and oral cavity and to describe the cosmetics and cosmeceutical products and their regulations.
	C809.2 Design the formulation of skin care and hair care products and their evaluations.
	C809.3 Compare and contrast the properties of antiperspants and deodorants.
	C809.4 Develop the formulations of oral care products and to illustrate the principles, analytical methods and to explain the role of herbals in cosmetics.
	C809.5 Apply the principles and concepts of cosmetics evaluations in designing the products.
	C809.6 Identify the cosmetic problems associated with hair and skin.

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PHARM. D I YEAR

Year	course name	urse C	CO No.	Course Outcome Statement
I	Human Anatomy and Physiology	1.1	CO 1	Describe the gross anatomy,morphology,structure and functions of various organs of human body at the cell and tissue level.
			CO 2	Categorize the various Haemopoitic mechanisms and their imbalance diseases.
			CO 3	Understand the gross morphology ,structure and functions of various systems in the human body.
			CO 4	Identify different types of family planning methods , devices and perform the pregnancy diagnosis test.
			CO 5	Analyse sense organ parameters by performing experiments and learn vital organs and gonads.
			CO6	Discuss about effect of athletic training on muscle and muscle performance.
	Pharmaceutics	1.2	CO1	Understand the basic concepts of different dosage forms for formulating and dispensing .
			CO2	Utilize the knowledge of pharmaceutical posology in dose solution of various dosage forms.
			CO3	Knowing the importance of pharmacy and different pharmacopoeias.
			CO4	Explain the role of additives involved in development of various dosage forms.
			CO5	Utilizing the applications of surgical instruments used in hospitals.
			CO6	Analyse the instabilities in formulations and suggest suitable measures to over come it.
	Medicinal Biochemistry	1.3	Co1	Describe cell and biochemical organization explain the role of enzymes involved in metabolic process of carbohydrates, protein. amino acids by animals' models
			Co2	Understand the metabolism and biological role of carbohydrates and lipids.
			Co3	Discuss the coenzyme system involved in biological oxidation and electron transport chain.
			Co4	Understand the metabolism and biological role of nucleic acid, proteins amino acid metabolism
			Co5	Analyze various organ functioning tests.
			Co6	Examine various electrolytes in the body fluids by conducting biochemical tests.
			Co7	Interpret different hormone. lipoproteins. and protein levels in serum for better understanding of endocrine and infectious diseases.
	Pharmaceutical Organic Chemistry	1.4	CO 1	Learn IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds
			CO 2	Explain the physical properties of organic compounds
			CO 3	Understand various nucleophilic and electrophilic substitution reactions and orientation order of reactivity of alkyl, acyl, aryl compounds
			CO 4	Learn free radical/ nucleophillic / electrophillic addition reactions and orientation, order of reactivity, stability of compounds
			CO 5	Describe oxidation and reduction reactions
			CO 6	Explain important named organic reactions with mechanisms
			CO 7	Discuss the methods of preparation test for purity. principle involved in the assay and important medicinal uses of some important organic compounds.
	Pharmaceutical Inorganic Chemistry	1.5	CO1	Understand errors, volumetric analysis, theory of indicators and various types of titrations under volumetric analysis.
			CO2	Analyse the various limit tests, medicinal gases, acidifiers, antacids and about cathartics.
			CO3	Learn the Gravimetry and examine about the electrolyte replenishers.
			CO4	Explain about the various essential trace elements and anti-microbials. Identify the various Pharmaceutical Aids.

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		CO5	Explain about the study of dental products and various miscellaneous pharmaceutical compounds.
		CO6	Know about various radio pharmaceuticals used in inorganic chemistry.
Remedial Mathematics/ Biology	1.6	CO1	Application of knowledge in pharmacy
		CO2	Apply computer applications
		CO3	mathematical method application in pharmacokinetics cramersmethod
		CO4	Analyse the calculus in pharmacy
		CO 5	improve the application knowledge
Pharmaceutics (Practical)	1.2	CO1	Review the basic requirements in compounding and dispensing of pharmaceutical products.
		CO2	Applying the knowledge of different techniques involved in preparation of drug products.
		CO3	Examine the incompatibilities observed in pharmaceutical dosage forms.
		CO4	Conducting the doasge calculations for different ages.
		CO5	Design of appropriate labels for dosage forms.
		CO6	Examine the formulas used in different pharmacopoeias in development of various pharmaceutical dosage forms.
Medicinal Biochemistry (Practical)	1.3	Co1	Analyze quantitative and qualitative analysis of normal constituents in urine.
		Co2	Analyze quantitative and qualitative tests to normal constituents in blood.
		Co3	Calculate the glucose levels in blood to identify diabetes mellitus
		Co4	Correlate the results obtained from quantitative experiments with that of normal biochemical values
		Co5	Examine lipids in blood.
		co6	Determine the electrolytes present in serum by using various diagnostic tests.

