

List of courses offered during Academic year 2020-21

Sr. No	Class	Semester	Curriculum Pattern by SPPU	Course Code	Name of course	Name of staff	Course Outcomes
1	FY B. Pharmacy	First	2018 Pattern	BP 101T	Human Anatomy & Physiology I	S.R. Thanage	<ul style="list-style-type: none"> CO1: Explain terminologies and its significance involved in human anatomy and physiology & illustrate the gross morphology, structure and functions of various levels of organization of human body. CO2: classify the various homeostatic mechanisms and their imbalances. CO3: justify and list the various principles of cell communication at cellular level study with their different forms of signaling. CO4: classify the different types of tissue, bones, and muscles, nerves with their structure, location, and function. CO5: Describe special sense organs, digestive and circulatory with illustration of their structure and function.
				BP102T	Pharmaceutical Analysis-I	M.S.Bhosle	CO1: To understand the concept of pharmaceutical analysis CO2: To illustrate and examine acid base, non aqueous titration CO3: To discuss and examine precipitation, complexometric titration and gravimetric CO4: To understand and examine redox titration CO5: To illustrate and examine conductometry, potentiometry and polarography method
				BP103T	Pharmaceutics I – Th	S. S. Siddheshwar	CO1: To illustrate the history and development of pharmacy profession and different pharmacopoeias. CO2: To explain, compare, contrast and classify various routes of drug administration and to Discuss concept of dosage forms. CO3: To Illustrate the professional way of handling the prescription and Counsel patient. CO4: To solve the pharmaceutical calculations and factors which influence the design of pharmaceutical dosage forms and administrations.



Principal

Principal
 Pimpri Chinchwad Education Trust College of Pharmacy
 Pimpri Chinchwad, Maharashtra-411 306

				BP104T	Pharmaceutical Inorganic Chemistry	.K.V Dhamak	<p>CO1: .To analyze the sources of impurities and methods to determine the impurities in inorganic drugs and Pharmaceuticals Inorganic substances.</p> <p>CO2: To understand the medicinal and pharmaceutical importance of inorganic compounds and practical skills of inorganic compounds .</p> <p>CO3: To understand in detail the Physico-chemical properties and pharmacological properties of pharmaceuticals inorganic compounds and its uses.</p> <p>CO4: To identify the Inorganic Compounds by Qualitative Analysis</p>
				BP105T	Communication Skills	D.N Vikhe	<p>CO1: To illustrate the communication process and importance of communication.</p> <p>CO 2: To communicate effectively (Verbal and Non Verbal).</p> <p>CO 3: Acquire the knowledge of listening skill and application.</p> <p>CO 4: To develop interview skills.</p> <p>CO5: To develop leadership qualities and essentials</p>
				BP 106BT	Remedial Biology	T.P.Dukre	<p>CO1:- To understand Basic Nature of Plant cell and Animal cell)</p> <p>CO2:- To illustrate Classification System of both Plants & Animals</p> <p>CO3:- To learn Various tissue system and organ system in plant and animals</p> <p>CO4:- To understand Theory of evolution</p> <p>CO5:- To illustrate Anatomy and Physiology of plants and animals</p>
				BP 106RMT	Remedial Mathematics	T.P.Dukre	<p>CO1:- To apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.</p> <p>CO2:- To illustrate mathematical representations and mathematical relationships</p> <p>CO3:- To communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy</p> <p>CO4:- To learn Perform abstract mathematical reasoning</p>

				BP107 P	Human Anatomy & Physiology I Practical	S.R. Thanage	CO1: To Illustrate different parts of microscope and determine RBC Count, WBC count, Hb content, blood group. CO2: To Study histology of important tissues, cardiovascular system and human digestive system. CO3: To determine clotting time, bleeding time, blood pressure
--	--	--	--	---------	--	--------------	---

							, body temperature, pulse rate. CO4: To determine ECG & explain its significance CO5: To observe hospital structure and working of blood bank
				BP108 P	Pharmaceutical Analysis-I	M.S.Bhosle	CO1: To compose and assess the chemical compound's CO2: To assess and identify the chemical compound by standardization of titrant CO3: To examine and assess the normality of compound's by electro-analytical methods
				BP109P	Pharmaceutics I – Pr	S. S. Siddheshwar	CO1: To examine and design the various dosage forms. CO2: To compare and contrast and design various dosage forms
				BP110P	Pharmaceutical Inorganic Chemistry	K.V.Dhamak	CO1: To Access the limit tests for the compounds . CO2: To design the different methods for identification of inorganic compounds. CO3. To explain the tests for purity for the compounds . CO4. To synthesize the Inorganic Pharmaceuticals by appropriate methods.
				BP111 P	Communication Skills	P.S.Rao.	CO1: Explain basic Communication Skills CO2: To Illustrate Various Pronunciation Skills. CO3: To Access Direct / Indirect & Effective Communications Skills CO4: To Describe Effective Writing Skills & Presentation
				BP112RBP	Remedial Biology	T.P.Dukre	CO1: To understand Microscopic study and identification of tissues. CO2: To learn Microscopic study and identification of tissues CO3: To examine bone parts and blood components in body

