2.6.2 Attainment of programme outcome &course outcome

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
B PHARM	FIRST YEAR	PHARMACEUTICAL CHEMISTRY – I	To know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals. To understand the medicinal and pharmaceutical importance of inorganic compounds
		PHARMACEUTICAL CHEMISTRY-II	To write the structure, name and the type of isomerism of the organic compound To write the reaction, name the reaction and orientation of reactions,
		PHARMACEUTICS-I	To know the history of profession of pharmacy , understand the basics of different dosage forms, To understand the professional way of handling the prescription
		HUMAN ANATOMY AND PHYSIOLOGY	To explain the gross morphology, structure and functions of various organs of the human body. Identify the various tissues and organs of different systems of human body.
		PHARMACOGNOSY –I	To know the techniques in the cultivation and production of crude drugs To know the crude drugs, their uses and chemical nature & To know the evaluation techniques for the herbal drug
	SECOND YEAR	Pharmaceutical chemistry – III	To write the structure, name and the type of isomerism of the organic compound & write the reaction, name the reaction and orientation of reactions
		Pharmaceutical Analysis -	To understand the principles of volumetric and electro chemical analysis To carryout various volumetric and electrochemical titrations & to develop analytical skill
		Pharmaceutics –II	Theory and practical components of the subject help the student to get a better insight in to various areas of formulation research and development and stability studies of pharmaceuticals.
		Pathophysiology & Health Education	This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications,
		Mathematics, Biostatistics & Computer applications	To solve the different types of problems by applying theory & appreciate the important application of mathematics in Pharmacy To know the various types of application of computers in pharmacy & to know the various applications of databases in pharmacy
		Pharmaceutical Technology	To know various unit operations used in Pharmaceutical industries. 2. To understand the material handling techniques. 3. To perform various processes involved in pharmaceutical manufacturing process.
		Applied Biochemistry & Molecular Biology	The subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions.

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
B PHARM	THIRD YEAR	Pharmaceutics IV	To understand methods of identification, cultivation and preservation of various microorganisms & the importance of sterilization in microbiology
		Pharmaceutical Chemistry IV	Study of alkaloids steroids and cardiac glycosides. & estimation of drugs coming under alkaloids, antibiotics, vitamins & other pharmaceutically significant products of natural origin.
		Pharmacology – I	The subject covers the information about the drugs like, mechanism of action, pharmacodynamics as well as pharmacokinetics along with the adverse effects, clinical uses, and routes of administration of different classes of drugs.
		Pharmaceutics- V	This subject is designed to impart knowledge and skills necessary for dose calculations, dose Adjustments and to apply Biopharmaceutics theories in practical problem solving.
		Pharmaceutical Jurisprudence	To impart basic knowledge on several important legislations related to the profession of pharmacy in India.
		Pharmacognosy -II	To impart the students the knowledge of how the secondary metabolites are produced in the crude drugs, how to isolate and identify and produce them industrially.
		Pharmaceutical Management	To understand pharmaceutical industrial management and regulatory affairs
	FOURTH YEAR	Pharmaceutical chemistry – V	To understand the chemistry of drugs with respect to their pharmacological activity. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
		Pharmaceutical analysis -II	To understand the interaction of matter with electromagnetic radiations and its applications in drug analysis Perform quantitative & qualitative analysis of drugs using various analytical instruments.
		Pharmacognosy-III	This subject gives the student the knowledge of basic understanding of herbal drug industry, the quality of raw material, guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceuticals etc.
		Pharmaceutics VI	To know the various pharmaceutical dosage forms and their manufacturing techniques. Know various considerations in development of pharmaceutical dosage forms. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
		Pharmacology –II	This subject is intended to impart the fundamental knowledge on various aspects of drugs acting on different systems of body and in addition,emphasis on the basic concepts of bioassay.
		Pharmacy Practice	the students are required to learn various skills like drug distribution, drug information, and therapeutic drug monitoring for improved patient care
		Project work	