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PHARM. D II YEAR

Year	course name	Course Code	CO No.	Course Outcome Statement
II	Pathophysiology	2.1	CO1	Understand the basic principles of cell injury and process of inflammation
			CO2	Discuss about the concept of pathophysiology,clinical presentation of cardiovascular, respiratory and renal diseases
			CO3	Describe theclinical presentation of haemotological and endocrine disorders
			CO4	Describe about the pathophysiology and clinical presentation of the nervous and gastro intestinal diseases
			CO5	Discuss about the etiology, pathogenesis, clinical presentation and complication of cancer, hepatic and joint diseases
			CO6	Describe the etiology, pathogenesis, clinical presentation and complication of infectious diseases like meningitis,Tuberculosis,STDs etc.
	Pharmaceutical Microbiology	2.2	CO1	To acquire knowledge relevant to Microbiology
			CO2	Comare various microorganisms based on morphlogy,reproduction,growth,culture requirements and culture methods
			CO3	Demonstrate isolation and identification of microbes
			CO4	Know different methods of sterilization , equipment and sterilization of pharmaceutical products.
			CO5	Study of disinfectants, anti microbial agents and their methods of evaluation.
			CO6	Understand the concepts of immunology
			CO7	Study of infectious diseases and diagnostic methods
			CO8	Perform microbiological assays and standardization of biologicals
	Pharmacognosy & Phytopharmaceuticals	2.3	CO1	Understand the basics of Pharmacognosy and various aspects of the cultivation of Medicinal and Aromatic Plants.
			CO2	Aware of the various principles of Cytology like, cell wall, cell inclusions, primary and secondary metabolites of Pharmaceutical significance.
			CO3	Gain the knowledge of different microscopic and powder microscopic characters of analytical importance of Crude Drugs.
			CO4	Understand the principles of different natural pesticides.
			CO5	Know about the Carbohydrates and important Carbohydrate Drugs.
			CO6	Understand the Lipids and Lipid Drugs.
			CO7	Aware of the Proteins and Protein Drugs.
			CO8	Gain the knowledge of different methods of adulteration and substitution of the crude Drugs.
	Pharmacology-I	2.4	CO1	Understand the basic concepts in pharmacology, pharmacokinetics and pharmacodynamics to identify drug interactions and adverse drug reactions
			CO2	Apply the basics of pre-clinical and clinical evaluations in the development of new drugs
			CO3	Discuss the Pharmacology of drugs acting on ANS ,CNS and its related diseases.
			CO4	To study the Pharmacology of drugs acting on cardiovascular diseases.
			CO5	Describe the Pharmacological actions, uses, adverse effects, interactions and mechanism of action of drugs acting on respiratory system and related disease.
			CO6	Explain the Pharmacology of drugs acting on endocrine system and related diseases.
			CO7	Compare the Pharmacological actions, uses, adverse effects, interactions and mechanism of action of different autocoids and related drugs
	Community Pharmacy	2.5	CO1	Describe the business and professional practice management skills in community pharmacies
			CO2	Analyse and manage the prescriptions in the community pharmacy
			CO3	Management of various inventory control techniques in community pharmacy
			CO4	Explain the pharmaceutical care services
			CO5	Understand various methods of patient counselling.
			CO6	Describe the methods of health screening
			CO7	Recognize the minor ailments and develop the health promotions in the community
			CO8	Explain the rational drug therapy
			CO01	Examine therapeutic approach in the management of cardiovascular and respiratory system.
			CO02	Interpret etiopathogenesis and management of endocrine diseases.

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Pharmacotherapeutics-I	2.6	CO03	Organize individualised therapeutic plan for paediatric and geriatrics.
		CO04	Demonstrate the patient specific paramenters relevant in initiating and monitoring therapy during pregnancy and lactation.
		CO05	Execute clinical skills in therapeutic management of opthalmological conditions.
		CO06	Support the role of pharmacist in the rational usage of drug
Pharmacognosy & Phytopharmaceuticals(practicals)		CO1	Know the different materials, equipment, apparatus, experiments, methods in Pharmacognosy laboratory.
		CO2	Study the cell wall constituents and cell inclusions.
		CO3	Know the macro, micro and powder characters of different crude Drugs.
		CO4	Analyze the Lipid Drugs by various Lipid constants.
		CO5	Perform the identification/chemical tests for different crude Drugs.
Pharmaceutical Microbiology (Practical)		CO1	Know the principle, construction and working of various instruments used in microbiology
		CO2	Learn preparation and sterilization of media and glassware
		CO3	Perform isolation and identification tests for microorganims
		CO4	Enumerate microrganisms in a given sample
		CO5	Evaluate the test compound by using various evaluation tests
		CO6	Know the diagnosis of common diseases
		CO7	Learn sterility testing of various pharmaceuticals
		CO8	Determine antimicrobial activity of test compounds