2.	Second Year B. Pharmacy	Th	2015 Pattern	2.3.1 T	Physical Pharmaceutics- I	R.J.Bhor	<p>CO1: To explain the process of solubility of different drug/excipients, diffusion and dissolution and distribution phenomena for application in the design of dosage form.</p> <p>CO2: To use the physicochemical properties of the state of matter and their importance in the development and evaluation of pharmaceutical dosage forms.</p> <p>CO3: To understand basic principles and properties of liquid interfaces and surface and interfacial phenomenon.</p> <p>CO4: To understand basic knowledge of pH, buffers, isotonicity, protein binding and complexation in pharmaceutical as well as in biological system.</p>
				2.3.1 P	Physical Pharmaceutics- I	R.J.Bhor	<p>CO1: To study solubility and distribution of solute in solvent under different experimental conditions</p> <p>CO2: To study factors affecting miscibility in two and three component systems</p> <p>CO3: to determine physical parameters of the solute solvent mixture in experimental set up</p>
				2.3.2 T	Pharmaceutical Microbiology	SD Mankar	<p>CO1:To explain methods of cultivation and preservation of various microorganisms.</p> <p>CO2.To identify the importance and implementation of sterilization in pharmaceutical processing and industry</p> <p>CO3.To explain need of sterility testing, to learn basic principles & Procedure of sterility testing of pharmaceutical products.</p> <p>CO4.To plan out microbiological standardization of Pharmaceuticals including presence and absence of micro-organism as well as counting of total number of micro-organism</p> <p>CO5.To explain the cell culture technology and its applications in pharmaceutical industries.</p>

			2.3.2 P	Pharmaceutical Microbiology	SD Mankar	CO1: To study different method of preparation & sterilization of media for isolation & identification of micro-organism CO2: To study identification of different micro-organism by using different staining techniques.
			2.3.3 T	Pharmaceutical	R K Godge	CO1: To analyze basics like chemistry, function, classification,

					Biochemistry		biological importance, qualitative tests & applications of various biomolecules. e.g. proteins, carbohydrates and lipids, etc CO2: To understand concept of free energy, endergonic and exergonic reaction CO3: To describe general metabolism process of carbohydrates. CO4: To illustrate biological oxidation process with respect to electron transport chain and oxidative phosphorylation.
				2.3.3 P	Pharmaceutical Biochemistry	R K Godge	CO1: To identify carbohydrates, proteins by qualitative test. CO2: To investigate abnormal constituent present in urine by qualitative test. CO3: To analyze creatinine blood sugar, serum total cholesterol present in blood. CO4: To illustrate enzymatic hydrolysis of starch by using temperature, time and pH.
				2.3.4 T	Pharmaceutical Organic Chemistry-III	S.D Magar.	CO1: To understand molecular representation, interconversion, significance and basic concepts of stereochemistry conformational analysis of molecules CO2: To learn various rearrangement reactions, pericyclic reactions and its mechanism with application CO3: To understand chemistry of amino acids and carbohydrates and its underlying concepts with synthesis and reaction methods.
				2.3.4 P	Pharmaceutical Organic Chemistry-III	S.D Magar.	CO1: To synthesize the organic compounds by appropriate method. CO2: To describe different methods for separation of column and thin layer chromatography. CO3: To design different methods for qualitative analysis of binary mixtures. CO4: To design different organic compounds by stereo models.



Principal

Principal
Puneet Rani College of Pharmacy
Pharwanagar, A-13 T-10

			2.3.5 T	Pharmacology-I	S.R. Thanage	<p>CO 1: To Describe the basic pharmacology along with its scope. The nature and sources of drugs and route of drug administration.</p> <p>CO 2: To Know the process of drug discovery and development.</p> <p>CO 3: To Understand pharmacokinetic and pharmacodynamics of drugs.</p> <p>CO 4: To Understand receptor, drug receptor interaction, drug toxicity, drug interaction and adverse drug reactions.</p> <p>CO 5: To correlate the Rational drug treatment in pediatric and</p>
--	--	--	---------	----------------	--------------	---

						geriatric patients and in pregnancy
				2.3.6T	Pharmacognosy & Phytochemistry - I	D.N.Vikhe CO 1: Predict the meaning & significance of Pharmacognostic parameters & Pharmacognostic study of crude drugs. CO 2: To compare and contrast primary metabolites . CO 3: To categorize and analyze glycosides & tannin compounds of plant origin.
				2.3.6P	Pharmacognosy & Phytochemistry - I	D.N.Vikhe CO 1: To describe the morphology and microscopy of crude drugs CO 2: To identify crude drugs based upon the powder characteristics CO 3: To perform the qualitative analysis of unorganised crude drugs CO 4: To determine swelling index CO 5: To determine physical constants CO 6: To extract phytoconstituents CO 7: To estimate tannins
3.	Third Year B. Pharmacy	Fifth	201	BP 502 T	Formulative Pharmacy	M H Kolhe CO1: Summarize the concepts of solid dosage form design & formulation strategies. CO2: Explain tablets as a dosage form, physico-chemical principles guiding tablet formulation, various tablet additives, manufacture & evaluation equipments, defects in tableting & remedies. CO3: Tell the concept, types, pharmacopoeial specifications, techniques & equipments used in tablet coating. CO4: Explain the concept of technology transfer.
				BP 506 P	Formulative Pharmacy	SD Mankar CO1: Formulate , evaluate and label the prepared tablets CO2: Formulate evaluate and label the prepared capsules CO3: Associate , rational behind use of formulation ingredients.

