

Program Outcomes (POs)

The Program Outcomes of Bachelor in Pharmacy course are:

1. **Pharmacy Knowledge:** An ability to acquire , demonstrate, core and basic knowledge of Pharmaceutical and Life Sciences
2. **Planning Abilities:** An ability to develop, implement, effectively plan and organize work using time management, resource management, delegation skills and organizational skills to achieve goals in specified timeline.
3. **Problem Analysis:** An ability to identify, analyze, interpret data and take appropriate decision to solve problems related to routine Pharmacy Practices by applying acquired knowledge.
4. **Modern Tool Usage:** An ability to understand, choose and utilize Modern techniques and computing tools for Pharmacy practices by considering constraints.
5. **Leadership Skills:** An understanding of pharmaceutical management principles and apply these to one's own work, as a member and leader in a team, to manage projects to facilitate improvement in social health and well being.
6. **Professional Identity:** An ability to recognize, analyze and communicate Pharmacy professional values as a healthcare promoter.
7. **Pharmaceutical Ethics:** ability to understand and use professional, ethical, legal, social issues and responsibilities for well being of the society.
8. **Communication:** An ability to comprehend, write reports, present and document to communicate effectively for exchange of professional information to Pharmacy community and society.
9. **The Pharmacist and Society:** An ability to overcome the societal, health and legal problems by providing better pharmaceutical care relevant to the Pharmacy profession.
10. **Environment and Sustainability:** An ability to recognize the impact of the professional Pharmaceutical solutions in social and environmental circumstances for sustainable development.
11. **Life-Long Learning:** An ability to recognize the need to engage in continuous Professional development by taking in consideration timely feedback and technological changes for life long learning process.



Program Specific Outcomes (PSO)

Pharmacy Students are able to:

PSO 1: To build graduate to excel in technical or professional careers in various pharmaceutical industry and/ or institute and /or Health care system through rigorous education. Also analyze and communicate the skills, values of their professional roles in society.

PSO 2: To learn, select, apply appropriate methods, procedures, resources and modern pharmacy-related computing tools with an understanding of the limitations.

PSO 3: To operate, control, analyze and evaluate chemical substances and finished products also processes within permissible limits.

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





Principal

Course Outcomes Semester I

Course Code	Course Name	CO	Course Outcome Statement
(BP101T)	Human Anatomy and Physiology I– Theory	1	Define various terminologies, organ system and homeostasis mechanism of human body
		2	Explain anatomical organization, morphology & physiological functions of the skeletal system, cardiovascular system, lymphatic system & nervous system
		3	Discuss the role of body fluids & blood in homeostasis and body fluid regulation
		4	Illustrate cellular and tissue level organization with respect to morphological structure and their functions
		5	Summarize structure, functions and disorders of special sense organs
(BP107P)	Human Anatomy and Physiology Practical	1	Manipulate compound microscope for histopathological studies of cells, tissues and organ sections
		2	Perform hematological test like blood cell count, hemoglobin estimation, bleeding/clotting time, ESR and blood group
		3	Measure pulse rate, heart rate, blood pressure using various methods & instruments
		4	Identify axial and appendicular bones of human skeleton
(BP102T)	Pharmaceutical Analysis I – Theory	1	Explain volumetric analysis method for estimation of selected compound officially pharmacopeia.
		2	Explain electrochemical analysis method for estimation of selected compound officially pharmacopeia.
		3	Explain gravimetric analysis method for estimation of selected compound officially pharmacopeia.
		4	Explain various method of expressing conc. & uses of primary and secondary std.





Course Code	Course Name	CO	Course Outcome Statement
			for chemical analysis.
		5	Explain error in measurement.
(BP108P)	Pharmaceutical Analysis I – Practical	1	Prepare & standardization different chemical reagent as per pharmacopoeia.
		2	Measure percentage purity of given pharmaceutical drugs by titrimetric analysis
		3	Measure / calculate Determine normality of a solution by electro-analytical methods
		4	Measure refract index as selected sample by using refract meter.
(BP103T)	Pharmaceutics I – Theory	1	Explain history of pharmacy profession and Pharmacopoeias.
		2	Explain various dosage form solid(powder),liquid, semisolid dosage form with respect to nature,classification,preparation,advantage and disadvantage.
		3	Explain parts of prescription and errors of prescription including calculation of dose.
		4	Describe different pharmaceutical incompatibilities in pharmaceutical preparation.
		5	Use imperial and metric system to prepare percentage solution, 2llegation, proof spirit, isotonic solution based on freezing point and molecular weight.
(BP109P)	Pharmaceutics I – Practical	1	Use procedure and material to prepare solid, liquid and semi-solid dosage forms.
		2	Identify an appropriate container for storing the the prepared dosage form
		3	Prepare label of pharmaceutical products.
(BP104T)	Pharmaceutical Inorganic Chemistry – Theory	1	Explain various of type, sources & significance of impurities & procedure involved in their identification with their official limit in pharmaceutical substances.
		2	Describe theory, principle, and monograph of Acid, Base, Buffers and Electrolyte's compounds.
		3	Discuss medicinal importance of Dental product, Gastrointestinal compounds.