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PHARM. D III YEAR

Year	course name	Course Cod	CO No.	Course Outcome Statement
III	Pharmacology-II	3.1	CO 1	Understand concept of coagulation and pharmacological actions, uses, adverse effects, interactions and mechanism of drugs acting on blood clot and on their related disease.
			CO 2	Classify diuretics and antidiuretics and describe their mechanism, pharmacological actions, adverse effects, clinical uses in various diseases
			CO 3	Apply the knowledge on basic principles of Chemotherapy including biochemical variations in various infectious microorganisms to use as a better target
			CO 4	Identify the basic principle, pharmacological action and mechanism of action, mechanism of resistance and spectrum of activity, Chemotherapy of various infection diseases
			CO 5	Discuss the concept of immunosuppression and different toxicity studies and describe the classification, mechanism, adverse effects and clinical uses of various immunosuppressants
			CO 6	Illustrate the chromosome structure and DNA replication
			CO 7	Differentiate various genetic processes and role of enzymes
	Pharmaceutical Analysis	3.2	CO 1	Know the Concepts of Quality Assurance, QC, GLP, ISO, Validation, TQM, ICH, Regulatory Control
			CO 2	Understand the different chromatographic techniques like paper, TLC, ion exchange, gas, HPLC, etc
			CO 3	Know the theoretical aspects, instrumentation, interpretation of electro chemical methods like Potentiometry, Conductometry, Polarography and Amperometry.
			CO 4	Understand and learn various spectroscopic methods, their instruments & applications of UV, IR, ESR and Fluorimetry.
			CO 5	Understand the theoretical aspects, instrumentation, elements of interpretation of spectra and application of Atomic, Flame & Polarimetry
			CO 6	Understand the principles and procedures of XRD and thermal analytical techniques like DSC and TGA.
	Pharmacotherapeutics-II	3.3	CO 1	Explain about the pathogenesis of Infectious diseases.
			CO 2	Provide effective treatment, and managing patients comfort in case of musculoskeletal disorders
			CO 3	Discuss the principles of cancer therapy and dermatological disorders
			CO 4	Tailor the effective treatment plan by prioritizing patient renal inefficiencies.
			CO 5	Discuss extensive knowledge regarding essential and rational drug use.
	Pharmaceutical Jurisprudence	3.4	CO1	Apply the basic knowledge to understand detailed study of import, manufacture, export of products in India
			CO2	Understand detailed study of various schedules of the D and C act,discuss rules and regulations of packing in India
			CO3	Infer the importance of application of pharmacy act 1948 in India
			CO4	Discuss the roles of medicinal and toilet preparations act 1955 and narcotic addiction.
			CO5	Discuss the prohibited advertisements as per drugs and magic remedies 1960
			CO6	Analyse the retail price and selling price of Products 2002
			CO7	Identify the evolution of drug legislation in India and Pharmacist Oath
	Medicinal Chemistry	3.5	CO1	Understand the different modern techniques of drug design
			CO2	Know the metabolism, therapeutic activity and adverse drug reactions of drugs.
			CO3	Understand the medicinal aspects, chemistry of drugs with respect to their biological activity.
			CO4	Acquire knowledge about chemotherapy of cancer and other microbial diseases.
			CO5	Interpret the SAR of various classes of medicinal compounds.
			CO6	Have been introduced to a variety of drug classes and their pharmacological properties.
			CO1	Understand the significance of formulation, and evaluation of pharmaceutical dosage forms.
			CO2	Knowing the use of additives in various dosage forms.
			CO3	Describe the importance of sterilization in preparationof parenterals.
			CO4	Idea on suitable packeging materials for dispensing of prepared formulations.
			CO5	Identification of various factors responsible for designing and development of different formulations.

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	Pharmaceutical Formulations	3.6	CO6	Understand the basic principles of opthalmic preparations.
			CO7	Describe the concept of controlled and novel drug delivery systems.
	Pharmaceutical Formulations (Practical)	3.6	CO1	Preparation of different formulations in development of various dosage forms.
			CO2	Conducting various evaluation tests for the prepared formulations.
			CO3	Preparation and evaluation of various cosmetic preparation
			CO4	Demonstration and operation of different instruments used in preparation of dosage forms.
			CO5	Demonstration of tablet counting equipment.
			CO6	Knowing about the containers/packaging materials for prepared formulations.
	Pharmacotherapeutics-II (Practical	3.3	CO 1	Identify drug interactions and rationalize the prescription
			CO 2	Discuss the therapeutic approach to management of selected diseases
			CO 3	Prepare individualized therapeutic plans based on diagnosis
			CO 4	Perform patient counselling