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
B PHARM	FIRST SEMESTER	Human Anatomy and Physiology I	To explain the gross morphology, structure and functions of various organs of the human body. Identify the various tissues and organs of different systems of human body.
		Pharmaceutical Analysis I–	To understand the principles of volumetric and electro chemical analysis To carry out various volumetric and electrochemical titrations & to develop analytical skill
		Pharmaceutics I	To know the history of profession of pharmacy , understand the basics of different dosage forms, To understand the professional way of handling the prescription
		Pharmaceutical Inorganic Chemistry	To know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals. To understand the medicinal and pharmaceutical importance of inorganic compounds
		Communication skills	This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other health workers.
		Remedial Biology/ Mathematics–	To solve the different types of problems by applying theory & appreciate the important application of mathematics in Pharmacy To learn and understand the components of living world, structure and functional system of plant and animal kingdom.
	SECOND SEMESTER	Human Anatomy and Physiology II	This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms.
		Pharmaceutical Organic Chemistry I	To write the structure, name and the type of isomerism of the organic compound To write the reaction, name the reaction and orientation of reactions,
		Biochemistry	The subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions.
		Pathophysiology	This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications,
		Computer Applications	To know the various types of application of computers in pharmacy & to know the various applications of databases in pharmacy
		Environmental sciences	To create the awareness about environmental problems among learners. Impart basic knowledge about the environment and its allied problems. Develop an attitude of concern for the environment

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
B PHARM	THIRD SEMESTER	Pharmaceutical Organic Chemistry II	Student shall be able to write the structure, name and the type of isomerism of the organic compound, write the reaction, name the reaction and orientation of reactions & account for reactivity/stability of compounds
		Physical Pharmaceutics I	Theory and practical components of the subject help the student to get a better insight in to various areas of formulation research and development and stability studies of pharmaceuticals.
		Pharmaceutical Microbiology	To understand methods of identification, cultivation and preservation of various microorganisms & the importance of sterilization in microbiology
		Pharmaceutical Engineering	To know various unit operations used in Pharmaceutical industries. 2. To understand the material handling techniques. 3. To perform various processes involved in pharmaceutical manufacturing process
	FOURTH SEMESTER	Pharmaceutical Organic Chemistry III	The student shall be able to understand the methods of preparation and properties of organic compounds ,explain the stereo chemical aspects of organic compounds and stereo chemical reaction& know the medicinal uses and other applications of organic compounds
		Medicinal Chemistry I	To understand the chemistry of drugs with respect to their pharmacological activity. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
		Physical Pharmaceutics II	
		Pharmacology I	The subject covers the information about the drugs like, mechanism of action, pharmacodynamics as well as pharmacokinetics along with the adverse effects, clinical uses, and routes of administration of different classes of drugs.
		Pharmacognosy I	To know the techniques in the cultivation and production of crude drugs To know the crude drugs, their uses and chemical nature & To know the evaluation techniques for the herbal drug

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
B PHARM	FIFTH SEMESTER	Medicinal Chemistry II	This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs.
		Formulative Pharmacy	To know the various pharmaceutical dosage forms and their manufacturing techniques. Know various considerations in development of pharmaceutical dosage forms. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality
		Pharmacology II	This subject is intended to impart the fundamental knowledge on various aspects of drugs acting on different systems of body and in addition,emphasis on the basic concepts of bioassay.
		Pharmacognosy II–	To impart the students the knowledge of how the secondary metabolites are produced in the crude drugs, how to isolate and identify and produce them industrially.
		Pharmaceutical Jurisprudence	To impart basic knowledge on several important legislations related to the profession of pharmacy in India.
	SIXTH SEMESTER	Medicinal Chemistry III	To understand the importance of drug design and different techniques of drugdesign. Understand the chemistry of drugs with respect to their biological activity. Know the metabolism, adverse effects and therapeutic value of drugs
		Pharmacology III	To understand the mechanism of drug action and its relevance in the treatment of different infectious diseases comprehend the principles of toxicology and treatment of various poisoningsand appreciate correlation of pharmacology with related medicalsciences
		Herbal Drug Technology	This subject gives the student the knowledge of basic understanding of herbal drug industry, the quality of raw material, guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceuticals etc.
		Biopharmaceutics and Pharmacokinetics	This subject is designed to impart knowledge and skills necessary for dose calculations, dose Adjustments and to apply Biopharmaceutics theories in practical problem solving.
		Pharmaceutical Biotechnology	To understanding the importance of Immobilized enzymes in Pharmaceutical Industries. Genetic engineering applications in relation to production of pharmaceuticals
		Quality Assurance	This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It covers the important aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs.