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Course Code	Course Name	CO	Course Outcome Statement
		4	Explain concept and monograph of compounds used as Expectorant, Emetics, Haematinics, Poison, Antidotes, Astringents.
		5	Describe storage condition, application of Radioactive substances.
(BP110P)	Pharmaceutical Inorganic Chemistry – Practical	1	Identify impurities present in inorganic compounds by performing limit test.
		2	Identify inorganic compounds.
		3	Analyze inorganic compounds.
BP105T	Communication Skill – Theory	1	To illustrate the communication process and importance of communication.
		2	To communicate effectively (Verbal and Non Verbal).
		3	Acquire the knowledge of listening skill and application.
		4	To develop interview skills.
		5	To develop leadership qualities and essentials
BP111 P	Communication Skills	1	Explain basic Communication Skills
		2	To Illustrate Various Pronunciation Skills.
		3	To Access Direct / Indirect & Effective CommunicationsSkills
		.4	To Describe Effective Writing Skills & Presentation
	Remedial Biology - Theory	1	To understand Basic Nature of Plant cell and Animalcell)
		2	To illustrate Classification System of both Plants & Animals
		3	To learn Various tissue system and organ system in plantand animals
		4	To understand Theory of evolution
		5	To illustrate Anatomy and Physiology of plants andanimals
	Remedial Mathematics-Theory	1	To apply mathematical concepts and principles toperform computations for Pharmaceutical Sciences.
		2	To illustrate mathematical representations andmathematical relationships



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Course Code	Course Name	CO	Course Outcome Statement
		3	To communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy
		4	To learn Perform abstract mathematical reasoning
BP112RBP	Remedial Biology Remedial Biology	1	To understand Microscopic study and identification of tissues.
		2	To learn Microscopic study and identification of tissues
		3	To examine bone parts and blood components in body
		1	To understand Microscopic study and identification of tissues.
S.Y.B.Pharm (SEM-III)			
(BP301T)	Pharmaceutical Organic Chemistry II – Theory	1	Discuss the reactions & orientation of reaction of benzene & its derivatives towards electrophilic substitution reactions
		2	Explain general methods of preparation and reactions of phenols and aromatic amines
		3	Discuss stereoisomerism of organic compounds with respective types, structure, nomenclature, assigning the configuration & their significance on biological activity.
		4	Differentiate the polynuclear medicinal organic compounds with respect to their chemistry.
		5	Summarize different theories related to stability of cycloalkane & reactivity of cyclopropane & cyclobutane.
		6	Describe the chemistry of fats and oils.
(BP305P)	Pharmaceutical Organic Chemistry II – Practical	1	Apply recrystallization and steam distillation methods for purification of synthesized organic compounds
		2	Categorize the binary mixture of organic compounds by using procedure.
		3	Demonstrate saponification value of fats and oils using giving procedure





Course Code	Course Name	CO	Course Outcome Statement
		4	prepared purified specified organic compounds using a given synthetic procedure.
	Pharmaceutical Microbiology – Theory	1	Describe the classification, explain methods of identification, discuss on microbial growth/reproduction, cultivation, quantification and preservation of microorganisms.
		2	Explain the microbial control techniques such as sterilization, sterility tests, disinfection and preservation of pharmaceutical products.
		3	Recognize appropriate methods for microbiological standardization and cell culture technology.
		4	Discuss on types, factors affecting, sources and assessment of microbial contamination and spoilage along with to examine stability of microbial cultures and its applications in pharmaceutical industry and research.
	Pharmaceutical Microbiology – Practical	1	Explain various equipments used in microbiology
		2	Differentiate methods of sterilization and sterility testing of pharmaceuticals.
		3	Construct and choose culture media for the growth of microorganisms.
		4	Assume the type of isolated bacteria.
		5	Attempt aseptic procedures for inoculation.
(BP304T)	Pharmaceutical Engineering – Theory-	1	Explain significance of Renolds number, Bernoulli's theory, working of various manometer and flow meters with respect to flow of fluids.
		2	Explain objective, principle, applications and working of various unit operations like size reduction, size separation, heat transfer, evaporation, distillation, drying, mixing, and filtration in pharmaceutical industry.
		3	Categorize various equipment's used in pharmaceutical industry during unit operations.
		4	Outline various factors affecting material selection for pharmaceutical plant construction.
		5	Describe theories of corrosion, types of corrosion and their prevention.



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Course Code	Course Name	CO	Course Outcome Statement
BP308P	Pharmaceutical Engineering – Practical	1	Perform experiments related to unit operations.
		2	Operate equipment's used in the manufacturing of pharmaceutical products.
		3	Interpret results of the experiments conducted.
		4	Illustrate the material and energy requirements for optimizing the pharmaceutical unit process.
BP302T	Physical Pharmaceutics	1	Explain solubility of various states of matter with respect to principles, expressions, laws governing the solubility and their applications in drug solubilization.
		2	Discuss various states and properties of matter.
		3	Discuss surface and interfacial phenomenon, methods for its instrumentation, surface active agents and HLB Scale.
		4	Classify the complexation, applications, stability of drug complexes and biological actions.
		5	Apply pH and buffer concepts in pharmaceutical and biological systems
BP306P	Physical Pharmaceutics	1	Measure the pKa value, partition coefficient and solubility of drugs.
		2	Measure HLB Number ,CMC of surfactant , Freundlich and Langmuir Constant.
		3	Demonstrate solubility and pH titration method for stability constant and donor acceptor ratio
		4	Measure surface tension of the given liquids by drop count and drop weight method.
		5	Calculate percentage composition of NaCl in a solution using phenol -water system by CST Method
T.Y.B.Pharm (SEM-V)			
	Medicinal Chemistry II	1	Classify antihistaminics, antianginals, antihypertensives, antiarrhythmics, antihyperlipidemics, and drugs acting on endocrinal system based on their chemical structure
		2	Explain relationship between chemical structure and biological activity of