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PHARM. D IV YEAR

Year	course name	Course Code	CO No.	Course Outcome Statement
IV	Pharmacotherapeutics-III	4.1	CO1	Understand the pathophysiology of specific gastrointestinal disease states and illustrate the therapeutic approach to illness management
			CO2	Implement the recognition of patient-specific characteristics that are important for initiating and monitoring medication therapy.
			CO3	Design the treatment strategy for the care of certain neurological diseases , referencing the most recent evidence and address medication therapy's controversies
			CO4	Evaluate the development of individualized therapeutic strategies based on diagnosis, as well as to sketch out the pathophysiological alterations associated with each mental condition
			CO5	Examine the fundamentals of evidence-based therapy and pain management
			CO6	Investigate and analyze the various drug related problems to deliver better patient care
	Hospital Pharmacy	4.2	CO1	Develop the organizational structure of the hospital and hospital pharmacy
			CO2	Organising different drug policies and committees in the hospital.
			CO3	Operate various drug distribution methods in the hospital.
			CO4	Interpret the management of inventory control in the hospital pharmacy
			CO5	Identify the continuing professional development programs in the hospitals.
			CO6	Understand the manufacturing practices of various formulations in the hospitals.
			CO 7	Explain the professional relations and practices of hospital pharmacists.
			CO 8	Demonstrate the procedures for procuring and warehousing of the drug.
	Clinical Pharmacy	4.3	CO1	Collaborate with other organizations (e.g. governmental organizations, health organizations, business groups) to develop and promote public health policy
			CO2	Identify factors (e.g. low health literacy, cultural) that influence effective communication and modify communication strategies to optimize health care interactions
			CO3	Identify and collect information from health records that will influence optimal pharmacotherapy.
			CO4	Develop and maintain professional relationships with patients and health care Professionals.
			CO5	Participate in the process of conducting drug utilization evaluations and reviews
			CO6	Interpretation of laboratory investigations
			CO 7	Identify and select appropriate drug information resources.
			CO 8	Predict, identify, evaluate and report adverse drug reactions and medication errors and recommend actions to minimize drug errors.
			CO 9	Demonstrate expertise in informatics by acquiring, storing, analyzing, using, and disseminating medication-related data and knowledge in a manner that optimizes patient care and health outcomes
	Biostatistics & Research Methodology	4.4	CO1	Remebering the basic concepts about data and its distributions
			CO2	Understanding the types of data distributions
			CO3	Evaluating the measures of tendency dispersion
			CO4	Constructing the graphs & chats
			CO5	Identigying applying the parametric and Non-parametric tests.
			CO6	Evaluating and Analysing the ralation among the variables
			CO 7	Analysing the co-relation, Regression between the variables
	Biopharmaceutics & Pharmacokinetics	4.5	CO1	Discuss the concept of biopharmaceutics, pharmacokinetics and its applications.
			CO2	Understand the mechanism and factors affecting the ADME process.
			CO3	Selection of suitable drugs administered by different routes.
			CO4	Knowing the significance of pharmacokinetics in design and evaluation of dosage forms.
			CO5	Correlate between bioavailability with bioequivalence studies.
			CO6	Interpretation of various pharmacokinetic parameters by applying statistical models .

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Clinical Toxicology	4.6	CO1	Outline the assessment of circulation, airway and breathing and CNS depression evaluation decontamination and elimination.
		CO2	Summarise the various antidotes used in acute poisoning.
		CO3	Students will be able to articulate the factors affecting individual's response to a toxic chemical.
		CO4	Knowing the administration of activated charcoal, catharsis, gastric lavage, whole bowel irrigation and emesis.
		CO5	Distinguish the clinical symptoms of chronic poisoning by heavy metals.
		CO6	Early assessment of clinical manifestations and management of Snake, Arthropod bites and stings.
		CO 7	Devise public and health care professionals in the management of Mushroom, Mycotoxins and Food Poisoning.
		CO 8	Evaluate, minimize and prevent the substance abuse cases in local population.
Biopharmaceutics & Pharmacokinetics (Practical)	4.5	CO1	Execution of various techniques in improvement of dissolution characteristics of slightly soluble drugs.
		CO2	Comparision of in-vitro drug profiles of different marketed products.
		CO3	Evaluate pharmaceutic parameters from blood profile data.
		CO4	Interpret the bioavailability data with bioequivalence studies.
		CO5	Compare the clearance of drug with renal and non-renal routes of excretion.
		CO6	Infer the significance of protein drug binding.
Clinical Pharmacy (practical)	4.3	CO1	Provide accurate and succinct verbal or written drug information that is appropriate for the target audience (e.g. patient, caregiver or other health care professional).
		CO2	Identify factors (e.g. low health literacy, cultural) that influence effective communication and modify communication strategies to optimize health care interactions.
		CO3	Develop a monitoring plan and select appropriate drug therapy (e.g. drug, dose, route, frequency) and non-drug therapy.
		CO4	Conduct patient education including Assessment of patient for better understanding of treatment plan
		CO5	Respect and protect patient confidentiality.
		CO6	Implement interventions to improve adherence
		CO 7	Eradicate ward round participation and medication history interviews

