



SHREE DHANVANTARY PHARMACY COLLEGE

Course Outcome (B.Pharm)

Semester-I

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME	
I	101.1	BP101TP	HUMAN ANATOMY AND PHYSIOLOGY-I	101.1.1	Identification of various cells, tissues and organs of different systems of human body
				101.1.2	Gross morphology, structure and functions of various organs of the human body like skeleton, joints and Integumentary system.
				101.1.3	Various homeostatic mechanisms and their imbalances, along with anatomy and physiology of heart related to it.
				101.1.4	Various experiments related to special senses and nervous system.
	101.2	BP102TP	PHARMACEUTICAL ANALYSIS I	101.2.1	Understand the introduction and highlights of pharmaceutical analysis and regulatory requirements.
				101.2.2	Theoretical aspects, separation techniques discussed with relevant examples of pharmaceutical products involving principles and techniques of separation of drugs from excipients



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				101.2.3	Theoretical aspects, instrumentation of data/spectra and analytical applications to be discussed on electrometric methods
				101.2.4	The theoretical aspects, instrumentation, elements of interpretation of data and application of analytical techniques (spectroscopy)
101.3	BP103TP	PHARMACEUTICS- I	101.3.1	Know the history of profession of pharmacy	
			101.3.2	Understand the professional way of handling the prescription	
			101.3.3	Preparation of various conventional dosage forms	
			101.3.4	Understand the pharmaceutical calculation	
101.4	BP104TP	PHARMACEUTICAL INORGANIC CHEMISTRY	101.4.1	Understand the introduction of inorganic chemistry	
			101.4.2	Understand the sources of impurities and various tests	
			101.4.3	Understand the medicinal and pharmaceutical importance of inorganic compounds	
			101.4.4	Develop skill to determine the impurities in inorganic compounds	
101.5	BP105TP	COMMUNICATION SKILLS	101.5.1	Understand the behavioural needs for a Pharmacist to function effectively in the areas of	



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					Pharmaceutical operation
				101.5.2	Understand the of effective communication (verbal and Non Verbal)
				101.5.3	Effectively manage team as a Team player
				101.5.4	Development of interview skill, leadership Quality and Essentials
	101.6	BP106TP	REMEDIAL BIOLOGY	101.6.1	Know the classification and silent feature of five kingdoms of life and understand the basic components and modifications in plants
				101.6.2	To know the information regarding cells and different types of tissues
				101.6.3	Know and understand the basic components of anatomy and physiology of various system(Cardiovascular system, Nervous system, Respiratory system, Endocrine system etc.) with special reference to human
				101.6.4	To know about different plant and mineral nutrition, plant respiration and photosynthesis
	101.7	BP107TT	REMEDIAL MATHEMATICS	101.7.1	Know the theory and their application in Pharmacy
				101.7.2	Solve the different types of problems by applying theory
				101.7.3	Appreciate the important application of mathematics in Pharmacy



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				101.7.4	Understand the concept of Analytical Geometry, Differential Equation, etc. Apply the knowledge of mathematics in pharmaceutical calculations
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Semester-II

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME	
II	102.1	BP201TP	HUMAN ANATOMY PHYSIOLOGY-II	102.1.1	To know the knowledge of anatomy as well as physiology of nervous system.
				102.1.2	To understand the anatomy and physiology of Digestive system
				102.1.3	To understand the anatomy and physiology of respiratory and urinary system.
				102.1.4	To understand the concept of various hormones and know the anatomy and physiology of reproductive system.
	102.2	BP202TP	PHARMACEUTICAL ORGANIC CHEMISTRY-II	102.2.1	Understand the classification of organic compounds and IUPAC system up to 10 carbons and isomers.
				102.2.2	Understand the reactivity, stability and method of preparation of hydrocarbons & appreciate the reaction orientation rules such as Saytzeff and Markownikoff rules.



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				102.2.3	Understand the reactivity, method of preparation, name reaction, structure and use of alkyl halide and identify the organic compounds.
				102.2.4	Understand the reactivity, method of preparation, name reaction, structure and use of carbonyl compounds and amines and identify the organic compounds.
102.3	BP203TP	PHARMACEUTICAL ENGINEERING	102.3.1	Understand the theoretical concepts and principles of manometers and mechanisms of size reduction and size separation	
			102.3.2	Understand the basic concepts of evaporation and study the during rule and Raoult's law. Study the various law related to distillation and heat transfer, theoretical concepts of various distillation process.	
			102.3.3	Study of various dryers and the rate of drying curve and various parameters related it and factors affecting mixing	
			102.3.4	Understand the theoretical concepts and principles used in Filtration and centrifugation, different types of filters and centrifuges. To understand material handling technique.	
		COMPUTER	102.4.1	To understand Number System,	



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	102.4	BP204TP	APPLICATION IN PHARMACY		concept of Information Systems and Software.
				102.4.2	To understand Web Technologies.
				102.4.3	To know the various application of computer in Pharmacy.
				102.4.4	To know various types of Databases and its application that applies in Pharmacy.
	102.5	BP205TT	ENVIRONMENTAL SCIENCES	102.5.1	Understand the awareness and knowledge about environment
				102.5.2	Acquire skill to help the concerned individuals in identifying and solving environment problems
				102.5.3	Motivate learner to participate in environment protection and environment improvement
				102.5.4	Impart basic knowledge about environment problems among learner

Semester-III

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME
III	103.1	BP301TP	PHARMACEUTICAL ORGANIC CHEMISTRY - II	103.1.1 Understand the reactivity, method of preparation, orientation of reaction, name reaction, structure and use of Benzene and its derivatives.