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
B PHARM	SEVENTH SEMESTER	Instrumental Methods of Analysis	To understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
		Industrial Pharmacy	This course is designed to impart fundamental knowledge on pharmaceutical product commercialization from laboratory to market
		Pharmacy Practice	The students are required to learn various skills like drug distribution, drug information, and therapeutic drug monitoring for improved patient care
		Novel Drug Delivery System	Student shall be able 1. To understand various approaches for development of novel drug delivery systems. 2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluatio
	EIGHTH SEMESTER	Biostatistics and Research Methodology	To understand how to select a research topic in his/her areas ofinterest.The fundamentals of collecting, analyzing and interpreting the relevant data. Different computational methods and software‘s facilitating research
		Social and Preventive Pharmacy	The purpose of this course is to introduce to students a number of health issues and their challenges. This course also introduced a number of national health programmes. The roles of the pharmacist in these contexts are also discussed.
		Pharmaceutical Marketing	The course aim is to provide an understanding of marketing concepts and techniques and the application of the same in the pharmaceutical industry
		Pharmaceutical Regulatory Science	fundamental knowledge on the regulatory requirements for approval of new drugs, drug products in regulated countries like US, EU, Japan, Australia and Canada. It prepares the students to learn in detail on the regulatory requirements, documentation requirements, and registration procedures for marketing the drug products in regulated countries.
		Pharmacovigilance	This paper will provide an opportunity for the student to learn about development of pharmacovigilance as a science, basic terminologies used in pharmacovigilance, global scenario of Pharmacovigilance, train students on establishing pharmacovigilance programme in an organization, various methods that can be used to generate safety data and signal detection
		Quality Control and Standardizations of Herbals	In this subject the student learns about the various methods and guidelines for evaluation and standardization of herbs and herbal drugs. The subject also provides an opportunity for the student to learn cGMP, GAP and GLP in traditional system of medicines.
		Computer Aided Drug	This subject is designed to provide detailed

		Design	knowledge of rational drug design process and various techniques used in rational drug design process.
		Cell and Molecular Biology	The course content will equip the students with adequate knowledge of the molecular process occurring within the cell and possibly pharmacological interventions into those processes
		Cosmetic Science	to: 1. Know the cosmetic principles to address the needs of cosmetic industry. 2. Understand formulation science and analytical techniques required to scientifically design and develop cosmetic products. 3. Explain the scientific and technical aspects, high standards of practice and professional ethics within the cosmetic and toiletries industry.
		Experimental Pharmacology	This subject is designed to impart the basic knowledge of preclinical studies in experimental animals including design, conduct and interpretations of results.
		Advanced Instrumentation Techniques	This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart advanced knowledge on the principles and instrumentation of spectroscopic and chromatographic hyphenated techniques. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.
		Project work	

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
PHARM D	FIRST YEAR	Human Anatomy and Physiology	This course is designed to impart a fundamental knowledge on the structure and functions of the human body. It also helps in understanding both homeostasis mechanisms and homeostatic imbalances of various body systems.
		Pharmaceutics	This course is designed to impart a fundamental knowledge on the art and science of formulating different dosage forms. It prepares the students for the most basic of the applied field of pharmacy

		Medicinal Biochemistry	to – a. understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases; b. know the metabolic process of biomolecules in health and illness (metabolic disorders); c. understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism;
		Pharmaceutical Organic Chemistry	This course is designed to impart a very good knowledge about a) IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds; b) Some important physical properties of organic compounds
		Pharmaceutical Inorganic Chemistry	to: a. under stand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals; b. know the analysis of the inorganic pharmaceuticals their applications; and c. appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.
		Remedial Mathematics/ Biology	Know Trignometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications; b) solve the problems of different types by applying theory; and c) appreciate the important applications of mathematics in pharmacyThis subject has been introduces to the pharmacy course in order to make the student aware of various naturally occurring drugs and its history, sources, classification, distribution and the characters of the plants and animals. This subject gives basic foundation to Pharmacognosy
	SECOND YEAR	Pathophysiology	To a) describe the etiology and pathogenesis of the selected disease states; b) name the signs and symptoms of the diseases; and c) mention the complications of the diseases.
		Pharmaceutical Microbiology	to – a. know the anatomy,