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Course Code	Course Name	CO	Course Outcome Statement
			antihistaminics, antianginals, antihypertensives, antiarrhythmics, antihyperlipidemics, and drugs acting on endocrinal system
		3	Illustrate chemical synthesis pathway of specified drug molecules
BP502T	Industrial Pharmacy–	1	Describe, preformulation, formulation, manufacturing, packaging, and evaluation of tablets, capsule, pellets, liquidorals, aerosols, parenterals and ophthalmic dosage form
		2	Explain formulation and preparation of lipsticks, shampoo, cold cream, vanishing cream, tooth paste, hair dyes and sun screen
		3	Choose appropriate packaging material for various pharmaceutical products as per legal and official requirement
	Industrial Pharmacy I – Practical BP506P	1	Analyze preformulation studies on various drugs
		2	prepared various dosage forms including various dosage form including tablet, capsule, injection eye drop, eye ointment and creams.
		3	Evaluate various dosage form like tablet, capsule, and glass containers
		4	Assess marketed tablet and capsule formulation as per pharmacopial standard.
	Pharmacology II – Theory	1	Discuss the pharmacology of drugs acting on cardiovascular, endocrine and urinary systems
		2	Explain pathophysiological role of autocooids and pharmacology of drugs related to autocooids
		3	Describe pharmacology of NSAID's, antigoute and antirheumatic drugs
		4	Illustrate bioassay of insulin, oxytocin, vasopressin, ACTH, d-tubocurarine, digitalis, histamine and 5-HT
	Pharmacology II – Practical	1	Understand in-vitro pharmacology and physiological salt solutions.
		2	analyse effect of drugs on blood pressure and heart rate of dog/ Frog



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Course Code	Course Name	CO	Course Outcome Statement
		3	Perform bioassay of various drugs on isolated ileum preparation
		4	Demonstrate analgesic, anti-inflammatory and diuretic activity by using software
BP504T	Pharmacognosy and Phytochemistry II	1	Discuss the various metabolite pathway for formation of different metabolites.
		2	Discuss general introduction, systematic pharmacognostic study and applications of secondary metabolites
		3	Explain isolation, identification and analysis of various Phytoconstituents
		4	assess the industrial production, estimation and utilization of the phytoconstituents
		5	Discuss the basics of phytochemistry and modern extraction techniques, characterization, identification and applications of the herbal drugs and phyto-constituents.
BP504P	Pharmacognosy and Phytochemistry II	1	evaluate morphology, histology and powder characteristics, extraction & detection of crude drugs
		2	assess extraction and isolation and detection of active principles crude drug
		3	apply and identify the extracts by using various chromatographic techniques like paper, TLC
		4	Assess and identify the extracts by distillation method and TLC
	Pharmaceutical Jurisprudence – Theory	1	To know the business and professional practices management skills in community pharmacy.
		2	To conduct medication history interview and provide patient counseling.
		3	To investigate and appreciate the pharmacy stores management and inventory control
		4	To identify and resolve various prescription related problems .
Final B.Pharm (SEM-VII)			
BP701T	Instrumental Methods	1	Explain principle of spectroscopic techniques includes UV –Visible spectroscopy,



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Course Code	Course Name	CO	Course Outcome Statement
	of Analysis –		fluorimetry , IR spectroscopy, Flame photometry, atomic absorption spectroscopy and nepheloturbidometry
		2	Illustrate instrumentation of UV –Visible spectroscopy, fluorimetry , IR spectroscopy, Flame photometry, atomic absorption spectroscopy and nepheloturbidometry
		3	Apply spectroscopic methods for quantitative & qualitative analysis of drugs using UV –Visible spectroscopy, fluorimetry , IR spectroscopy, Flame photometry, atomic absorption spectroscopy and nepheloturbidometry methods.
		4	Explain principle of chromatographic techniques including paper chromatography , thin layer chromatography ,column chromatography , HPLC, HPTLC , Ion exchange chromatography , gel chromatography
		5	Illustrate instrumentation of chromatographic techniques including paper chromatography , thin layer chromatography ,column chromatography , HPLC, HPTLC , Ion exchange chromatography , gel chromatography
	Instrumental Methods of Analysis – Practical	1	Show UV absorption maxima and effect of solvent on absorption maxima of organic compounds
		2	Demonstrate protocol techniques for separation and isolation of compounds
		3	Measure % purity of Compounds by using Fluorimetric methods
		4	Measure Alkali metals by using Flame Photometer
	Industrial Pharmacy II – Theory	1	Discuss the process of pilot plant scale up, relevant documentation, and SUPAC guidelines for manufacturing of solids, Liquid orals, and semisolid dosage form.
		2	Outline WHO guidelines for technology transfer with respect to production, documentation, quality management of pharmaceuticals, and regulatory bodies for approval and commercialization.
		3	Explain role and requirement of regulatory affairs & authorities involved in various