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				103.1.2	Understand the reactivity, method of preparation, name reaction, structure and use of Phenols, Aromatic Amines and Aromatic Acids.
				103.1.3	Understand the reactions and stability of fats and oils.
				103.1.4	Understand the reactivity, method of preparation, name reaction, synthesis, structure and use of Polynuclear hydrocarbons and stability, isomerism and preparation of Cycloalkanes.
	103.2	BP302TP	PHYSICAL PHARMACEUTICS-I	103.2.1	Study of various parameters related solubility of drug and factors affecting solubility of solid in liquid and gases in liquid.
				103.2.2	Study of state of matter and physical and chemical properties of drug molecules
				103.2.3	Understand concepts of surface and interfacial tension.
				103.2.4	Study the various method related to complexation ,theoretical concepts of protein binding and Understand the concepts of pH scale, buffers an isotonic solution



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	103.3	BP303TP	BIOCHEMISTRY	103.3.1	Understand the nutrient Molecules and metabolism of carbohydrates molecules in physiological and pathological condition. And bioenergetics.
				103.3.2	Understand the metabolism of Lipids and Amino acid in physiological and pathological condition.
				103.3.3	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and Proteins.
				103.3.4	Understand the catalytic role of enzyme, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic application of enzymes.
	103.4	BP304TP	PHARMACOGNOSY AND PHYTOCHEMISTRY-I	103.4.1	To understand the history, scope and development of pharmacognosy along with classification and evaluation of crude drugs
				103.4.2	To Understand the concepts of cultivation, collection, processing and storage of crude drug



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				103.4.3	To get knowledge about the introduction of primary and secondary metabolites
				103.4.4	To understand the concept of plant tissue culture, fibers and marine drugs
	103.5	BP305TT	PATHOPHYSIOLOGY	103.5.1	Identify and Explain the etiology of human diseases.
				103.5.2	Identify & Explain the Pathogenesis of human diseases.
				103.5.3	Have the ability to identify signs & symptoms of selected diseases.
				103.5.4	Able to know diagnostic method of selected human diseases.

Semester-IV

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME	
IV	104.1	BP401TT	PHARMACEUTICAL ORGANIC CHEMISTRY - III	104.1.1	Understand the Stereo isomerism, Optical isomerism.
				104.1.2	Understand the Geometric isomerism and Stereo Chemical reactions of Chiral molecules.
				104.1.3	Understand the Chemistry, Nomenclature and Classification of Heterocyclic compound and Understand the Synthesis, Reaction



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					and Medicinal uses of Heterocyclic compound derivatives.
				104.1.4	Understand the Reaction of synthesis of oxidation and reduction reaction of Organic Compounds.
	104.2	BP402TP	MEDICINAL CHEMISTRY-I	104.2.1	Understand the Medicinal chemistry in drug development and drug metabolism and physicochemical relation in biological action.
				104.2.2	Understand the Chemistry of drugs with their pharmacological activity, metabolic pathway, Mechanism of action, SAR, Synthesis, Side effects of Drug acting on Autonomic Nervous system.
				104.2.3	Understand the Chemistry of drugs with their pharmacological activity, metabolic pathway, Mechanism of action, SAR, Synthesis, Side effects of Drug acting on Central Nervous system.
				104.2.4	Understand the Chemistry of drugs with their pharmacological activity, metabolic pathway, Mechanism of action, SAR, Synthesis, Side effects of General



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					anesthetic agents.
104.3	BP403TP	PHYSICAL PHARMACEUTICS II	104.3.1	Understand various physicochemical properties of drug molecules in the designing the dosage forms	
			104.3.2	Understand various rheological properties of emulsion and suspension.	
			104.3.3	To study dispersed systems and their characteristics.	
			104.3.4	Know the principles of chemical kinetics & to use them for stability testing.	
104.4	BP404TP	PHARMACOLOGY-I	104.4.1	Understand the pharmacological actions of different categories of drugs and explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels	
			104.4.2	Understand the basic pharmacological knowledge in the prevention and treatment of various diseases.	
			104.4.3	Observe the effect of drugs on animals by simulated experiments	
			104.4.4	Recognize correlation of pharmacology with other bio medical sciences	
			104.5.1	Understand the pharmaceutical legislations and their implications	



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	104.5	BP405TT	PHARMACEUTICAL JURISPRUDENCE		in development and marketing of pharmaceuticals
				104.5.2	Understand various Indian pharmaceuticals acts and laws
				104.5.3	Understand the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
				104.5.4	Understand the code of ethics during the pharmaceutical practice

Semester-V

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME	
V	105.1	BP501TT	MEDICINAL CHEMISTRY - II	105.1.1	Explain chemistry of drugs with respect to their pharmacological activity, drug metabolic pathways, adverse effect and therapeutic value for Chemotherapeutic agents, drug acting on immune system, cardiovascular system.
				105.1.2	Acquire knowledge about the relationship between the biological activity and structure of chemotherapeutic agents and drug acting on immune and cardiovascular system. Outline the synthetic route for the



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					selective medicinal compounds of each category, chemotherapeutic agents and drug acting on Immune system, cardiovascular system.
				105.1.3	Explain chemistry of drugs with respect to their pharmacological activity, drug metabolic pathways, adverse effect and therapeutic value for drug acting on endocrine system, CNS and Miscellaneous class.
				105.1.4	Acquire knowledge about the relationship between the biological activity and structure of drug acting on endocrine system, CNS. Outline the synthetic route for the selective medicinal compounds of each category, drug acting on endocrine system, CNS and Miscellaneous class.
	105.2	BP502TP	PHARMACOLOGY II	105.2.1	Understand the mechanism of drug action and its relevance in the treatment of different diseases, various receptor actions using isolated tissue preparation
				105.2.2	Correlation of pharmacology with related medical sciences



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				105.2.3	Understand the mechanism of drug action and its relevance in the treatment of different diseases
				105.2.4	Understand the mechanism of drug action and its relevance in the treatment of different diseases , correlation of pharmacology with related medical sciences
105.3	BP503TP	PHARMACOGNOSY & PHYTOCHEMISTRY II	105.3.1	To know modern extraction technique, characterization & identification of herbal drugs	
			105.3.2	To understand the preparation & development of herbal formulation	
			105.3.3	To understand the herbal drug interactions	
			105.3.4	To carryout isolation & identification of phytoconstituents.	
105.4	BP504TP	PHARMACEUTICAL MICROBIOLOGY	105.4.1	Understand the introduction to Microbiology, Microscopy and detailed description about Bacteria, Virus and Fungi	
			105.4.2	Understand the Concepts involve in various staining technique, Sterilization and Disinfectants	
			105.4.3	Knowledge of aseptic area various Sterility, Standardization and Microbial assay methods.	