			identification, growth factors and sterilization of microorganisms; b. know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect; c. do estimation of RNA and DNA and there by identifying the source;
		Pharmacognosy&Phytopharmaceuticals	understand the basic principles of cultivation, collection and storage of crude drugs; b. know the source, active constituents and uses of crude drugs; and c. appreciate the applications of primary and secondary metabolites of the plant.
		Pharmacology-I	understand the pharmacological aspects of drugs falling under the above mentioned chapters; b. handle and carry out the animal experiments; c. appreciate the importance of pharmacology subject as a basis of therapeutics; and d. correlate and apply the knowledge therapeutically.
		Community Pharmacy	know pharmaceutical care services; b. know the business and professional practice management skills in community pharmacies; c. do patient counselling & provide health screening services to public in community pharmacy; d. respond to minor ailments and provide appropriate medication;
		Pharmacotherapeutics-I	the pathophysiology of selected disease states and the rationale for drug therapy; b. the therapeutic approach to management of these diseases; c. the controversies in drug therapy; d. the importance of preparation of individualised therapeutic plans based on diagnosis
	THIRD YEAR	Pharmacology-II	a. understand the pharmacological aspects of drugs falling under the above mentioned chapters, b. carry out the animal experiments confidently, c. appreciate the importance of pharmacology subject as a basis of therapeutics, and d. correlate and apply the knowledge therapeutically.
		Pharmaceutical Analysis	To understand

			chromatyograhy,spectroscopy
		Pharmacotherapeutics-II	a. know the pathophysiology of selected disease states and the rationale for drug therapy b. know the therapeutic approach to management of these diseases; c. know the controversies in drug therapy; d. know the importance of preparation of individualised therapeutic plans based on diagnosis
		Pharmaceutical Jurisprudence	a. practice the Professional ethics; b. understand the various concepts of the pharmaceutical legislation in India; c. know the various parameters in the Drug and Cosmetic Act and rules;
		Medicinal Chemistry	Modern concept of rational drug design: A brief introduction to Quantitative Structure Activity Relationaship (QSAR), prodrug, combinatorial chemistry and computer aided drug design
		Pharmaceutical Formulations	a. understand the principle involved in formulation of various pharmaceutical dosage forms; b. prepare various pharmaceutical formulation; c. perform evaluation of pharmaceutical dosage forms
	FOURTH YEAR	Pharmacotherapeutics-III	a. the pathophysiology of selected disease states and the rationale for drug therapy; b. the therapeutic approach to management of these diseases; c. the controversies in drug therapy
		Hospital Pharmacy	know various drug distribution methods; know the professional practice management skills in hospital pharmacies; provide unbiased drug information to the doctors;
		Clinical Pharmacy	a. monitor drug therapy of patient through medication chart review and clinical review; b. obtain medication history interview and counsel the patients; c. identify and resolve drug related problems; d. detect, assess and monitor adverse drug reaction
		Biostatistics & Research Methodology	Types of clinical study designs: Case studies, observational studies, interventional studies, b. Designing the methodology c. Sample size

			determination and Power of a study Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study
		Biopharmaceutics & Pharmacokinetics	This subject is designed to impart knowledge and skills necessary for dose calculations, dose Adjustments and to apply Biopharmaceutics theories in practical problem solving.
		Clinical Toxicology	General principles involved in the management of poisoning 2. Antidotes and the clinical applications. 3. Supportive care in clinical Toxicology. 4. Gut Decontamination.
	FIFTH YEAR	Clinical research	To study clinical development &processes of drugs
		Pharmacoepidemiology and pharmacoeconomics	Origin and evaluation of pharmacoepidemiology need for pharmacoepidemiology, aims and applications.
		Clinical pharmacokinetics and therapeutic drug monitoring	Nomograms and Tabulations in designing dosage regimen, Conversion from intravenous to oral dosing, Determination of dose and dosing intervals, Drug dosing in the elderly and pediatrics and obese patients
	SIXTH YEAR	Internship	

COURSE	YEAR/SEMESTER	SUBJECT	LEARNING OUTCOME
PHARM D PB	FIRST YEAR	PHARMACOTHERAPEUTICS I & II	The pathophysiology of selected disease states and the rationale for drug therapy and therapeutic approach to management of these diseases. The importance of preparation of individualised therapeutic plans based on diagnosis and the needs to identify the patient-specific parameters relevant in initiating drug therapy
		PHARMACOTHERAPEUTICS III	The therapeutic approach to management of these diseases.The controversies in drug therapy. It describe the pathophysiology of selected disease states and explain the rationale for drug therapy.To summarize the therapeutic approach to management of these diseases