			BP 501 T	Medicinal Chemistry –II	A S Dighe	<p>CO1: To Explain principles and concepts in medicinal chemistry such as biological membrane, physicochemical properties affecting drug action, stereo chemical aspects of drug action, Bioisosterism, Drug absorption, distribution, metabolism, elimination and toxicity, Protein binding, Blood brain barrier etc.</p> <p>CO2: To Explain different Types of receptors, forces involved in drug receptor interaction; mediators of biological response, signal transduction.</p> <p>CO3. 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 recent developments in the Adrenergic agents.</p> <p>CO4. To illustrate Biosynthesis, release and metabolism of Acetylcholine, Cholinergic receptor subtypes, design of the drugs, history, classification, nomenclature, SAR, mechanism of action, therapeutic uses, adverse effects, synthesis of drugs and recent developments in the Cholinergic agents</p> <p>CO5. To Explain design of the drugs, history, classification, nomenclature, SAR, mechanism of action, therapeutic uses, adverse effects, synthesis of drugs and recent developments in the cardiovascular Agents</p>
			BP 503 T	Pharmacology-II	S. B. Dighe	<p>CO1: To discuss classification, mechanism of action, pharmacological actions, pharmacokinetics, therapeutic uses, adverse effects, drug interactions, contraindications, dosages, treatment of poisoning Pharmacotherapy shall include: Pharmacology of drug/s used for clinical management of</p>



Principal

Principal
Nursing College of Pharmacy
Pune, Maharashtra-411 004

						<p>diseases/ disorder</p> <p>CO2:To categorize Sympathetic and Parasympathetic Nervous system with neurotransmitters and their receptors with Signal Transduction mechanisms</p> <p>CO 3:To describe the functioning of different endocrine glands and actions of different hormones on body organs for maintenance of homoeostasis</p> <p>CO 4: To discuss disorders caused due to hyper or hyposecretion of hormones and drugs used for treatment of such disorders</p>
				BP 507 P	Pharmacology-II Practical	Dr. S. B. Dighe <p>CO 1: To describe commonly used instruments in experimental pharmacology.</p> <p>CO 2: To discuss Care and handling of common laboratory animals, animal welfare and introduction of CPCSEA and its guidelines, OECD guidelines.</p> <p>CO 3: To explain animal physiology with their biochemical reference values in various animal species.</p> <p>CO 4: To examine various routes of drug administration and various anesthetics employed to anesthetize laboratory animals. various methods for collection of blood, body fluids and urine from experimental animals.</p> <p>CO 5: To list physiological salt solutions, drug solution and use of molar solution in various animal experiments.</p>
				BP 504 T	Pharmacognosy and Phytochemistry II	D N Vikhe <p>CO 1: To explain modern extraction technique and isolation of phytoconstituent..</p> <p>CO 2:To understand Metabolic Pathway of Secondary Metabolite</p> <p>CO 4:To understand formulation of herbal formulation .</p> <p>CO 5: To explain isolation of Phytoconstituent.</p>
				BP 508 P	Pharmacognosy and Phytochemistry II	D N Vikhe <p>CO 1: To Study Morphology,histology and powder characteristics of crude drug.</p> <p>CO 2: To Study TLC of herbal extract.</p> <p>CO 3: To Study Volatile oil distillation and determination by Thin layer chromatography.</p>

				BP 505 T	Pharmaceutical Jurisprudence	S S Siddheshwar	<p>CO1:To explain Basic principles, purpose and dimensions of the laws.</p> <p>CO2:.To discuss important rules and regulations and procedures made to execute the laws and to explain the definitions in the Act.</p> <p>CO3:.To Identify potential fraud and abuse legal issues of narcotic & psychotropic substance.</p> <p>CO4:.To explain about Patents, procedure for patent application and IPR and to prioritize the regulatory system for safety and</p>
--	--	--	--	-----------------	------------------------------	-----------------	--

4.	Final Year B. Pharmacy	Seventh	2015 Pattern	4.7.1 T	Sterile Products	MH Kolhe	<p>CO1:To understand the General requirements, routes of administration, significance of tonicity adjustment and sterility and Pre-formulation of sterile products.</p> <p>CO2:To understand various packaging materials used, types, choice of containers, official quality control tests and methods of evaluation.</p> <p>CO3:To learn the concepts of the GMP and design and layout of Parenteral Production Facility, environmental control zones, heating ventilation air conditioning (HVAC), HEPA filter and laminar area flow systems.</p> <p>CO4:To learn Classification and formulation of SVP and LVPs, their types and selection of vehicles and added substance, processing, manufacturing and Quality control of SVPs and LVPs along with Special types of SVPs and LVPs and Pilot plant scale up.</p> <p>CO5:To understand concept of Ophthalmic, Blood, Surgical and Lypophilized products</p>
				4.7.1 P	Sterile Products	MH Kolhe	<p>CO1: To inspect the validation of aseptic area.</p> <p>CO2:To compare and contrast and design various SVPs & LVPs</p> <p>CO3:To compare and contrast and design various ophthalmic products.</p> <p>CO4:To compare and contrast and design various packaging material.</p> <p>CO5:To compare and contrast and design various dosage form.</p>
				4.7.2 T	Pharmaceutical Analysis V	G S Shinde	<p>CO1: To explain principle, instrumentation, application and examine APIs using Gas chromatography</p> <p>CO2: To explain theoretical, Practical parameters of Infrared (FTIR) spectroscopy and assess organic compound using FTIR spectra.</p> <p>CO3: To discuss principle, instrumentation and use of Raman Spectroscopy.</p> <p>CO4: To Explain principle ,instrumentation ,application of HPLC and compare HPLC with UPLC</p> <p>CO5: To explain and compare principle, instrumentation and application of SEM and TEM</p>