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				105.4.4	Understand the concept of Microbial Spoilage ,Contaminants and method for Preservation
105.5	BP505TP	PHARMACEUTICAL BIOTECHNOLOGY		105.5.1	Understanding the importance of immobilized enzymes in pharmaceutical industries.
				105.5.2	Genetic engineering application in relation to production of pharmaceuticals.
				105.5.3	Importance of monoclonal antibodies in industries.
				105.5.4	Appreciate the use of microorganisms in fermentation technology.
				105.6.2	
				105.6.3	
				105.6.4	

Semester-VI

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME	
VI	106.1	BP601TT	MEDICINAL	106.1.1	Understand the Historical background, Nomenclature, Stereochemistry, Structure activity relationship, Chemical degradation classification and important products of the antibiotics like Beta lactum, Tetracycline, Amino glycoside and Micolide.



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			CHEMISTRY-II	106.1.2	Understand the Chemistry of drugs with their pharmacological activity, metabolic pathway, Mechanism of action, SAR, Synthesis, Side effects of Anti-malarial and Pro drug.
				106.1.3	Understand the Chemistry of drugs with their pharmacological activity, metabolic pathway, Mechanism of action, SAR, Synthesis, Side effects of Anti tubercular, Anti-viral, Urinary tract infection and Anti-Fungal.
				106.1.4	Understand the Drug Design and Combinatorial Chemistry.
106.2	BP602TP	PHARMACOLOGY -III		106.2.1	Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases.
				106.2.2	To understand principles of toxicology and treatment of various poisonings and Drugs.
				106.2.3	Student should be able to correlation of pharmacology with related medical sciences, understand the mechanism of drug action and its relevance in the treatment of different infectious diseases.
				106.2.4	Student should be able to correlation of pharmacology with related medical sciences.



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	106.3	BP603TP	HERBAL DRUG TECHNOLOGY	106.3.1	To understand raw material as source of herbal drugs from cultivation to herbal drug product
				106.3.2	To know the WHO and ICH guidelines for evaluation of herbal drugs
				106.3.3	To know the herbal cosmetics, natural sweeteners, nutraceuticals
				106.3.4	To appreciate patenting of herbal drugs, GMP.
	106.4	BP604TT	BIOPHARMACEUTICS AND PHARMACOKINETICS	106.4.1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
				106.4.2	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
				106.4.3	To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
				106.4.4	Understand various pharmacokinetic parameters, their significance & applications.
	106.5	BP605TP	INDUSTRIAL	106.5.1	Study of physicochemical characteristics of drug substances.
				106.5.2	Know the various pharmaceutical dosage forms and their manufacturing Techniques



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			PHARMACY I	106.5.3	Know various considerations in development of pharmaceutical dosage forms
				106.5.4	Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.

Semester-VII

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME	
VII	107.1	BP701TT	INSTRUMENTAL METHODS OF ANALYSIS	107.1.1	The content will lead to the understanding to Fundamentals of Spectroscopy and Theory and Practical concept of UV Spectroscopy and Fluorimetry
				107.1.2	The content will lead to the understanding in detail about Theory and Practical concept of Fluorescence spectroscopy, Flame Photometry, Atomic absorption spectroscopy and Nepheloturbidometry
				107.1.3	The content will lead to the understanding fundamentals of Chromatography and different Chromatography technique like Adsorption and partition column chromatography, Thin layer chromatography, Paper



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					chromatography, Electrophoresis
				107.1.4	The content will lead to the understanding in Detail about Theory and Practical concept of Gas chromatography, High performance liquid chromatography, Ion exchange chromatography, Gel chromatography
107.2	BP702TT	INDUSTRIAL PHARMACY II	107.2.1	To Know the process of pilot plant and scale up of pharmaceutical dosage forms	
			107.2.2	Understand the process of technology transfer from lab scale to commercial batch	
			107.2.3	Know different Laws and Acts that regulate pharmaceutical industry	
			107.2.4	Understand the approval process and regulatory requirements for drug products	
107.3	BP703TT	PHARMACY PRACTICE	107.3.1	Students will demonstrate knowledge of and ability to use principles of therapeutics, quality improvement, communication, economics, health behaviour, social and administrative aspects, health policy and legal issues in the practice of pharmacy.	
			107.3.2	Students will provide patient-centred care to diverse patients using the best available evidence and monitor drug therapy of patient through medication	



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					chart review, obtain medication history interview and counsel the patients, identify drug related problems. Students will use knowledge of drug distribution methods in hospital and apply it in the practice of pharmacy.
				107.3.3	Students will exhibit professional ethics by producing safe and appropriate medication use throughout society.
				107.3.4	Students will engage in innovative activities by making use of the knowledge of clinical trials .Students will effectively apply principles of drug store management and inventory control to medication use.
107.4	BP704TT	NDDS	107.4.1	To understand the design of controlled drug delivery system and polymers used in CRDDS	
			107.4.2	Formulation & Evaluation of microspheres, microcapsules, Muosal, Implantable and transdermal drug delivery system	
			107.4.3	Formulation & Evaluation of Gasoretentive, Nasopulmonary drug delivery system	
			107.4.4	Formulation & Evaluation targeted, ocular and intrauterine drug delivery system	
			107.6.1	To understand basic concepts of Quality Control, Quality assurance, GMP,	