			including reference to the latest available evidence
		HOSPITAL PHARMACY	To know various drug distribution methods and to know the professional practice management skills in hospital pharmacies.To provide unbiased drug information to the doctors and to know the manufacturing practices of various formulations in hospital set up. The practice based research methods appreciate the stores management and inventory control.
		CLINICAL PHARMACY	To monitor drug therapy of patient through medication chart review and clinical review.Toobtain medication history interview and counsel the patients.To identify and resolve drug related problems and to detect, assess and monitor adverse drug reaction; e.
		BIOSTATISTICS AND RESEARCH METHODOLOGY	Types of clinical study designs:Case studies, observational studies, interventional studies. Designing the methodology.Sample size determination and Power of a study .Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study
PHARM D(PB)	SECOND YEAR	Clinical Research	. Drug development process Clinical development of drug
		Pharmacoepidemiology and Pharmacoeconomics	Measurement of outcomes in pharmacoepidemiology Pharmacoepidemiological methods
		Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	Design of dosage regimens Pharmacokinetics of Drug Interaction Therapeutic Drug monitoring
PHARM D(PB)	THIRD YEAR	INTERNSHIP	

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
M PHARM (PHARM.CHEMISTRY)	FIRST YEAR	Modern analytical and research methods	Spectrum study Stastitical analysis
		Advanced medicinal chemistry	A brief study of molecular biology of receptors, drug receptor theories including receptor binding assays,drug design
		Advanced organic chemistry	Bonding and electron distribution Introduction to stereo chemistry
		CHEMISTRY OF NATURAL PRODUCTS	General methods of isolation and separation of plant constituents, qualitative reactions for the detection of plant constituents
	SECOND YEAR	RESEARCH WORK	
M PHARM (PHARMACY PRACTICE)	FIRST YEAR	Modern analytical and research methods	Spectrum study Stastitical analysis
		Clinical pharmacy practice and hospital pharmacy	To study ndaily activities of a clinical pharmacist Patient data analysis
		Clinical research & community pharmacy	To study Drug Discovery and drug Development Data Management in clinical Research
		Pharmacotherapeutics	Pathophysiology and applied therapeutics of diseases like Haematological diseases, Psychiatric disorders
	SECOND YEAR	RESEARCH WORK	
M PHARM (PHARMACOLOGY)	FIRST YEAR	Modern analytical and research methods	Spectrum study Stastitical analysis
		Pharmacological screening methods and drug development	Principles of experimental pharmacology. Bioassays, Microbial assay of antibiotics. Screening for antimicrobial activity.
		Biochemical &molecular pharmacology	Biochemical mechanisms of cell injury Endogenous bioactive molecules
		Recent advances in pharmacology	Molecular mechanisms of drug action Novel target sites
	SECOND YEAR	RESEARCH WORK	

COURSE	YEAR/ SEM	SUBJECT	LEARNING OUTCOME
M PHARM (PHARM.CHEMISTRY)	FIRST SEMESTER	Modern Pharmaceutical Analytical Techniques	• The analysis of various drugs in single and combination dosage forms • Theoretical and practical skills of the instruments
		Advanced Organic Chemistry –I	The principles and applications of reterosynthesis • The mechanism & applications of various named reactions • The concept of disconnection to develop synthetic routes for small target molecule. • The various catalysts used in organic reactions
		Advanced Medicinal Chemistry	• Different stages of drug discovery • Role of medicinal chemistry in drug research • Different techniques for drug discovery • Various strategies to design and develop new drug like molecules for biological targets • Peptidomimetics
		Chemistry of Natural Products	Different types of natural compounds and their chemistry and medicinal importance • The importance of natural compounds as lead molecules for new drug discovery • The concept of rDNA technology tool for new drug discovery • General methods of structural elucidation of compounds of natural origin
	SECOND DSEMESTER	Advanced Spectral Analysis	• Interpretation of the NMR, Mass and IR spectra of various organic compounds • Theoretical and practical skills of the hyphenated instruments • Identification of organic compounds
		Advanced Organic Chemistry –I	• The principles and applications of Green chemistry • The concept of peptide chemistry. • The various catalysts used in organic reactions • The concept of stereochemistry and asymmetric synthesis.
		Computer Aided Drug Design	Role of CADD in drug discovery • Different CADD techniques and their applications • Various strategies to design and develop new drug like molecules. • Working with molecular modeling