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PHARM. D V YEAR

Year	course name	Course Code	CO No.	Course Outcome Statement
V	Clinical Research	5.1	CO 1	Knowledge about drug development process and various approaches to drug discovery.
			CO 2	Pharmacological, toxicological, IND application, drug characterization and dosage forms. Educate varous approches on drug discovery
			CO 3	Distinguish clinical trials, various phases, methods of post-marketing surveillance ANDA, ICH, GCP, CSCO.
			CO 4	Understand challenges, ethical guidelines in clinical research, IRB/IEC, the regulatory environment in the USA, Europe, India.
			CO 5	Summarize role & responsibility of personnel evolved, designing of clinical study documents CRF/ICF/DIC, SAFETY MONITORING IN CLINICAL TRIALS.
	Pharmacoepidemiology and Pharmacoeconomics	5.2	CO 1	To Evaluate the measurement of outcomes in Pharmacoepidemiology
			CO 2	To identigy various concepts of risk in pharmacoeidemiology
			CO 3	Understand various source of data for pharmacoepidemiological studies
			CO 4	Demonstrate selected speical applications of Pharmacoepidemiology
			CO 5	Implement various types of Pharmacoeconomic Evaluation
			CO 6	Introducing various application and softwares of pharmacoeconomics
	Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	5.3	CO 1	To study and learn the importance of clinical pharmacokinetics.
			CO 2	To evaluate the conversion from IV to Oral dosing and determine the dose and dosing Intervals.
			CO 3	Interpret and correlate the plasma drug concentration with the patient's therapeutic outcomes in different patients.
			CO 4	Analyze and resolve pharmacokinetic drug interactions, inhibition and induction mechanisms of drug metabolism.
			CO 5	Formulate and apply a design dosage regimen for individual patients based on different variabilities and interpret the pharmacokinetic and pharmacodynamic correlation in drug therapy
			CO 6	Recommend dosage adjustment for paediatrics, geriatrics and obese patients
			CO 7	To understand recommended dosage adjustment in renal and hepatic disease
			CO 8	Illustrate and apply pharmacokinetic parameters in clinical settings.
			CO 9	To learn what is population pharmacokinetics and the methods and analysis used to interpret the pharmacokinetic data.

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PHARMACEUTICAL ANALYSIS Ist SEMESTER			
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Modern Pharmaceutical Analytical Techniques (Theory)	MPA101T		**Upon completion of the course student will be able to**
		1	Understand the UV-Visible spectroscopy, IR, flame and atomic absorption spectroscopy.
		2	Know principles of NMR spectroscopy, instrumentation and applications.
		3	Understand the principles of mass spectroscopy, different ionization techniques and applications of mass spectroscopy.
		4	Understand the different chromatographic techniques like paper, ion exchange, gas, HPLC, etc
		5	Know the principles and procedures of paper and capillary electrophoresis; XRD and its applications.
		6	Understand the principles and procedures of potentiometry and thermal analytical techniques like DSC and TGA.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Advanced Pharmaceutical Analysis (Theory)	MPA102T		**Upon completion of the course student will be able to**
		1	Know about impurities classification, residual solvents classification and limits.
		2	Understand the classification of elemental impurities, factors affecting stability and stability commitment
		3	Understand accelerated stability studies, stability zones, photostability testing and stability of biological products.
		4	Understand the regulatory requirements and HPTLC fingerprinting.
		5	Know bioassays of vaccines and PCR instrumentation
		6	Understand the principles and procedures of different immunoassays.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Pharmaceutical Validation (Theory)	MPA103T		**Upon completion of the course student will be able to**
		1	Understand introduction of Qualification and Validation involving Validation Master Plan, DQ, IQ, OQ, PQ, RQ, FAT, SAT.
		2	Know qualification of analytical instruments and glassware
		3	Know Advanced Validation of Utility Systems (Water, HVAC, Compressed air and Nitrogen) and Cleaning Validation.
		4	Know Analytical Method Validation according to USP and ICH guidelines.
		5	Understand Rigorous detailing of General principles of Intellectual Property.