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107.6	BP706TT	QUALITY ASSURANCE		Quality Management & importance of ICH guidelines, ISO certification
			107.6.2	To understand GMP aspects in Pharmaceutical Industry
			107.6.3	To study GLP aspects, complaints , recalling & Warehousing of goods
			107.6.4	To evaluate importance of Documentation, SOPs, Quality audit, Calibration & Validation

Semester-VIII

SEM	NBA CODE	SUBJECT CODE	SUBJECT	COURSE OUTCOME	
VI	108.1	BP801TT	BIostatistics AND RESEARCH METHODOLOGY	108.1.1	Understand the basic concepts of biostatistics, biostatistics arrangement, presentation and formation of tables and charts.
				108.1.2	Acquire knowledge about the correlation and regression & application of different methods, analysis of data different parametric and non-parametric tests
				108.1.3	Learn general research methodology and Compute statistical problems using various software's
				108.1.4	Understand the process of designing an experiment including factorial, fractional factorial designs, response



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					surface methodology
108.2	BP802TT	SOCIAL & PREVENTIVE PHARMACY	108.2.1	To understand the concept of Health & Disease, Sociology & Personal Hygiene	
			108.2.2	To evaluate the principles for prevention & control of diseases	
			108.2.3	To discuss the Functioning, objective & outcome of different health care programmes	
			108.2.4	To Understand the community services, rural sanitization, health promotion & education in school	
108.3	BP803TT	PHARMA MARKETING MANAGEMENT	108.3.1	To understand the definition and concept and techniques of pharmaceutical marketing	
			108.3.2	To understand the concept of product decision and to apply the techniques of product promotion	
			108.3.3	To understand the concept of marketing channel; the training and roles/duties of sales representatives	
			108.3.4	To understand the concept of pricing strategy and emerging marketing trends	
			108.4.1	To know about the process of drug discovery and development.	



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108.4	BP804TT	PHARMACEUTICAL REGULATORY SCIENCE	108.4.2	To understand the regulatory approval process and their registration in Indian and international markets.
			108.4.3	To know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
			108.4.4	To understand the various regulatory concepts.
108.9	BP809TP	COSMETIC SCIENCE	108.9.1	To know and explain about cosmetics, and related sciences, cosmeceuticals (cosmetics with skin, hair and oral care benefits) and personal care and hygiene products.
			108.9.2	To demonstrate practical skills in the area of biology, formulation science and analytical techniques required to scientifically design and develop various cosmetic products.
			108.9.3	BIS specification and analytical methods for shampoo, toothpaste
			108.9.4	To describe about basic cosmetic problems associated with skin, hair and oral care etc.



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Course Outcome (Pharm.D)

YEAR I

Year	Code	SUBJECT	COURSE OUTCOME		
I	101.1	HAP [818801]	101.1.1	Describe the structure (gross and histology) and functions of various organs of the human body; the various homeostatic mechanisms and their imbalances of various systems;	
			101.1.2	Identify the various tissues and organs of the different systems of the human body; Appreciate coordinated working pattern of different organs of each system; and appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body	
			101.1.3	Perform the haematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes;.	
	101.2	Ph.Ceutics [818802]	101.2.1	Know the formulation aspects of different dosage forms;	
			101.2.2	Do different pharmaceutical calculation involved in formulation	
			101.2.3	Formulate different types of dosage forms and Appreciate the importance of good formulation for effectiveness	
			Bio.chem [818803]	101.3.1	Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases; and Know the metabolic process of biomolecules in health and illness (metabolic



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	101.3			disorders)
			101.3.2	Understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism;
			101.3.3	Know the biochemical principles of organ function tests of kidney, liver and endocrine gland; and e. do the qualitative analysis and determination of biomolecules in the body fluids.
101.4	Ogr.chem [818804]	101.4.1	IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds; Some important physical properties of organic compounds;	
		101.4.2	Free radical/ nucleophilic [alkyl/ acyl/ aryl] /electrophilic substitution, free radical/ nucleophilic / electrophilic addition, elimination, oxidation and reduction reactions with mechanism, orientation of the reaction, order of reactivity, stability of compounds;	
		101.4.3	Some named organic reactions with mechanisms and Methods of preparation, test for purity, principle involved in the assay, important medicinal uses of some important organic compounds	
101.5	Ph.inorganicchem	101.5.1	Understand the principles and procedures of analysis of drugs.	
		101.5.2	Know the analysis of the inorganic pharmaceuticals their applications	



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		[818805]	101.5.3	<p>Application of inorganic pharmaceuticals and Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.</p>
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YEAR II

Year	CODE	SUBJECT	COURSE OUTCOME	
II	102.1	Pathology [828802]	102.1.1	Describe the cellular- adaptations, inflammation and immunity n immune related disease.
			102.1.2	Describe various aspects of cancer, shock and its management, environmental n nutritional diseases. Describe the pathophysiology of selected CNS, CVSdisease.
			102.1.3	Describe the pathophysiology of selectedmetabolic, GIT, renal and respiratory disease. Describe the signs, symptoms, mode of spread, treatment of infective diseases
	102.2	PHARMACEUTI CAL MICROBIOLOG	102.2.1	Know the anatomy, identification, growth factors and sterilization of microorganisms. AnKnow the mode of transmission of disease causing microorganism, symptoms of disease,