			softwares to design new drug molecules
		Pharmaceutical Process Chemistry	• The strategies of scale up process of apis and intermediates • The various unit operations and various reactions in process chemistry
	THIRD SEMESTER	Research Methodology and Biostatistics*	General Research Methodology: Research, objective, requirements, practical difficulties, review of literature, study design, Biostatistics
	FOURTH SEMESTER	RESEARCH WORK	
M PHARM (PHARMACY PRACTICE)	FIRST SEMESTER	Clinical Pharmacy Practice	Understand the elements of pharmaceutical care and provide comprehensive patient care services • Interpret the laboratory results to aid the clinical diagnosis of various disorders • Provide integrated, critically analyzed medicine and poison information to enable healthcare professionals in the efficient patient managemen
		Pharmacotherapeutics1	• Describe and explain the rationale for drug therapy Summarize the therapeutic approach for management of various disease conditions including reference to the latest available evidence
		Hospital & Community Pharmacy	• Understand the organizational structure of hospital pharmacy • Understand drug policy and drug committees • Know about procurement & drug distribution practices • Know the admixtures of radiopharmaceuticals
		Clinical Research	• Know the new drug development process. • Understand the regulatory and ethical requirements. • Appreciate and conduct the clinical trials activities • Know safety monitoring and reporting in clinical trials
	SECOND SEMESTER	Principles of Quality use of Medicines	• Understand the principles of quality use of medicines • Know the benefits and risks associated with use of medicines • Understand regulatory aspects of quality use of medicines
		Pharmacotherapeutics II	• Describe and explain the rationale for drug therapy •

			Summarize the therapeutic approach for management of various disease conditions including reference to the latest available evidence • Discuss the clinical controversies in drug therapy and evidence based medicine • Prepare individualized therapeutic plans based on diagnosis
		Clinical Pharmacokinetics and therapeutic Drug Monitoring	• Design the drug dosage regimen for individual patients • Interpret and correlate the plasma drug concentrations with patients' therapeutic outcomes • Recommend dosage adjustment for patients with renal/ hepatic impairment • Recommend dosage adjustment for paediatrics and geriatrics • Manage pharmacokinetic drug interaction
		Pharmacoepidemiology & Pharmacoeconomics	Understand the various epidemiological methods and their applications • Understand the fundamental principles of Pharmacoeconomics. • Identify and determine relevant cost and consequences associated with pharmacy products and services. • Perform the key Pharmacoeconomics analysis methods
	THIRD SEMESTER	Research Methodology and Biostatistics*	General Research Methodology: Research, objective, requirements, practical difficulties, review of literature, study design, Biostatistics
	FOURTH SEMESTER	RESEARCH WORK	
M PHARM (PHARMACOLOGY)	FIRST SEMESTER	Modern Pharmaceutical Analytical Techniques	• Chemicals and Excipients • The analysis of various drugs in single and combination dosage forms • Theoretical and practical skills of the instruments
		Advanced Pharmacology-I	• Discuss the pathophysiology and pharmacotherapy of certain diseases • Explain the mechanism of drug actions at cellular and molecular level • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases

		Pharmacological and Toxicological Screening Methods-I	• Appraise the regulations and ethical requirement for the usage of experimental animals. • Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals • Describe the various newer screening methods involved in the drug discovery proces
		Cellular and Molecular Pharmacology	• Explain the receptor signal transduction processes. • Explain the molecular pathways affected by drugs. • Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
	SECOND SEMESTER	Advanced Pharmacology II	• Explain the mechanism of drug actions at cellular and molecular level • Discuss the Pathophysiology and pharmacotherapy of certain diseases • Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
		Pharmacological and Toxicological Screening Methods –II	• Explain the various types of toxicity studies. • Appreciate the importance of ethical and regulatory requirements for toxicity studies. • Demonstrate the practical skills required to conduct the preclinical toxicity studies.
		Principles of Drug Discovery	• Explain the various stages of drug discovery. • Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery • Explain various targets for drug discovery
		Clinical research and Pharmacovigilance	• Explain the regulatory requirements for conducting clinical trial • Demonstrate the types of clinical trial designs • Explain the responsibilities of key players involved in clinical trials • Execute safety monitoring, reporting and close-out activities • Explain the principles of Pharmacovigilance
	THIRD SEMESTER	Research Methodology	General Research Methodology:

		and Biostatistics*	Research, objective, requirements, practical difficulties, review of literature, study design, Biostatistics
	FOURTH SEMESTER	RESEARCH WORK	