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Course Code	Course Name	CO	Course Outcome Statement
			stages of drug development including from non-clinical stages to clinical studies.
		4	Explain quality management system of pharmaceuticals and various certification agencies defining the quality standards.
		5	Summarize the approval process and regulatory requirements for new drug products.
	Novel Drug Delivery System – Theory	1	Summarize the concept and applications of Novel Drug Delivery system
		2	Apply various principals of drug release in designing of controlled release formulations by using different classes of polymers
		3	Explain applications of liposomes ,nanosomes ,nanoparticals and monoclonal antibodies in develoment of targeted drug delivery dosage forms
		4	Discuss formulation ,evaluation and applications of Drug Delivery systems like Microencapsulations, Mucoadhesive,Implants,Transdermal,Gastroretentive,Nasopulmonary,Ocular and Intrauterine
BP703T	Pharmacy Practice	1	Know the business and professional practices management skills in community pharmacy
		2	Conduct medication history interview and provide patient counseling
		3	Investigate and appreciate the pharmacy stores management and inventory control
		4	Identify and resolve various prescription related problems
		5	Identify, categorize, assess and report Adverse Drug Reaction.
F.Y.M.Pharm (SEM-I) Pharmaceutical Quality Assurance			
	MODERN	1	To describe and understand identification characterization and quantification of drugs using instrumental techniques.
		2	To learn and understand principle and instrumentation of different spectroscopic techniques.





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MPC 101T	PHARMACEUTICAL ANALYTICAL TECHNIQUES	3	To learn and understand principle and instrumentation of different chromatographic techniques
		4	To learn and understand principle and instrumentation of electrophoresis and X-ray techniques
		5	To understand application of different instrumental techniques.
MQA102T	Quality Management System	1	To explain the importance of quality, justify the parameters that affect the quality.
		2	To understand the six sigma inspection model.
		3	To explain drug stability and justify design & process development.
		4	To examine the statistical process control for quality & to plan for statistical process control.
MQA103T	Quality Control and Quality Assurance	1	CO1: To explain concept of Quality Control, Quality Assurance and Documentation in pharmaceutical industry.
		2	To discuss cGMP guidelines and use of it in pharmaceutical industry. To investigate raw material and finished product.
		4	To illustrate Manufacturing operations and controls: Sanitation of manufacturing premises.
		1	To describe and understand the principles of new drug discovery and development
MQA104T	Product Development and Technology transfer	2	To explain role of preformulation, stability study and pilot plant scale up in drug product development
		3	To explain role of packaging material in pharmaceutical dosage form and their quality control test
		4	To discuss and apply various aspects of technology transfer from R&D to actual manufacturing
		1	To Analyse quantitatively organic and inorganic constituents by using Instrumental Methods of Analysis.
MQA105P	Pharmaceutical quality assurance		



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Course Code	Course Name	CO	Course Outcome Statement
	Practical I	2	To build case studies and protocol of various processes of quality assurance and quality control
		3	To evaluate preformulation parameters, in process, finished product and packaging material quality.
F.Y.M.Pharm (SEM-I) Pharmaceutical Chemistry			
MPC102T	Advance Organic Chemistry 1		CO1: To understand the various intermediate formed in organic reactions and mechanisms of reactions
			CO2: To describe the mechanism & applications of various named reactions
			CO3: To discuss application of catalysts, Synthetic Reagents and protecting groups used in organic reactions
		H S Bhawar	CO4: To Explain the chemistry of heterocyclic compounds and to study Synthesis of few representative drugs containing these heterocyclic nucleus
			CO5: To elaborate the principles and applications of retrosynthesis and the concept of disconnection to develop synthetic routes for small target molecule
MPC 103T	ADVANCED MEDICINAL CHEMISTRY		CO1: To Understand the importance of drug design and different techniques of drug design.
		K V Dhamak	CO2: To Know design & development of Medicinal Chemistry drug study of Anti-hypertensive drugs, psychoactive drugs, Anticonvulsant drugs, H1 & H2 receptor antagonist, COX-1 & COX-2 inhibitors, Alzheimer's and Parkinson's disease, Antineoplastic and Antiviral agents.
			CO3: To Understand design and development of peptidomimetics.
			CO4: To Explain development of Rational Design of Enzyme Inhibitors
			CO5: To Understand the importance of Pro drug Design and Analog design
MPC 104 T	Chemistry of Natural Products	1	CO1: To understand different types of natural compounds and their chemistry and medical importance
		2	CO2: To apply the importance of natural compound as lead molecule for new drug discovery.