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Course	CourseCode	Course Outcome Number	Course Outcome
ood Analysis (Theory)	MPA104T		**Upon completion of the course student will be able to**
		1	Learn about the flavor studies and to detect spoilage of food.
		2	Understand the advanced analytical methods for estimation of concentration of carbohydrates, vitamins, fats, amino acids, proteins in food.
		3	Understand the process of determining nutritional quality
		4	Know very well about Chromatography techniques like GC-MS,LC-MS,Electrophoresis,HPLC,HPTLC,SFC, HPCPC, RIA,ELISA in analysis of food adulterants.
		5	Understand how to select a suitable analytical method for qualitative and quantitative analysis of a pesticide residues in food substance.
		6	Know about the use of BIS MARK, AGMARK on food substances.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
harmaceutical Analysis Practical I (Practical)	MPA105PA		**Upon the completion of the course student will be able to perform**
		1	Calibration of glasswares and pH meter
		2	Calibration of UV-Visible spectrophotometer and FTIR spectrophotometer
		3	Calibration of GC and HPLC
		4	Cleaning validation of any one equipment and Imupurity profiling of drugs
		5	Assay of official compounds by different titrations and instrumental techniques
		6	Estimation of riboflavin/quinine sulphate by fluorimetry; Estimation of sodium/potassium by flame photometry
		7	Quantitative determination of hydroxyl group and amino group, and Colorimetric determination of drugs by using different reagents
harmaceutical Analysis Practical I (Practical)	MPA105PB		**Upon completion of the course student will be able to**
		1	Learn about the determination of total reducing sugar, proteins, vitamins content in foods
		2	Determine the saponification value, Iodine value, Peroxide value, Acid value of food products.
		3	Understand the selection of analytical methods for analysis of synthetic colors in food products
		4	Know very well about determination of concentration of preservatives and pesticides residue in food products
		5	Understand the selection of various analytical methods for determining food additives
		6	Determine density and specific gravity of food substances.

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Course	CourseCode	Course Outcome Number	Course Outcome
minar/Assign ment			**Upon completion of the course student will be able to**
		1	Improve Oral and written communication skills.
		2	Explore an appreciation of theself in relation to its larger diverse social and academic contexts.
		3	Understand and discuss current, real-world issues
		4	Introduce to different types of scholarly sources and how to access them
		5	Provide with preliminary skills to do further research in the field of international relations
		6	Know how to break down a piece of writing into its component parts and analyze the arguments
		7	Give the opportunity to read in depth on a topic and understand how different pieces of scholarship are engaged in conversation with one another.
PHARMACEUTICAL ANALYSIS IInd SEMESTER			
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Advanced nstrumental Analysis (Theory)	MPA201T		**Upon completion of the course student will be able to**
		1	Understand the basic principles of HPLC and applications of HPLC.
		2	Understand the chromatographic techniques like size exclusion, ion exchange, ion pair, affinity, gas and HPTLC.
		3	Know basic concepts about SFC, CE and CE-MS hyphenation.
		4	Understand the principles of mass spectroscopy, different ionization techniques, mass analysers and MS/MS systems.
		5	Understand the NMR spectroscopy, 2D NMR techniques and LC-NMR hyphenation
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Modern Bio-Analytical Techniques (Theory)	MPA202T		**Upon completion of the course student will be able to**
		1	Perform extraction of drugs and metabolites from biological samples and validation of bio-analytical methods
		2	Know factors affecting bioavailability, transport models and permeability methods.
		3	Understand drug interactions, microsomal assays and toxicokinetics; and applications of LC-MS in bioactivity screening and proteomics.
		4	Know cell culture techniques, cell viability assays and flow cytometry.
		5	Expalin Metabolite identification by microsomal approaches and drug product performance

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Course	CourseCode	Course Outcome Number	Course Outcome
uality Control and Quality Assurance (Theory)	MPA203T		**Upon completion of the course student will be able to**
		1	Understand concepts of QC/QA, GLP, ICH Guidelines Q-Series. Purchase specifications, selection of vendors and maintenance of stores
		2	Know cGMP guidelines in accordance to USFDA including CDER, CBER, PIC, WHO, EMEA for industrial management and CPCSEA guidelines.
		3	Understand detailed analysis of raw materials, IPQC, finished products and developing specifications according to ICH Q6 and Q3.
		4	Know characteristic documentation in pharmaceutical industry
		5	Understand clear perspective of manufacturing operations and controls.
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
Herbal and Cosmetic Analysis (Theory)	MPA204T		**Upon completion of the course student will be able to**
		1	Learn about the Quality control of crude drugs
		2	Understand the advanced analytical methods for estimation of adulterants and deterioration of herbal drugs
		3	Understand the process of detection of herbal drugs and monographs of herbal dugs
		4	Know very well about herbal drug- drug interactions
		5	Know about the evaluation of cosmetic products
Course	**CourseCode**	**Course Outcome Number**	**Course Outcome**
harmaceutical Analysis Practical II (Practical)	MPA205PA		**Upon completion of the course student will be able to**
		1	Know comparison of absorption spectra by UV and Wood ward – Fiesure rule and Interpretation of organic compounds by FT-IR
		2	Know Interpretation of organic compounds by NMR and MS
		3	Understand determination of purity by DSC in pharmaceuticals and Identification of organic compounds using FT-IR, NMR, CNMR and Mass spectra
		4	Perform bio molecules separation utilizing various sample preparation techniques and quantitative analysis of components by gel electrophoresis and HPLC techniques
		5	Perform Isolation of analgesics from biological fluids (Blood serum and urine).