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		Y [828802]		and treatment aspect d
			102.2.2	.Do estimation of RNA and DNA and there by identifying the source; do cultivation and identification of the microorganisms in the laboratory.
			102.2.3	Do identification of diseases by performing the diagnostic tests; and appreciate the behavior of motility and behavioral characteristics of microorganisms
	102.3	PHARMACOGNOSY AND PHYTOPHARMACEUTICALS [828803]	102.3.1	To Understand the History & scope of pharmacognosy and to know the classification, cultivation factors, collection, processing and storage of crude drugs
			102.3.2	To understand the Biological source, active constituents and uses of crude drugs and to know about cell inclusions and cell wall constituents.To Understand the different methods of adulteration of crude drugs and to understand the use of plant fibers in surgical dressings And
			102.3.3	To get the knowledge about applications of primary metabolites and natural pesticides of the plant
	102.4	PHARMACOLOGY – I [828804]	102.4.1	Understand the general pharmacological aspects of drugs. And pharmacology of drugs acting on ANS and CVS



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			102.4.2	Understand the pharmacological aspects of drugs falling under CNS
			102.4.3	.Understand the pharmacological aspects of drugs falling under respiratory, hormone and autocooids
	102.5	COMMUNITY PHARMACY [828805]	102.5.1	Know pharmaceutical care services, know the business and professional practice management skills in community pharmacies
			102.5.2	Do patient counselling & provide health screening services to public in community pharmacy
			102.5.3	Respond to minor ailments and provide appropriate medication and Show empathy and sympathy to patients; and, appreciate the concept of Rational drug therapy
	102.6	PHARMACOTHERAPEUTICS – [I828806]	102.6.1	The pathophysiology of selected disease states and the rationale for drug therapy; the therapeutic approach to management of these diseases; the controversies in drug therapy; the importance of preparation of individualised therapeutic plans based on diagnosis
			102.6.2	Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy and Describe the pathophysiology of selected disease states and explain the



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				rationale for drug therapy; summarise the therapeutic approach to management of these diseases
			102.6.3	Discuss the preparation of individualised therapeutic plans based on diagnosis; and identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

YEAR III

Year	NBA CODE	SUBJECT	COURSE OUTCOME	
III	103.1	PHARMACOLOGY – II [838801]	103.1.1	Understand the pharmacological aspects of drugs falling under the category of blood and blood forming agents, renal system, chemotherapy
			103.1.2	Understand the pharmacological aspects of drugs falling under the chemotherapy, immunosuppressant and stimulants and
			103.1.3	Carryout animal experiments.
	103.2		103.2.1	Introduction, sources of quality variation, control of quality variation, concept of statistical quality control.



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				Chromatography instrumentation and applications in pharmacy.
		PHARMACEUTICAL ANALYSIS [838802]	103.2.2	Validation methods- quality of equipment, validation of equipment and validation of analytical instruments and calibration. Spectroscopy instrumentation and applications in analysis.
			103.2.3	GLP, ISO 9000. Total quality management, quality review and documentation. AICH- international conference for harmonization-guidelines. Regulatory control and
			103.2.4	.
103.3		PHARMACOTHERAPEUTICS – II [838803]	103.3.1	Know the pathophysiology of selected disease states and the rationale for drug therapy and to know the therapeutic approach to management of these diseases; and Know the controversies in drug therapy
			103.3.2	Know the importance of preparation of individualised therapeutic plans based on diagnosis
			103.3.3	Appreciate the needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy
			103.4.1	Practice the Professional ethics; and understand the various concepts of the



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103.4	PHARMACEUTICAL JURISPRUDENCE [838804]		pharmaceutical legislation in India Know the various parameters in the Drug and Cosmetic Act and rules; know the Drug policy, DPCO, Patent and design act and
		103.4.2	Understand the labeling requirements and packaging guidelines for drugs and cosmetics; be able to understand the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act
		103.4.3	Other laws as prescribed by the Pharmacy Council of India from time to time including International Laws
103.5	MEDICINAL CHEMISTRY [838805]	103.5.1	Acquire the knowledge about modern concept of rational drug design and Explain MOA and chemical classification and acquire knowledge about relationship between the biological activity and structure of antimicrobial and antiprotozoal
		103.5.2	.Explain MOA and chemical classification and acquire knowledge about relationship between the biological activity and structure of Cardiovascular system
		103.5.3	Explain MOA and chemical classification and acquire knowledge about relationship between the biological activity and structure of



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				endocrine system.
		PHARMACEUTICAL FORMULATIONS [838806]	103.6.1	Understand the principle involved in formulation of various pharmaceutical dosage form and Prepare various pharmaceutical formulation
			103.6.2	Perform evaluation of pharmaceutical dosage forms
	103.6		103.6.3	Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.

YEAR IV

Year	NBA CODE	SUBJECT	COURSE OUTCOME	
IV	104.1	PHARMATHERAPEUTICS - III [848801]	104.1.1	the pathophysiology of selected disease states and the rationale for drug therapy; the therapeutic approach to management of these diseases; the controversies in drug therapy; the importance of preparation of individualised therapeutic plans based on diagnosis
			104.1.2	Needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy



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				(including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects); describe the pathophysiology of selected disease states and explain the rationale for drug therapy;
			104.1.3	To summarize the therapeutic approach to management of these diseases and To discuss the preparation of individualized therapeutic plans based on diagnosis; and identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy
104.2	HOSPITAL PHARMACY		104.2.1	Know various drug distribution methods; know the professional practice management skills in hospital pharmacies;
			104.2.2	Provide unbiased drug information to the doctors; know the manufacturing practices of various formulations in hospital set up.
			104.2.3	Appreciate the practice based research methods and Appreciate the stores management and inventory control
104.3	CLINICAL PHARMACY		104.3.1	Monitor drug therapy of patient through medication chart review and clinical review; obtain medication history interview and counsel the patients; and Identify and resolve drug related problems; detect, assess and monitor