Course Code	Course Name	CO	Course Outcome Statement
		3	CO3: To analyze general methods of structural elucidation of compounds of natural origin
		4	CO4: To evaluate isolation, purification, and characterization of simple chemical constituent from natural source
MPC 105P	PHARMACEUTICAL CHEMISTRY PRACTICAL – I	1	To learn the concept of disconnection to develop synthetic routes for small target molecule.
		2	To understand and impart knowledge about recent advances in the field of medicinal chemistry at the molecular level including different techniques for the rational drug design.
		3	To learn designed to provide detail knowledge about chemistry of medicinal compounds from various reagents and general methods of structural elucidation of such compounds. It also emphasizes on isolation, purification and characterization of medicinal compounds
		4	To Explain development of different techniques of organic synthesis and their applications to process chemistry as well as drug discovery.
		5	To examine the importance of recent advances in the field of medicinal chemistry at the molecular level including different techniques for the rational drug design.
F.Y.M.Pharm (SEM-I) Pharmacognosy			
MPG102T	Advanced Pharmacognosy I	1	To get Brief knowledge about specific care in herbal material, & various approaches in extraction processes with their theoretical consideration, methodological steps, & applications.
		2	To Know various chromatographic & non- chromatographic separation methods.
		3	To understand theoretical source material & extraction methods of phytochemicals specified; and to draw schematic representation of such processes.
		4	To Study need of analysis of natural products & explain their significance; Understand & explain various parameters with their principles, significance & applications.





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MPG103T	Phytochemistry	1	To discuss the skills for Separation of the active constituents obtained from natural sources and different methods of separation .
		2	To identify the active ingredients and methods to evaluate natural components .
		3	To explain the actual process of Herbal Drug discovery and development.
		4	To compare and contrast extraction, Isolation and Phytochemical analysis of Natural products.
		5	To predict the principle of sophisticated instruments and To study of chromatographic fingerprinting methods
MPG104T	Industrial Pharmacognostical technology	1	To identify requirement for setting of herbal drug industry.
		2	To learn guidelines for quality and regulatory issues of herbal /natural medicines .
		3	To explain and compare general parameters of monographs of herbal drugs as per various pharmacopeia.
		4	To assess various clinical laboratory and stability testing of herbal drugs.
		5	To learn patenting of herbal/natural drugs.
MPG105T	Pharmacognosy Practical I	1	To illustrate the Pharmacopoeial compounds of natural origin and formulations by UV Vis spectrophotometer.
		2	To design Estimation of sodium/potassium by flame photometry
		3	To investigate Development of fingerprint of medicinal plant extracts used in herbal drug industry by TLC/HPTLC method.
		4	To identify the Methods of extraction and phytochemical screening
		5	To predict the Monograph analysis of clove oil and castor oil.





Course Code	Course Name	CO	Course Outcome Statement
F.Y.B.Pharm (SEM-II)			
BP201T	Human Anatomy & Physiology II	1	Describe significance of the different mechanisms that govern the normal working of various organs and systems as a whole.
		2	Explain Basic fundamentals structural features of neurons, mechanism of neurotransmitters along with processes of neuro conduction and neurotransmission, detailed structure of brains parts along with role of Autonomic Nervous System involved maintaining the body's order and stability.
		3	Name and describe various sense organs involved in our body to maintain homeostasis.
		4	Discuss basic organs and mechanism involved in respiration along with clinical significance and disorders of respiratory system.
		5	Explain the essentials of Urinary and endocrine system involved in regulation of Body functions & how all parts of the human body contribute to the maintenance of homeostasis.
BP202T	Pharmaceutical Organic Chemistry I	1	To Illustrate the structure, name and the type of isomerism of the organic compound.
		2	To Learn the reaction, name the reaction and orientation of reactions.
		3	To Discuss in detail the reactivity/stability of compound.
		4	To Identify/confirm the identification of organic compounds
BP203 T	Biochemistry	1	To Understand the significance, concepts of Cell and applications of biochemistry.
		2	To Describe the chemistry, biological functions of Carbohydrates, Lipids, Proteins, Vitamins and Amino acids.
		3	To Apply the mechanism of enzyme action and identify the classes of enzymes and factors affecting action, mechanism of electron transport chain
		4	To Explain the synthesis of nucleic acids, their role in metabolic pathways transcriptional, translational, and post- translational levels, Hereditary Diseases.



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Course Code	Course Name	CO	Course Outcome Statement
		5	To Discuss the metabolic pathways of Carbohydrates, Lipids, Proteins and Amino Acids
BP204 T	Pathophysiology	1	To describe the etiology and pathogenesis of the selected disease states
		2	To knowledge of signs and symptoms of the diseases
		3	To identify the complications of the diseases.
		4	To understand most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements
BP205 T	Computer Application in Pharmacy	1	To Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement
		2	To Design and develop solutions to analyze pharmaceutical problems using computers.
		3	To Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities
		4	To Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy .
BP206 T	Environmental sciences	1	To create awareness about environmental problems
		2	To impart basic knowledge about the environments and its allied problems
		3	To develop and attitude of concern for the environment.
		4	To strive to attain harmony with nature
BP207 P	Human Anatomy & Physiology II Practical	1	To Illustrate different parts of microscope and determine RBC Count, WBC count, Hb content, blood group.
		2	To Study histology of important tissues, cardiovascular system and human digestive system.
		3	To determine clotting time, bleeding time, blood pressure, body temperature, and pulse rate.