				4.7.2 P	Pharmaceutical Analysis V	G S Shinde	<p>CO1: To examine and identify API and its formulation by simultaneous equation method</p> <p>CO2: To examine and identify API and its formulation by Absorbance ratio method.</p> <p>CO3: To discuss process to record IR spectra of compounds containing different functional group.</p> <p>CO4: To illustrate process ,interpret the data obtained through experimentation and assess the results as per regulatory requirements</p>
				4.7.3.T	Medicinal Chemistry -III	N S Dighe	<p>CO1: To Know design & development of drugs including history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses, synthesis and recent developments in β-lactam antibiotics</p> <p>CO2: To Explain design & development of drugs including history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses, synthesis and recent developments in aminoglycosides and macrolides.</p> <p>CO3: To understand design & development of drugs including history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses, synthesis and recent developments in tetracycline, Lincomycins, Polypeptides, Unclassified antibiotics</p> <p>CO4: To Know design & development of drugs including history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses, synthesis and recent developments in antineoplastic agents including recent drugs and monoclonal antibodies</p> <p>CO5: To Understand design & development of drugs including history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, adverse effects, therapeutic uses, synthesis and recent developments in synthetic antibacterial agents, trypanosomicidal and antileishmaniasis drugs</p>

				4.7.3.P	Medicinal Chemistry -III	N S Dighe	<p>CO1: To synthesize the medicinally important compounds by appropriate method and monitoring reaction with TLC.</p> <p>CO2: To find synthesized compound by column chromatography</p> <p>CO3: To access and interpret spectra of synthesized compound by IR</p> <p>CO4: To access and interpret standard spectra of organic compound by ¹H-NMR</p> <p>CO5: To explain and demonstrate principle and working of Gas Chromatography, Atomic Absorption Spectrophotometry & SEM</p>
				4.7.4 T	Pharmacology-IV	S. B. Bhawar	<ul style="list-style-type: none"> • CO 1: To understand the Chemotherapy including Drug resistance • CO 2: To describe mechanism of drugs used in Cardio-vascular system diseases • CO 3: To Composition of physiological salt solutions and basic instruments used in experimental pharmacology. • CO 4: To Performance of isolated experiments using various isolated preparation and the effects of different drugs on the concentration response curves. • CO 5: To Study the action of various drugs using preclinical models/ computer simulations.
				4.7.4 P	Pharmacology-IV Practical	S. B. Bhawar	<p>CO 1: To understand the Critical appraisal of fixed dose drug combinations of marketed preparations</p> <p>CO 2: To describe Comment on given prescriptions with reference to case reports mentioning possible indications and contraindications with dose, route of administration and justification of each ingredient.</p> <p>CO 3: To carry out the statistical analysis of given experimental data using appropriate method(s) based on parametric or non-parametric methods</p> <p>CO 4: To performance of isolated experiments using various isolated preparation and the effects of different drugs on the concentration response curves.</p> <p>CO 5: To study the action of various drugs using preclinical models/ computer simulations.</p>



Principal

Pimpri Chinchwad Education Trust
Pimpri Chinchwad College of Pharmacy
Pimpri Chinchwad, Maharashtra-411 004

			4.7.5 T	Natural Drug Technology	.D.N.Vikhe	<p>CO1: To discuss methods of cultivation .harvesting and storage of crude drugs and outline good agricultural and collection practises..</p> <p>CO2: To explain application of plant tissue culture in production of secondary metabolites.</p> <p>CO3: To investigate different in vitro screening methods of natural product.</p> <p>CO4: To use the concept of health diagnosis & treatment aspects of Ayurveda, Unani, Siddha & Homeopathic system of medicine .</p> <p>CO5: To predict potential of novel drug delivery system for herbals</p>
			4.7.5 P	Natural Drug Technology	.D.N.Vikhe	<p>CO1: To design and assess ayurvedic formulations.</p> <p>CO2: To design and assess herbal formulations,skin care cosmetic and hair care cosmetic.</p> <p>CO3: To examine and inspect prepared and marketed skin and hair care cosmetic.</p> <p>CO4: To investigate spectral data of isolated compounds.</p> <p>CO5: To predict free radical scavenging activity by UV.</p> <p>CO6: To predict anti-inflammatory activity of herbal drugs by in- vitro method</p>
			4.7.6 T	Bio-pharmaceutics & Pharmacokinetics	RB Laware	<p>CO 1 : To describe the concept of biopharmaceutics and its applications in formulation development.</p> <p>CO 2: To explain and apply knowledge of pharmacokinetic processes designing pharmaceutical dosage form.</p> <p>CO 3: To discuss the concepts of bioavailability and bioequivalence studies.</p> <p>CO 4: To explain various compartmental models and non-compartmental analysis methods.</p> <p>CO 5: To explain and apply concept and mechanisms of dissolution and in vitro in vivo correlation</p>