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		6	Know protocol preparation and performance of analytical / bioanalytical method validation, and protocol preparation for the conduct of BA/BE studies according to guidelines
harmaceutical Analysis Practical II (Practical)	MPA205PB		**Upon completion of the course student will be able to**
		1	Perform in process and finished product quality control tests for tablets, capsules, parenterals and creams
		2	Perform quality control tests for primary and secondary packing materials, and assay of raw materials
		3	Know testing of related and foreign substances in drugs and raw materials, and preparation of Master Formula Record and Batch Manufacturing Record
		4	Perform quantitative analysis of rancidity in lipsticks and hair oil, and determination of aryl amine content and Developer in hair dye
		5	Know determination of foam height and SLS content of Shampoo, and determination of total fatty matter in creams
		6	Know determination of acid value and saponification value, and determination of calcium thioglycolate in depilatories

Course	CourseCode	Course Outcome Number	Course Outcome
minar/Assign ment			**Upon completion of the course student will be able to**
		1	Improve Oral and written communication skills.
		2	Explore an appreciation of theself in relation to its larger diverse social and academic contexts.
		3	Understand and discuss current, real-world issues
		4	Introduce to different types of scholarly sources and how to access them
		5	Provide with preliminary skills to do further research in the field of international relations
		6	Know how to break down a piece of writing into its component parts and analyze the arguments
		7	Give the opportunity to read in depth on a topic and understand how different pieces of scholarship are engaged in conversation with one another.

M. Pharmacy IIIrd Semester (Common for all Speciallizations) (PCI Regulation)

Course	Course Code	Course Outcome Number	Course Outcome
Research			**Upon completion of the course student will be able to**
		1	Identify the concepts of medical research and values in medical ethics.
		2	Define the CPCSEA guidelines for laboratory animal facility.
		3	Describe the declaration of Helsinki and basic principles for medical research.
		4	Understand Basic statistical methods which are used in collecting data study and analyze. Observe Errors relating experimentation

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Methodology d Biostatistics	MRM301T	5	Percieve relation between components also measure and study linearly. We can observe one component influence with multiple factors.
		6	Know testing of the hypothesis and understand how far population parameter significant based on estimator with the help of parametric tests. Non parametric tests can also observed
		7	Define analysis of variance helps in study total variation
		8	Know application of Analysis in field or lab experimental to design and factorial experiments.
		9	Apply the knowledge in research objects about reliability and validity experimental study
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Journal club			**Upon completion of the course student will be able to**
		1	Critically appraise the research article of their specialization published in reputed journals. Students are trained for inquiry based learning and critical thinking skills.
		2	Access journals by adopting search engines and made to collect relevant data, analyze and comment on the findings with the submission of the document evidence and present on the same for assessment
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
Discussion / Presentation			**Upon completion of the course student will be able to**
		1	Select the topic for carryingout the research work and collection of literature on the selected topic.
		2	Plan the work to be performed systamatically and present it in a neat way.
Course	**Course Code**	**Course Outcome Number**	**Course Outcome**
esearch Work			**Upon completion of the course student will be able to**
		1	Generate the topic for the project and Collect the information from the relevant sources
		2	Assemble the information into a more realistic draft ethically and conclude the contents.
		3	Prepare the presentation and explain outcome of their project along with further scope for research. This develops their oratory and leadership skills
M. Pharmacy IV th Semester (Common for all Speciallizations) (PCI Regulation)			
Journal club			**Upon completion of the course student will be able to**
		1	Critically appraise the research article of their specialization published in reputed journals. Students are trained for inquiry based learning and critical thinking skills.
		2	Access journals by adopting search engines and made to collect relevant data, analyze and comment on the findings with the submission of the document evidence and present on the same for assessment

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Course	Course Code	Course Outcome Number	Course Outcome
			Upon completion of the course student will be able to
		1	Perform the work in the innovative and systematic way
esearch Work		2	Assemble the information into a more realistic draft ethically and conclude the contents.
		3	Prepare the thesis by arranging the contents in a orderly manner and preparation of the research manuscript.