Course Code	Course Name	CO	Course Outcome Statement
		4	To determine ECG & explain its significance
		5	To observe hospital structure and working of blood bank qualitative analysis.
BP208P	Pharmaceutical Organic Chemistry I	1	To identify and access the unknown organic compound
		2	To synthesize solid derivatives from organic compounds.
		3	To construct the molecular models.
BP209 P	Biochemistry	1	To illustrate the concept of enzyme hydrolysis and examine the role of enzyme in day to day life.
		2	To understand the various qualitative tests for identification of biomolecules
		3	To identify the pH and blood constituents like blood sugar, blood creatinine and total serum cholesterol.
		4	To examine the reducing sugar by DNS method, proteins by Biuret method and urine abnormalities.
BP210 P	Computer Application in Pharmacy	1	To Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement
		2	To Design and develop solutions to analyze pharmaceutical problems using computers.
		3	To Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities.
		4	To Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy .
S.Y.B.Pharm (SEM-IV)			
BP401T	Pharmaceutical Organic Chemistry III	1	Understand the methods of preparation, properties, medicinal uses and other applications of organic compounds
		2	Explain the stereo chemical aspects of organic compounds and stereo chemical reaction
		3	Understand the properties of heterocyclic compounds with aromaticity and reactivity of





Course Code	Course Name	CO	Course Outcome Statement
			heterocyclic compounds
		4	Understand the basic terminologies in stereochemistry and organic reactions
BP402T	Medicinal Chemistry I	1	To understand [L2: Understand] history classification, structure and adverse effect of medicinally important compounds and study the path way of drug metabolism and designing of new molecule [L3: Apply] with its therapeutic application.
		2	To understand Theoretical [L1: Knowledge] and practical [L3: Apply] skills in synthesis of medicinal and study the Structure activity relationship of drug molecule
		3	Discuss the synthesis the medicinally important compound [L4: create] and perform purification process [L3: Application] guidelines.
BP403T	Physical Pharmaceutics-II	1	Knowledge [L1: Remembering]: Know the types, properties, purification, stabilization and applications of colloids in the formulations.
		2	Breadth [L2: Understanding]: Illustrate the different types of flow in order to identify and choose suitable flow characteristics for the formulation and study of deformation of solids. Understand the properties of particles and pharmaceutical powders, their significance in formulating pharmaceutical products, and the common methods for characterizing these properties and application in pharmacy
		3	Comprehension [L2: Understanding]: Illustrate the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations.
		4	Application [L3: Applying]: Analyze the behavior, physicochemical properties and mechanism of drugs and excipients in the formulation development and evaluation of dosage forms.
BP404T	Pharmacology I	1	Understand [L1: Remember] in detailed about Pharmacokinetics and pharmacodynamics along with the adverse effects, clinical uses, interactions, doses, contraindications and route of administration of different classes of drugs
		2	Understand [L2: Understanding] the drugs acting on the peripheral nervous system .
		3	Understand [L2: Understanding] the drugs acting on the central nervous system of the body
BP405T	Pharmacognosy I	1	To know the techniques in the cultivation and production of crude drugs.





Course Code	Course Name	CO	Course Outcome Statement
		2	To know the crude drugs, their uses and chemical nature.
		3	Know the evaluation techniques for the herbal drugs.
		4	To carry out the microscopic and morphological evaluation of crude drugs.
BP406P	Medicinal Chemistry I	1	Understand [L2: Understanding] structure and and study the path way of drug metabolism and designing of new molecule [L3: Applying] with its therapeutic application.
		2	Understand theoretical [L1: Remembering] and practical [L3: Applying] skills in synthesis of medicinal and study the Structure activity relationship of drug molecule
		3	Discuss the synthesis the medicinally important compound [L4: Creating] and perform purification process [L3: Applying] guidelines.
BP407P	Physical Pharmaceutics II	1	Determine [L3: Applying] of particle size, particle size distribution using different methods.
		2	Determine [L3: Applying] bulk density, true density, porosity angle of repose and viscosity of liquid using Ostwald's viscometer.
		3	Determine [L3: Applying] sedimentation volume with effect of different suspending agent
BP408P	Pharmacology I	1	Recall [Remember L1] the commonly used instruments & learn about common laboratory animals by simulation
		2	Understand [Understand L2] the common laboratory techniques blood withdrawal, serum, plasma separation and anesthetics by simulation
		3	Understand [Understand L2] the effect of drugs on ciliary motility of frog oesophagus and rabbit eye. Skeletal muscle relaxants activity using rota-rod apparatus and locomotor activity using actophotometer, Anticonvulsant effect, stereotype and anti-catatonic activity, anxiolytic activity, local anesthetics by different methods by simulation.
BP409P	Pharmacognosy I	1	Know [L2: Understanding] the techniques in the cultivation and production of crude drugs.
		2	Know [L2: Understanding] the crude drugs, their uses and chemical nature.