			4.7.7 T	Pharmaceutical Jurisprudence	S S Siddheshwar	<p>CO1:To explain Basic principles, purpose and dimensions of the laws.</p> <p>CO2:.To discuss important rules and regulations and procedures made to execute the laws and to explain the definitions in the Act.</p> <p>CO3:.To Identify potential fraud and abuse legal issues of narcotic & psychotropic substance.</p> <p>CO4:.To explain about Patents, procedure for patent application and IPR and to prioritize the regulatory system for safety and</p>
--	--	--	---------	------------------------------	-----------------	--

							effectiveness of medicine and quality of product.
5	F i r s	S e c o	20 18 Pa	BP201T	Human Anatomy & Physiology II	S,B.Dighe	<p>CO1: Describe significance of the different mechanisms that govern the normal working of various organs and systems as a whole.</p> <p>CO2: 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.</p> <p>CO3: Name and describe various sense organs involved in our body to maintain homeostasis.</p> <p>CO4: Discuss basic organs and mechanism involved in respiration along with clinical significance and disorders of respiratory system.</p> <p>CO5: 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.</p>
				BP202T	Pharmaceutical Organic Chemistry I	K V Dhamak	<p>CO1: To Illustrate the structure, name and the type of isomerism of the organic compound.</p> <p>CO2: To Learn the reaction, name the reaction and orientation of reactions .</p> <p>CO3: To Discuss in detail the reactivity/stability of compound.</p> <p>CO4. To Identify/confirm the identification of organic compounds</p>

			BP203 T	Biochemistry	M S Bhosale	<p>CO1:To Understand the significance, concepts of Cell and applications of biochemistry.</p> <p>CO2: To Describe the chemistry, biological functions of Carbohydrates, Lipids, Proteins, Vitamins and Amino acids.</p> <p>CO3: To Apply the mechanism of enzyme action and identify the classes of enzymes and factors affecting action, mechanism of electron transport chain</p>
--	--	--	---------	--------------	-------------	--

							CO4. To Explain the synthesis of nucleic acids, their role in metabolic pathways transcriptional, translational, and post-translational levels, Hereditary Diseases. CO5. To Discuss the metabolic pathways of Carbohydrates, Lipids, Proteins and Amino Acids
				BP204 T	Pathophysiology	S.B.Dighe	CO1: To describe the etiology and pathogenesis of the selected disease states CO2: .To knowledge of signs and symptoms of the diseases CO3: To identify the complications of the diseases. CO4: 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	S B Bhawar	CO1: To Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement CO2: To Design and develop solutions to analyze pharmaceutical problems using computers. CO3: To Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities CO4: To Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy .
				BP206 T	Environmental sciences	K V Dhamak	CO1: To create awareness about environmental problems CO2: To impart basic knowledge about the environments and its allied problems CO3: To develop and attitude of concern for the environment. CO4: To strive to attain harmony with nature
				BP207 P	Human Anatomy & Physiology II Practical	R.D.Ghogare	CO1: To Illustrate different parts of microscope and determine RBC Count, WBC count, Hb content, blood group. CO2: To Study histology of important tissues, cardiovascular system and human digestive system. CO3: To determine clotting time, bleeding time, blood pressure, body temperature, and pulse rate. CO4: To determine ECG & explain its significance CO5: To observe hospital structure and working of blood bank

			BP208P	Pharmaceutical Organic Chemistry	K V Dhamak	CO1: To identify and access the unknown organic compound by qualitative analysis.
--	--	--	--------	-------------------------------------	------------	--

					I		CO2: To synthesize solid derivatives from organic compounds. CO3: To construct the molecular models.
				BP209 P	Biochemistry	M S Bhosale	CO1: To illustrate the concept of enzyme hydrolysis and examine the role of enzyme in day to day life. CO2: To understand the various qualitative tests for identification of biomolecules CO3: To identify the pH and blood constitute like blood sugar, blood creatinine and total serum cholesterol. CO4. To examine the reducing sugar by DNS method, proteins by Biuret method and urine abnormalities.
				BP210 P	Computer Application in Pharmacy	S.B.Bhawar	CO1: To Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement CO2: To Design and develop solutions to analyze pharmaceutical problems using computers. CO3: To Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities CO4: To Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy .

6	Second Year B. Pharmacy	Fourth	2015 Pattern	2.4.1 T	Physical Pharmaceutics-II	R J Bhor	<p>CO1: To relate the scientific concepts of surface tension, viscosity, micromeritics, kinetics and colloids in connection with preparation, characterization and evaluation of dosage forms.</p> <p>CO2: To explain the various methods for the determination of surface & interfacial tension of liquids, the properties of colloids, properties of powder, order of reactions and flow of fluids.</p> <p>CO3: To describe the rate of reactions, degradation and stability methods of drugs as well as principle and significance of accelerated stability testing.</p> <p>CO4: To illustrate fundamentals and pharmaceutical applications of surface & interfacial tension, kinetics, rheology,</p>
---	-------------------------	--------	--------------	---------	------------------------------	----------	--

						micromeritics and colloids.
			2.4.1 P	Physical Pharmaceutics-II- Pr	R J Bhor	CO1: To determine the surface & interfacial tension of liquids, HLB of surfactants, properties of the powders, kinetic properties of reactions, Colloidal stability and rheological behaviour. CO2: to study various parameters to quantify surface and interfacial, rheological, micromeritic, colloidal and chemical kinetic properties
			2.4.2 T	Pathophysiology & Clinical Biochem	R D Ghogare	CO1: To Explain the application, maintenance and uses of various instruments in clinical biochemistry. CO2: To Know the techniques of biological fluid collection and separation. CO3: To Understand the importance and estimation of various markers for liver, kidney and heart diseases. CO4: To Understand different techniques for the estimation blood glucose, CRP, HbA1c etc and its clinical importance.
			2.4.2 P	Pathophysiology & Clinical Biochem Practical	R D Ghogare	CO1. To Illustrate different techniques of blood collection, preservation and disposal of specimen. CO2. TO Determine qualitative abnormal constituents of urine & Observe chemical examination of stool CO3. To Determine kidney test, liver test, cardiac profile test, C-reactive protein test, CO4. To find blood glucose level and HbA1c11.
			2.4.3 T	Pharmaceutical Organic Chemistry- IV	S D Magar	CO1: To understand principle, synthesis, manufacturing process, of some important heterocyclic and polycyclic compounds CO2: To understand basics of chemical process for new compounds and formulations CO3: To learn Theoretical chemical process, reaction system, chemical equipments used in manufacturing and practical skills of the instruments CO4: To apply Various techniques of combinatorial chemistry and understand applications of combinatorial chemistry in the speedy synthesis of organic compounds and peptides CO5: To remember basics of chemical process for new compounds and formulations