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		[848803]		adverse drug reaction
			104.3.2	Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
			104.3.3	Retrieve, analyse, interpret and formulate drug or medicine information.
	104.4	BIOSTATISTICS AND RESEARCH METHODOLOGY [848804]	104.4.1	To remember and understand the definitions, terminologies, concepts and principles of biostatistics and research methodology. And To understand and apply various Parametric and non parametric statistical test.
			104.4.2	To remember and understand the computer system in hospital pharmacy.
			104.4.3	To remember and understand the computer system in community pharmacy.
	104.5	BIOPHARMACEUTICS AND PHARMACOKINETICS [848805]	104.5.1	Study of absorption, Distribution, Metabolism, and elimination of drug in human body and understand various pharmacokinetic model.understanding of different routes of drug administration of one compartment model And
			104.5.2	Study of Multiple dosage regimen for



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				different compartment model and understanding of non-linear pharmacokinetics.
			104.5.3	Study of non-compartmental pharmacokinetics by understanding statistical movement theory and mean residence time and study of BA & BE.
			104.6.1	To learn basic toxicology relevant for drugs, principles for toxicological testing of new drugs and toxicological follow-up of drugs already in the market
			104.6.2	Understand the toxic drugs and chemicals, poisoning symptoms, treatments and antidotes
	104.6	CLINICAL TOXICOLOGY [848806]	104.6.3	To learn Toxicity of substance of abuse

YEAR V

Year	NBA CODE	SUBJECT	COURSE OUTCOME
V	105.1	CLINICAL	Know the concept of new drug development process. Various approaches of drug discovery. A Understand the regulatory and ethical requirements. Methods of Post-Marketing surveillance and abbreviated



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		RESEARCH [858801]		new drug application process Understand the Good Clinical Practice .
			105.1.2	Understand the clinical trials in accordance to regulatory and ethical requirements.
			105.1.3	Coordinate the clinical trials and promote quality drug trial research. to design clinical study documents (Protocol, CRF, ICF, PIC with assignments). Data Management during and after study and its components Safety monitoring in clinical trials.
	105.2	PHARMACOEPI DEMOLOGY AND PHARMACOECONOMICS [858802]	105.2.1	Understand drugs use pattern and their outcome measures. Understand the defined daily dose and prescribed daily dose Medication adherence measurement. And Understand and apply pharmaco-epidemiological studies
			105.2.2	Adopt the tools effectively in evaluating risk and benefit of therapy
			105.2.3	Understand and apply pharmaco-economic studies and evaluate the cost-benefit ratio. application of different software that use in different studies.
			105.3.1	Design the drug therapy regimen for individual patient. Interpret and correlate the plasma drug concentration



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	105.3	CLINICAL PHARMACOKIN ETICS AND PHARMACOTH ERAPEUTIC DRUG MONITORING [858803]		with patient's thera- peutic outcome And
			105.3.2	Recommend dosage adjustment for patients with renal/ hepatic impairment
			105.3.3	Detect and manage drug –drug interactions. Understand Pharmacogenetics and its scope Genetic Polymorphism in drug metabolism& transport, target Pharmacokinetics and pharmacogenetics considerations



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Course Outcome (M.Pharm, Pharmaceutics)

Semester 1

Semester	Subject Code	Subject	Course Outcome	
I	MAT101T		101.1	To Apply Theory and Practical concepts of UV Spectroscopy, IR Spectroscopy, Spectrofluorimetry and Flame emission Spectroscopy
			101.2	To Understand Fundamental Concept of Nuclear magnetic resonance spectroscopy and Mass Spectroscopy
			101.3	To Apply Theory and Practical concepts of different Adsorption and Partition Chromatography.
			101.4	To Understand Fundamental Concept of Electrophoresis and Immunological Assay
	MPH102T		102.1	To Understand and Remember the various approaches for development of novel drug delivery system
			102.2	To Study and Understand various criteria for selection of drug and polymers for the development of delivering system
			102.3	To Understand and Evaluate various barriers, limitation useful in designing any new system
			102.4	To Study and Understand formulation and evaluation of Novel Drug Delivery system
	MPH103T		103.1	The elements of preformulation studies&The Active Pharmaceutical Ingredients and Generic drug Product development
			103.2	Industrial Management and GMP Considerations



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			103.3	Optimization Techniques & Pilot Plant Scale Up Techniques
			103.4	Stability Testing, sterilization process & packaging of dosage forms
	MPH104T		104.1	Understand and describe various regulatory guidelines like DMF, IND, NDA, ANDA, USFDA
			104.2	Understand and describe various regulatory guidelines like CTD, CMC, ICH, MHRA, TGA and EU
			104.3	Non clinical drug development IND, NDA, ANDA, IMPD
			104.4	Clinical trials: Developing clinical trial protocols
	MPH105P		105.1	To understand the various spectroscopic techniques
			105.2	To perform the estimation of drug by Fluorimetry and Photometry
			105.3	To understand the various preformulation studies of different sustained and controlled release dosage form
			105.4	To Perform the various sustained and controlled release formulation and Evaluations
II	MPH201T		201.1	To Understand various approach for development of novel drug delivery systems
			201.2	To understand criteria for the selection of drug for the development of NTDS
			201.3	To understand criteria for the selection of polymers for the development of NTDS
			201.4	To Understand formulation and evaluation of Novel drug delivery system
	MPH202T		202.1	To understand of basic knowledge of



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				biopharmaceutics & Pharmacokinetics.
			202.2	To understand the use raw data and derive the pharmacokinetic models and parameters & The use raw data and derive the pharmacokinetic models and parameters
			202.3	To understand the design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
			202.4	To remember the design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
	MPH203T		203.1	To remember The design and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
			203.2	To Understand Computational Modeling of Drug Disposition, Computers in Preclinical Development & Optimization Techniques in Pharmaceutical Formulation
			203.3	To Understand Computers in Market Analysis & Computers in Clinical Development
			204.4	To Understand Artificial Intelligence(AI) and Robotics & Computational fluidynamics (CFD)
	MPH204T		204.1	Key ingredients used in cosmetics and cosmeceuticals & Key building blocks for various formulations.
			204.2	Current technologies in the market
			204.3	Various key ingredients and basic science to develop cosmetics and cosmeceuticals
			204.4	Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and