Principal



Course Code	Course Name	CO	Course Outcome Statement
		3	Examine [L4: Analyzing] microscopic and morphological evaluation of crude drugs.
		4	Evaluate [L5: Evaluating] techniques for the herbal drugs.
T.Y.B.Pharm (SEM- VI)			
BP 601 T	Medicinal Chemistry -II	1	:To illustrate of drug metabolizing enzymes, phase I &phase
		2	To illustrate Biosynthesis, release and metabolism of noradrenaline, Receptor subtypes, design of the drugs, history,classification, nomenclature, SAR, mechanism of action, therapeutic uses, adverse effects, synthesis of drugs and recentdevelopments in the CNS active drug
		3	To Explain design of the drugs, history, classification, nomenclature, SAR, mechanism of action, therapeutic uses, adverse effects, synthesis of drugs and recent developments inthe CNS Stimulants
		4	To Explain design of the drugs, history, classification, nomenclature, SAR, mechanism of action, therapeutic uses, adverse effects, synthesis of drugs and recent developments inthe CNS depressant
BP 607 P	Medicinal Chemistry -II	1	To analyze & Separate solvents or substances by steamdistillation.
		2	To synthesize the following drug a. Phenytoin frombenzoinb. Benzocaine from PABA
		3	To Explain method for synthesis of medicinally important organic compounds using microwave assisted organic synthesis
		4	To identify the synthesized compounds by Thin layer chromatography & purified of synthesized compound by Columchromatograpy.
BP 602 T	Pharmacology-III	1	To know pharmacology and pharmacotherapy ofvarious general and local anesthetics.
		2	To identify appropriate drug therapy and managementof patients with specific CNS disorders.





Course Code	Course Name	CO	Course Outcome Statement
		3	To understand the indications, mechanism of action, adverse effects and contraindications for the major classes of drugs used in the treatment of Parkinson's Disease, Migraine and Alzheimer's disease.
		4	To describe Pharmacological features.
BP 608 P	Pharmacology-III Practical	1	To understand the basic principles of bioassay, types of bioassay along with advantages and disadvantages.
		2	To know Performance of isolated experiments using various isolated preparation and the effect of different drugs on the concentration response curves.
		3	To study the preclinical screening of various drugs.
BP 605 T	Pharmaceutical Biotechnology	1	To study animal cell culture
		2	To explain different enzyme mobilization technique
		3	To understand different fermentation techniques
BP 604 T	Bio-pharmaceutics & Pharmacokinetics	1	To describe the concept of biopharmaceutics and its applications in formulation development.
		2	To explain and apply knowledge of pharmacokinetic processes designing pharmaceutical dosage form.
		3	To discuss the concepts of bioavailability and bioequivalence studies.
		4	To explain various compartmental models and non-compartmental analysis methods.
		5	To explain and apply concept and mechanisms of dissolution and in vitro in vivo correlation
BP606 T	Quality Assurance Techniques	1	To Describe the quality, quality assurance, quality control and IPQC in pharmaceutical industry
		2	To Explain the Calibration and Qualification in Quality
BP 603T	Herbal Drug	1	To explain herbal formulation and standardization technique
		2	To understand herbal cosmetics and standardization technique



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Course Code	Course Name	CO	Course Outcome Statement
	Technology	3	To understand screening of herbal drugs
BP 609P	Herbal Drug Technology	1	To understand preliminary Phytochemical investigation of crude drugs
		2	To explain isolation and Phytochemical identification of crude drug
		3	To Prepare herbal formulation
Final B.Pharm (SEM-VIII)			
BP801T	Biostatistics and Research Methodology	1	To develop the ability to apply the methods while working on a research project work
		2	To describe the appropriate statistical methods required for a particular research design
		3	To choose the appropriate research design and develop appropriate research hypothesis for a research project
		4	To develop an appropriate framework for research studies
BP802T	Social and Preventive Pharmacy	1	Illustrate sociocultural factors and its relation with health
		2	Explain the principles on the prevention and control of communicable and non-communicable diseases.
		3	Explain the general measures and strategies to be followed in social and preventive pharmacy
		4	Identify National health programs its objectives functioning and outcomes
F.Y.M.Pharm (SEM-II) Pharmaceutical Quality Assurance			
MQA201T	Hazards and safety Management	1	To explain Natural resources and associated problems
		2	To discuss Types of Hazards and its prevention.





Course Code	Course Name	CO	Course Outcome Statement
		3	To Classify chemical based hazards and their control measures.
		4	To describe and illustrate Fire and Explosion hazards and Preventive and protective management from fires and explosion
		5	To describe and compose Hazard and risk management
MQA202T	Pharmaceutical Validation	1	To describe various aspects of validation and IPR
		2	To discuss and apply the concepts of validation of equipment and instruments, analytical methods and cleaning processes in pharmaceutical manufacturing
		3	To discuss and Design validation documents, plant lay out of processing and testing area, check list for pharmaceutical manufacturing processes
MQA203T	Audits and regulatory compliance	1	To explain the importance of auditing.
		2	To compose the auditing report and check list for auditing
		3	To plan out the audit process.
		4	To compose the auditing report And check list for auditing.
		5	To illustrate the methodology of auditing
MQA204T	Pharmaceutical manufacturing technology	1	To identify the legal requirements and licenses for API & formulation industry and Justify the plant location factors influenced on API & formulation industry.
		2	To design & construct Non sterile manufacturing process technology in pharmaceutical industry
		3	To explain the importance of Quality by design (QbD) and process analytical technology in pharmaceutical industry.
		4	To design and construct aseptic process technology in pharmaceutical industry.
MQA205P	Pharmaceutical Quality assurance Practical II	1	To Validate equipment and instruments, analytical methods and cleaning processes
		2	To Design validation documents, plant lay out of processing and testing area, check list for pharmaceutical manufacturing processes
		3	To build case studies of various processes of quality assurance and quality