			2.4.3 P	Pharmaceutical Organic Chemistry-	S D Magar	CO1: To design different methods for qualitative analysis of binary mixtures.
--	--	--	---------	--------------------------------------	-----------	--

					IV		CO2: To synthesize the organic compounds by appropriate method. CO3: To synthesize organic compound by using microwave synthesizer. CO4: To assess the reactive groups by quantitative determination.
				2.4.4 T	Pharmaceutical Analysis-II	R K Godge	CO1: To understand principles, instrumentation and applications of various electrochemical techniques employed for the analysis of APIs and formulations CO2: To describe Theoretical and practical skills of instruments CO3. To apply various methods of analysis, parameters for analytical methods and interpretation of data for the analysis of APIs and formulations . CO4. To understand various instrumental techniques.
				2.4.4 P	Pharmaceutical Analysis-II	R K Godge	CO1: To assess purity of Pharmaceutical substances by potentiometric titrations. CO2: To identify pKa of some monobasic, dibasic or tribasic acids of pharmaceutical CO3. To apply calibration of pH meter, Conductometer, Refractometer and Polarimeter. CO4. To identify Refractive Index (RI) and Molar Refraction of pharmaceutically important vegetable oils, glycerin-water mixture and organic solvents.
				2.4.5.T	Pharmacognosy & Phytochemistry II	D N Vikhe	CO1: To describe Definition, classification, occurrences, properties, nomenclature, & chemistry of alkaloids CO2: The knowledge about pharmacognostic study of Alkaloidal drugs containing including history & contribution to modern medicine CO3: To write the Definition, classification, occurrences, properties, nomenclature, & chemistry of Terpenoids & Resins CO4: To asses the pharmacognostic study of crude drugs containing Terpenoids & Resins including history & contribution to modern medicine

			2.4.5.P	Pharmacognosy & Phytochemistry II	D N Vikhe	<p>CO1: To Compare and Contrast the drugs by examining the difference in morphology, microscopy and powdered characteristics.</p> <p>CO2: To examine and findout the various physical evaluation parameters of volatile oils</p> <p>CO3: To examine and find out Phytochemical content in</p>
--	--	--	---------	-----------------------------------	-----------	--

	Third Year B. Pharmacy	S i	2 0 1				Rauwolfia by spectrophotometric methods CO4: To investigate and examine the presence of phytoconstituent by using suitable extraction techniques CO5: To investigate and examine the presence of phytoconstituent by using hydro distillation CO6: To identify and examine the crude drugs by Physical and chemical analysis CO7: To discuss and illustrate the principles and working, processing of fields/farm
				2.4.6 T	Pharmaceutical Engineering	S.S.Siddheshwar	CO1: .To illustrate and explain the principle, theory, mechanism, working and construction of equipments of different unit operations. CO2: To explain, classify and compare various equipents with respect to their applications in pharmacy. CO3: To explain and prioritize the knowledge of product manufacturing with the help of various equipments. CO4: .To Focus on graphical and digramatic representation of various equipments for unit operations.
7				BP 601 T	Medicinal Chemistry -II	A S Dighe	CO1: To illustrate of drug metabolizing enzymes, phase I & phase CO2: 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 recent developments in the CNS active drug CO3: To Explain design of the drugs, history, classification, nomenclature, SAR, mechanism of action, therapeutic uses, adverse effects, synthesis of drugs and recent developments in the CNS Stimulants CO4: To Explain design of the drugs, history, classification, nomenclature, SAR, mechanism of action, therapeutic uses, adverse effects, synthesis of drugs and recent developments in the CNS depressant

			BP 607 P	Medicinal Chemistry -II	A S Dighe	<p>CO1: To analyze & Separate solvents or substances by steam distillation.</p> <p>CO2: To synthesize the following drug a. Phenytoin from benzoinb. Benzocaine from PABA</p> <p>CO3: To Explain method for synthesis of medicinally important organic compounds using microwave assisted organic synthesis</p> <p>CO4: To identify the synthesized compounds by Thin layer chromatography & purified of synthesized compound by Column chromatography.</p>
			BP 602 T	Pharmacology-III	S. B. Dighe	<ul style="list-style-type: none"> • CO 1 : To know pharmacology and pharmacotherapy of various general and local anesthetics. • CO 2: To identify appropriate drug therapy and management of patients with specific CNS disorders. • CO 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. <p>CO 4: To describe Pharmacological features of different</p>