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				efficacy
	MPH205P		205.1	To understand the theoretical knowledge of various dosage forms like microcapsules, beads, microspheres, liposomes, niosomes, sherules
			205.2	To understand the pharmacokinetics and IVIVC data analysis by using different software
			205.3	To understand the different design software for optimization of final batch
			205.4	To understand the different Pharmacokinetics model
III	MRM301T		301.1	Learn general research methodology and understand the basic steps in experimental design.
			301.2	Understand the basic concepts of biostatistics also learn different parametric and non-parametric tests
			301.3	Understand the functions of ethics committees in medical research, experimentation on animals, genesis of bioethics with special reference to Helsinki declaration, guidelines for developing animal facilities and explain the guidelines and importance of medical research
			301.4	Understand the various mechanisms to protect IPR



SHREE DHANVANTARY PHARMACY COLLEGE

Course Outcome (M.Pharm, Pharmaceutical Chemistry)

Semester 1

Subject Code	CO	Statement
MPC101T	101.1	To Apply Theory and Practical concepts of UV Spectroscopy, IR Spectroscopy, Spectrofluorimetry and Flame emission Spectroscopy
	101.2	To Understand Fundamental Concept of Nuclear magnetic resonance spectroscopy and Mass Spectroscopy
	101.3	To Apply Theory and Practical concepts of different Adsorption and Partition Chromatography.
	101.4	To Understand Fundamental Concept of Electrophoresis and Immunological Assay
Subject Code	CO	Statement
MPC102T	102.1	Learn and apply the principles and applications of reactive intermediates
	102.2	Understand the mechanism& applications of various named reactions
	102.3	Learn and apply the concept of disconnection to develop synthetic routes for small target molecule
	102.4	Know various catalysts used in organic reactionsand understand the chemistry of heterocyclic compounds
Subject Code	CO	Statement
MPC103T	103.1	Understand the Different stages of drug discovery
	103.2	Study in depth aboutRole of medicinal chemistry in drug research and Different techniques for drug discovery
	103.3	Gain knowledge aboutVarious strategies to design and develop new drug



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		like molecules for biological targets
	103.4	Understand thePeptidomimetics
Subject Code	CO	Statement
MPC104T	104.1	Understand different types of natural compounds and their chemistry and medicinal importance
	104.2	Perform the isolation, purification and characterization of simple chemical constituents from natural source
	104.3	Know the importance of natural compounds as lead molecules for new drug Discovery and general methods of structural elucidation of compounds of natural origin
	104.4	Study the concept of DNA technology tool for new drug discovery
Subject Code	CO	Statement
MPC105P	105.1	Develop analytical instrumental techniques for identification, characterization and quantification of drugs
	105.2	Learn different techniques of organic synthesis, mechanisms, their application
	105.3	Understand and Learn synthetic route for the medicinal important compounds
	105.4	Isolate, elucidate and characterize medicinal compounds from natural origin



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Semester 2

Subject Code	CO	Statement
MPC201T	201.1	Study in depth about various spectroscopic and spectrometry techniques
	201.2	Acquire knowledge about Interpretation of the NMR, Mass and IR spectra of various organic compounds
	201.3	Gain expert theoretical and practical skills of the hyphenated instruments.
	201.4	Gain expert knowledge in identification of organic compounds
Subject Code	CO	Statement
MPC202T	202.1	Study the principles and applications of Green chemistry
	202.2	Learn and apply concept of peptide chemistry.
	202.3	An ability to understand role of various catalysts used inorganic reactions
	202.4	Understand and apply the concept of stereochemistry and asymmetric synthesis
Subject Code	CO	Statement
MPC203T	203.1	Study in depth about Role of CADD in drug discovery and Different CADD techniques and their applications
	203.2	Acquire knowledge about Various strategies to design and develop new drug like molecules
	203.3	Gain knowledge about Working with molecular modeling softwares to design new drug molecules
	203.4	Understand the in silico virtual screening protocols
Subject Code	CO	Statement



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MPC204T	204.1	Develop the strategies of scale up process of APIs and intermediates
	204.2	Apply the various unit operations in process chemistry
	204.3	Explain and apply the various unit process reactions in process chemistry
	204.4	Learn the various industrial safety measures and norms.
Subject Code	CO	Statement
MPC205P	205.1	Learn the method of synthesis using various catalysts
	205.2	Know the synthesis of various APIs / intermediates by adopting various reaction approach
	205.3	Learn various structure-based drug design methods (Denovo drug design, fragment-based drug design)
	205.4	Learn the strategies of scale up process of APIs and intermediates

Semester 3

Subject Code	CO	Statement
MRM301T	301.1	Learn general research methodology and understand the basic steps in experimental design.
	301.2	Understand the basic concepts of biostatistics also learn different parametric and non-parametric tests
	301.3	Understand the functions of ethics committees in medical research, experimentation on animals, genesis of bioethics with special reference to Helsinki declaration, guidelines for developing animal facilities and explain the guidelines and importance of medical research
	301.4	Understand the various mechanisms to protect IPR



SHREE DHANVANTARY PHARMACY COLLEGE

Course Outcome (M.Pharm, Regulatory Affairs)