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Course Code	Course Name	CO	Course Outcome Statement
			control
		4	To Analyse quantitatively organic and inorganic constituents by using Instrumental Methods of Analysis
F.Y.M.Pharm (SEM-II) Pharmaceutical Chemistry			
MPC 201 T	Advanced spectral Analysis	1	To discuss interpretation of organic compound by using UV, IR, mass spectroscopy
		2	To understand theoretical technique of NMR spectroscopy and assess organic compound using NMR data
		3	To explain principle, instrumentation and application Chromatographic and its hyphenated analytical technique
		4	To illustrate principle, instrumentation and use of DTA, DTA and TGA.
		5	To discuss the general theory and principles of bioassay, ELISA and assess quantity of Digitalis and insulin
MPC202T	Advance Organic Chemistry 2	1	To discuss the principle of Green Chemistry and use techniques of green chemistry in synthesis of pharmaceutical compounds.
		2	To understand Chemistry of peptides and use solid phase and solution phase synthesis reaction for synthesis of pharmaceutical compounds.
		3	To learn principle and mechanism for photochemical and pericyclic reaction
		4	To explain basic concept of Stereochemistry & Asymmetric Synthesis using chiral pool, chiral auxiliaries.
		5	To classify and explain use of various catalyst in heterogeneous and homogeneous reactions and transitional phase transfer, and biocatalysis reactions.
MPC 203 T	Computer Aided Drug Design	1	To understand the role of CADD in drug discovery
		2	To describe different CADD techniques and their applications
		3	To analyze the various strategies to design and develop new drug like molecules.
		4	To illustrate working with molecular modeling software to design new drug molecules





Course Code	Course Name	CO	Course Outcome Statement
		5	To describe the in silico virtual screening protocols.
MPC 204T	Pharmaceutical Process Chemistry	1	To illustrate the process chemistry and stages of scale-up.
		2	To understand the unit operation extraction, filtration, distillation, evaporation
		3	To learn the unit process of nitration, halogenations, oxidation, reduction
		4	To explain the fermentation of antibiotic, vitamin, static
		5	To understand industrial safety and fire hazards safety assessment series
MPC 205P	PHARMACEUTICAL CHEMISTRY PRACTICAL – II	1	To learn the designed to provide in-depth knowledge about advances in organic chemistry, different techniques of organic synthesis and their applications to process chemistry as well as drug discovery
		2	To impart knowledge on the development and optimization of a synthetic route/s and described as scale up reactions, taking them from small quantities created in the research lab to the larger quantities
		3	To Understand designed to provide detail knowledge about chemistry of medicinal compounds from various reagents and general methods of structural elucidation of such compounds. It also emphasizes on isolation, purification and characterization of medicinal compounds
		4	To examine development of different techniques of organic synthesis and their applications to process chemistry as well as drug discovery
		5	To learn the importance of recent advances in the field of medicinal chemistry at the molecular level including different techniques for the rational drug design.
F.Y.M.Pharm (SEM-II) Pharmacognosy			
MPG201 T	Medicinal Plant Biotechnology	1	To provide students with the necessary skills to learn different methods of tissue culture





Course Code	Course Name	CO	Course Outcome Statement
		2	To study the various tissue culture techniques
		3	To explain the various immobilisation techniques and to study the metabolites
		4	To learn various biotransformation techniques
		5	To learn various fermentation techniques
MPG202 T	Advanced Pharmacognosy II	1	To assess the Efficacy of Herbal medicine products
		2	To discuss the methods of screening of herbals for various biological properties
		3	To investigate the analytical profiles
		4	To investigate the analytical profiles of herbal drugs of herbal drugs
		5	To examine ethnobotany in herbal drug evaluation and Impact of Ethnobotany in traditional medicine
MPG203T	Indian System of Medicine	1	Acquire knowledge of Primary concepts of traditional system of medicine as well as Formulation development and standardization of various traditional dosage forms
		2	Describe the Basic principles and healing potentials of Yoga, Naturopathy and Aromatherapy.
		3	The course aims to provide students with the necessary skills in learning and acquiring knowledge in Formulation, development and standardization of various traditional formulations.
		4	To study Good manufacturing skills in traditional drug industry & Safety monitoring of herbal medicines. CO5:-To explain the Concepts of AYUSH, AYUSH, ISM, CCRAS, CCRS, CCRH, CCRU.
MPG204T	Herbal Cosmetics	1	To understand the basic principles of herbal cosmetics
		2	To learn the current good manufacturing practices of herbal cosmetics
		3	To understand the various types of herbal cosmetics used.





Course Code	Course Name	CO	Course Outcome Statement
MPG205 P	Pharmacognosy-II	1	To illustrate the Isolation of nucleic acid.
		2	To design the Quantitative estimation of DNA,
		3	To identify total phenolic, total flavonoid content and total alkaloid content in herbal raw materials.
		4	To investigate the Preparation and standardization of various simple dosage forms from traditional medicine.
		5	To assess the herbal formulation and herbal cosmetic product.