Course	Course Code	Course Outcome Number	Course Outcome
			Upon completion of the course student will be able to
scussion/Final		1	Prepare the presentation based on the results obtained in the research work
Presentation		2	Explain outcome of their project along with further scope for research. This develops their oratory and leadership skills

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M.PHARMACY I SEMESTER

CO

Year/Sem	Code/Sub	
M. Pharmacy VII Sem	MPH101T Modern Pharmaceutical Analytical Techniques–Theory	Apply and evaluate importance of different Spectroscopic techniques
		Learn about the theory and practice of Spectroflorimetry
		Identifying the role of NMR in drug evaluation
		Application of Mass spectroscopy in determination of components
		Understanding importance of various chromatographic techniques
		Differentiating and understanding the concepts of electrophoresis and crystallography
M. Pharmacy VII Sem	MPH102T Drug Delivery System – Theory	Understanding about various drug release aspects
		Analyzing the role of controlled delivery of drugs
		Evaluating the efficacy of drug in form of GRDDS
		Development and evaluation of Ocular delivery systems
		Distingwish importance of permeation enhances in transdermal delivery
		Know the importance of vaccines
cy VII Sem	MPH103T Modern	Application of preformulation concepts in development of vatious dosage forms
		Application and understanding of validation process
		Understading the importance of Industrial management system
		Evaluating the role of compression and compaction

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M. Pharma	Pharmaceutics – Theory	Designing and application of statistical methods
M. Pharmacy VII Sem	MPH104T Regulatory Affair – Theory	Knowing the importance of documentation
		Understanding the role of regulatory department in drug approval
		Evaluating the role of regulatory affairs in various countries
		Knowing and understading about IND and NDA
		Designing and evaluation of clinical trials
		Understanding the concept of non clinical drug development process
M. Pharmacy VII Sem	MPH105P Pharmaceutics Practical I	Analysis and evaluation of drug and drug products
		Formulation and evaluation of sustained formulations
		Understading the importance of preformulation studies
		Studying and evaluating various micromreritic properties
		Design and evaluation of transdermal patches
		Application of kinetic models in drug release from different dosage forms

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M.PHARMACY II SEMESTER

CO

Year/Sem	Code/Sub	
M. Pharmacy VII Sem	MPH201T Molecular Pharmaceutics (Nano Tech and Targeted DDS) – Theory	Understanding the role and importance of drug targetting
		Differentiating of various novel drug delivery systems
		Design and evaluation of pulmonary drug delivery systems
		Understanding application of micro and nano based systems
		Application of gene therapy and knowing its importance
		Knowledge of therapeutic antisense molecules and aptamers as drugs
M. Pharmacy VII Sem	Advanced Biopharmaceutics & Pharmacokinetics – Theory	Basic concepts in biopharmaceutics and pharmacokinetics
		Evaluation of biopharmaceutic studies involving drug product equivalency
		Design and evaluation of dosage regimens of the drugs using pharmacokinetics
		Knowing about factors affecting drug absorption
		Application and importance of In vitro–in vivo correlation
		Differentiating of Pharmacokinetics and pharmacodynamic, drug interactions
M. Pharmacy VII Sem	MPH203T Computer Aided Drug Delivery System – Theory	Knowing history of Computers in Pharmaceutical Research and development
		Application of Computational Modeling of Drug Disposition
		Utilizing of Computers in Preclinical Development
		Understading the role of Optimization Techniques in pharmaceutical formulation
		Evaluation of Computer-aided biopharmaceutical characterization and its application
		Application and importance of Artificial Intelligence
cy VII Sem	MPH204T Cosmetic and	Knowing about Key ingredients used in cosmetics and cosmeceuticals
		Importance of Formulation Building blocks
		Understading the Biological aspects of cosmetics
		Design and evaluation of various cosmeceutical products

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M. Pharma	Cosmeceuticals – Theory	Application and importance of Herbal Cosmetics
M. Pharmacy VII Sem	MPH205P Pharmaceutics Practical II	Formulation and evaluation of various encapsulated dosage forms
		Studying on improvement of dissolution characteristics of slightly soluble drugs
		Evaluating Protein binding studies of a highly protein bound drug & poorly protein bound drugs
		Using of Design Expert Software in formulation optimization
		Formulation and evaluation of various cosmetics
		Evaluating of herbal formulations

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M.PHARMACY III SEMESTER

CO

Year/Sem	Code/Sub	
M. Pharmacy VII Sem	MRM 301T Research Methodology and Biostatistics–Theory	Understanding various strategies to eliminate errors/bias in research
		Application of Biostatistics in preparation of robust formulation
		Knowing History, basic principles for all medical medical
		Differentiating of various statistical designs
		Application of CPCSEA guidelines for laboratory animal facility
		Preparation and evaluation of SOPs, personnel in research methodology

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