				BP 608 P	Pharmacology-III Practical	S. B. Dighe	CO 1: To understand the basic principles of bioassay, types of bioassay along with advantages and disadvantages. CO 2: To know Performance of isolated experiments using various isolated preparation and the effect of different drugs on the concentration response curves. CO 3: To study the preclinical screening of various drugs.
				BP 605 T	Pharmaceutical Biotechnology	S.D.Mankar	CO 1: To study animal cell culture CO 2: To explain different enzyme mobilization technique CO 3: To understand different fermentation techniques
				BP 604 T	Bio-pharmaceutics & Pharmacokinetics	RB Laware	CO 1 : To describe the concept of biopharmaceutics and its applications in formulation development. CO 2: To explain and apply knowledge of pharmacokinetic processes designing pharmaceutical dosage form. CO 3: To discuss the concepts of bioavailability and bioequivalence studies. CO 4: To explain various compartmental models and non-compartmental analysis methods. CO 5: To explain and apply concept and mechanisms of dissolution and in vitro in vivo correlation
				BP606 T	Quality Assurance Techniques	R.B.Laware	CO1: To Describe the quality, quality assurance, quality control and IPQC in pharmaceutical industry CO2:: To Explain the Calibration and Qualification in Quality

				BP 603T	Herbal Drug Technology	D.N.Vikhe	CO1: To explain herbal formulation and standardization technique CO 2: To understand herbal cosmetics and standardization technique CO 3: To understand screening of herbal drugs
--	--	--	--	---------	------------------------	-----------	---

				BP 609P	Herbal Drug Technology	D.N.Vikhe	CO 1: To understand preliminary Phytochemical investigation of crude drugs CO 2: To explain isolation and Phytochemical identification of crude drug CO 3: To Prepare herbal formulation
8	Final Year B. Pharmacy	Eight	2015 Pattern	4.8.1 T	Advanced Drug Delivery System	MH Kolhe	CO1: To understand the Fundamental Concept of Modified Drug Release and Pre requisites of drug candidates, along with various approaches and classification. CO2: To learn concept of polymers and its classification, types, selection, application and examples. CO3: To understand the concept of formulation, merits, demerits, application and evaluation of Novel Drug Delivery Systems and optimization. CO4: To learn the Therapeutic Aerosols along with typical formulations from, metered dose, intranasal and topical applications. CO5: To learn the concept of microencapsulation, merits, demerits and application, Types of Microencapsulation and Evaluation of microcapsules.
				4.8.1 P	Advanced Drug Delivery System	MH Kolhe	CO1:. To compare and contrast and design various tablets. CO2: To compare and contrast various polymers. CO3:. To compare and contrast and design various NDDS. CO4: To compare and contrast and design various microcapsules.

				4.8.2 T	Cosmetic science	S.S.Siddheshwar	CO1: To illustrate concepts of cosmetics, anatomy of skin v/s hair and to categorize and justify general excipients used in cosmetics. CO2: .To design and examine and manufacture formulation of various cosmetics. CO3: To explain the concept of cosmeceuticals, history, compare and contrast cosmetics ,cosmeceuticals&cosmeceutical agents.
				4.8.2 P	Cosmetic science	S.S.Siddheshwar	CO1: To design and examine the various dosage forms. CO2: To explain the correct use of various equipments in pharmaceuticals laboratory relevant to cosmetics. CO3: .To design and examine the various dosage forms.
				4.8.3. T	Pharmaceutical Analysis VI	G S Shinde	CO1: To explain theoretical, Practical parameters of NMR spectroscopy, and assess organic compound using NMR data and outline FT-NMR and C13 NMR CO2: To illustrate principle, instrumentation, application of Electron spin resonance CO3: To understand principle,instrumentation, application of Ion exchange chromatography and capillary electrophoresis CO4: To explain principle ,instrumentation ,application of high Performance liquid chromatography and compare HPLC with UPLC CO5: To explain principle,instrumentation and application of mass spectrometry and hyphenated techniques like GC-MS,LC-MS,MS-MS
				4.8.3. P	Pharmaceutical Analysis VI	G.S.Shinde	CO1: To illustrate and examine Validation of analytical methods CO2: To describe the system suitability parameters CO3: To understand quantitation technique and identify API in bulk and formulation CO4: To illustrate knowledge in interpretation of UV, IR, NMR, MS spectra's and examine structure of organic compound

			4.8.4 T	Medicinal Chemistry -IV	N.S.Dighe.	<p>CO1: To Examine the general aspects of the design and development of drugs including history, classification, nomenclature of antihistaminic, autacoids, NSAID's, narcotic, steroidal, hormones, insulin, oral antihypoglycemic, diagnostic and serotonergic agents</p> <p>CO2: To Describe and discuss the drug design including SAR and mechanism of action of antihistaminic, autacoids, NSAID's, narcotic, steroidal, hormones, insulin, oral antihypoglycemic,</p>
--	--	--	---------	-------------------------	------------	--