Semester 1

Subject Code	CO	Statement
MRA101T	101.1	To understand the key regulatory and compliance elements with respect to Good Manufacturing Practices, Good Laboratory Practices, Good Automated Laboratory Practices and Good Documentation Practices
	101.2	To remember, Prepare and implement the check lists and SOPs for various Good Regulatory Practices
	101.3	To understand and apply the Good Regulatory Practices in the Healthcare and related Industries.
	101.4	To understand the methods for the readiness and conduct of audits and inspections.
Subject Code	CO	Statement
MRA102T	102.1	To understand and remember the various documents pertaining to drugs in pharmaceutical industry
	102.2	To understand and remember the basics of regulatory compilation
	102.3	To create and assemble the regulation submission as per the requirements of agencies
	102.4	To understand and remember Follow up protocols of the submissions and post approval document requirements
Subject Code	CO	Statement
MRA103T	103.1	To understand history, origin and ethics of clinical and biomedical research and evaluation
	103.2	To understand and remember the clinical drug, medical device



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		development process and different types and phases of clinical trials
	103.3	To understand and remember regulatory requirements and guidance for conduct of clinical trials and research
	103.4	To apply the knowledge regarding regulatory requirements and guidance for conduct of clinical trials and research
Subject Code	CO	Statement
MRA104T	104.1	To understand and remember the different Acts and guidelines that regulate Drugs & Cosmetics, Medical Devices, Biologicals & Herbals, and Food & Nutraceuticals industry in India
	104.2	To remember and understand the approval process and regulatory requirements for Drugs & Cosmetics, Medical Devices, Biologicals & Herbals, and Food & Nutraceuticals and dossier for Clinical trials
	104.3	To remember and understand guidelines for preclinical and clinical trial, BA BE studies, stability studies and stem cell research.
	104.4	To remember, understand and apply the knowledge regarding filing a patent trademarks and copyrights.
Subject Code	CO	Statement
MRA105T	105.1	To understand the various regulatory documentation process
	105.2	To understand the guidelines for preparation of documents for regulatory studies
	105.3	To understand and apply the check list and format for regulatory documents
	105.4	To understand and apply the knowledge regarding filing a patent trademarks and copyrights.



SHREE DHANVANTARY PHARMACY COLLEGE

Course Outcome (M.Pharm, Quality Assurance)

Semester 1

Subject Code	CO	Statement
MQA101T	101.1	To Apply Theory and Practical concepts of UV Spectroscopy, IR Spectroscopy, Spectrofluorimetry and Flame emission Spectroscopy
	101.2	To Understand Fundamental Concept of Nuclear magnetic resonance spectroscopy and Mass Spectroscopy
	101.3	To Apply Theory and Practical concepts of different Adsorption and Partition Chromatography
	101.4	To Understand Fundamental Concept of Electrophoresis and Immunological Assay
Subject Code	CO	Statement
MQA102T	102.1	To understand and remember the importance of quality
	102.2	To understand and remember the tools for quality improvement
	102.3	To apply the solution for the analysis of issues in quality
	102.4	To understand the stability, statistical approaches for the quality
Subject Code	CO	Statement
MQA103T	103.1	To understand concepts of quality control, quality assurance, gmp, quality management & importance of ich guidelines, cpcsea guidelines
	103.2	To understand CGMP aspects of pharmaceutical industry
	103.3	To evaluate the importance analysis of raw material, ipqc testing
	103.4	To understand the importance of document maintenance in pharma industry
Subject Code	CO	Statement



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MQA104T	104.1	Understand the principal of Drug discovery and development and Pre formulation Studies
	104.2	Understand the Concepts of pilot plat scale up of Solid, Liquid, Semi solid, Parental Dosage Form
	104.3	Understand the Pharmaceutical packing of Container, Closure, Secondary packing material
	104.4	Understand the concept of Technology transfer
Subject Code	CO	Statement
MQA105P	105.1	Develop analytical instrumental techniques for identification, characterization and quantification of drugs
	105.2	Learn different documentation aspects as per requirement of QA department
	105.3	Understand and Learn different formulation development and quality control aspects of same
	105.4	Understand necessary information to new product development for actual manufacturing



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Course Outcome (M.Pharm, Pharmacology)

Subject Code	CO	Statement
MAT101T	101.1	To Apply Theory and Practical concepts of UV Spectroscopy, IR Spectroscopy, Spectrofluorimetry and Flame emission Spectroscopy
	101.2	To Understand Fundamental Concept of Nuclear magnetic resonance spectroscopy and Mass Spectroscopy
	101.3	To Apply Theory and Practical concepts of different Adsorption and Partition Chromatography.
	101.4	To Understand Fundamental Concept of Electrophoresis and Immunological Assay
MPL102T	102.1	Understand the pharmacological actions of different categories of drugs
	102.2	Discuss the pathophysiology and pharmacotherapy of certain diseases
	102.3	Explain the mechanism of drug actions at cellular and molecular level
	102.4	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
MPL103T	103.1	Appraise the regulations and ethical requirement for the usage of experimental animal
	103.2	Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental Animals
	103.3	Describe the various newer screening methods involved in the drug discovery process
	103.4	Appreciate and correlate the preclinical data to humans
MPL10	104.1	Describe the Various Gene organization, Mapping & Sequencing.



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	104.2	Detail Study of different intracellular signaling pathways & Appreciate to understand Detailing of Receptors.
	104.3	Better Understanding the Principles and Applications of Genomics & Proteomic Tools.
	104.4	Describe the Gene Mapping with Different Cloning Disease Gene It's role in Health/Pharmacology. Using Some Basic Cell Culture Lab Equipment's.
MPL105P	105.1	Understand the ethics for preclinical studies and to demonstrate various basic techniques of animal handling and experimental procedures.
	105.2	To Understand and Perform (in-vitro) isolation studies.
	105.3	Understand and to demonstrate various(in-vivo) experimental procedure to explore pharmacology of various class of drugs.
	105.4	Understand Pharmacokinetic Study Of Varioud Drugs