						<p>diagnostic and serotonergic agents. agents.</p> <p>CO3: Explain and illustrate adverse effects, therapeutic uses and recent developments of antihistaminic, autacoids, NSAID's, narcotic, steroidal, hormones, insulin, oral antihypoglycemic, diagnostic and serotonergic</p> <p>CO4: To Designscheme of synthesis of drugs of antihistaminic, NSAID's, narcotic, steroidal insulin and oral antihypoglycemic.</p>
			4.8.4 P	Medicinal Chemistry -IV	N.S.Dighe.	<p>CO1:To synthesize the medicinally important compound by appropriate method</p> <p>CO2: To identify a proper method for purification of synthesized compounds by column chromatography</p> <p>CO3: To examine prepared compounds by preparative TLC Method and IR Spectroscopy</p> <p>CO4: To Outline the method for high vacuum distillation and CADD technique.</p>
			4.8.5 T	Pharmacology-V including biostatistics	S. B. Bhawar	<p>CO1: To describe various methods of drug-drug interaction inside the body.</p> <p>CO2: To discuss the mechanism of adverse drug reactions and pharmacovigilance.</p> <p>CO3: To restate knowledge about recent development in pharmacology</p> <p>CO4: To explain different aspects of hospital pharmacy and clinical trials</p>
			4.8.5 P	Pharmacology-V	S. B. Bhawar	<p>CO1: To illustrate the in vivo and in vitro experiments, drug antagonism</p> <p>CO2: To compare and contrast use of software for the study of preclinical experiments.</p> <p>CO3: To explain statistics, relate its applications and how to solve problems using various statistical tests.</p> <p>CO4: To assess statistical problems using suitable software.</p>
			4.8.6.T	Natural Product: Commerce , Industry & Refulations	R.S.Jadhav	<p>CO1: To discuss importance of natural product and explain demand and supply of natural product</p> <p>CO2: To categorize and illustrate herbal drug industry</p> <p>CO3:..To learn patenting of herbal/natural drugs</p> <p>CO4: To investigate safety monitoring of herbals in pharmacovigilance systems</p> <p>CO5: To discuss plant allergens and examine plant allergens</p>

			4.8.7 T	Quality Assurance Techniques	R.B.Laware	CO1: To Describe the quality, quality assurance, quality control and IPQC in pharmaceutical industry CO2:: To Explain the Calibration and Qualification in Quality
--	--	--	---------	------------------------------	------------	---

							Assurance CO3:: To Understand the GMP, GLP and GDP while working in pharmaceutical industry with document and record CO4:: To Explain the Pharmaceutical Validation in QA CO5:: To Recognize the regulatory agencies and explain the concept of QbD
--	--	--	--	--	--	--	---

Sr. No	Class	Semester	Curriculum Pattern by SPPU	Course Code	Name of course	Name of staff	Course Outcomes
1.	First Year M.Pharmacy- Pharm. Q.A.	F i	2 0 1	MPC 101T	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	N S Dighe	CO1: To describe and understand identification characterization and quantification of drugs using instrumental techniques. CO2: To learn and understand principle and instrumentation of different spectroscopic techniques. CO3: To learn and understand principle and instrumentation of different chromatographic techniques CO4: To learn and understand principle and instrumentation of electrophoresis and Xray techniques CO5: To understand application of different instrumental techniques.
2.				MQA102T	Quality Management System	SD Mankar	CO1: To explain the importance of quality, justify the parameter affect the quality. CO2: To understand the six system inspection model. CO3: To explain drug stability and justify design & process development. CO4: To examine the statistical process control for quality & to plan for statistical process control.
3.				MQA103T	Quality Control and Quality Assurance	MH Kolhe	CO1: To explain concept of Quality Control, Quality Assurance and Documentation in pharmaceutical industry. CO2: To discuss cGMP guidelines and use of it in pharmaceutical industry. CO3: To investigate raw material and finished product. CO4: To illustrate Manufacturing operations and controls: Sanitation of manufacturing premises.

4.			MQA104T	Product Development and Technology transfer	RB Laware	CO1: To describe and understand the principles of new drug discovery and development CO2: To explain role of preformulation, stability study and pilot plant scale up in drug product development CO3: To explain role of packaging material in pharmaceutical
----	--	--	---------	---	-----------	---

						dosage forma and their quality control test CO4: To discuss and apply various aspects of technology transfer from R&D to actual manufacturing
5.				MQA105P	Pharmaceutical quality assurance Practical I	R.J.Bhor CO1: To Analyse quantitatively organic and inorganic constituents by using Instrumental Methods of Analysis CO2: To build case studies and protocol of various processes of quality assurance and quality control CO3: To evaluate preformulation parameters, in process, finished product and packaging material quality.
6.				MPC102T	Advance Organic Chemistry 1	H S Bhawar 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 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 reterosynthesis and the concept of disconnection to develop synthetic routes for small target molecule
7.	First Year M.Pharmacy- Pharm. Chemistry			MPC 103T	ADVANCED MEDICINAL CHEMISTRY	K V Dhamak CO1: To Understand the importance of drug design and different techniques of drug design. 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

8.			MPC 104 T	Chemistry of Natural Products	R K Godge	CO1: To understand different types of natural compounds and their chemistry and medical importance
----	--	--	-----------	----------------------------------	-----------	---

						<p>CO2: To apply the importance of natural compound as lead molecule for new drug discovery.</p> <p>CO3: To analyze general methods of structural elucidation of compounds of natural origin</p> <p>CO4: To evaluate isolation, purification, and characterization of simple chemical constituent from natural source</p>
9.				MPC 105P	PHARMACEUTICAL CHEMISTRY PRACTICAL – I	N S Dighe <p>CO1: To learn the concept of disconnection to develop synthetic routes for small target molecule.</p> <p>CO2: 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.</p> <p>CO3: 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</p> <p>CO4: To Explain development of different techniques of organic synthesis and their applications to process chemistry as well as drug discovery.</p> <p>CO5: 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.</p>
10.				MPG102T	Advanced Pharmacognosy I	Priya Rao <p>CO1:- To get Brief knowledge about specific care in herbal material, & various approaches in extraction processes with their theoretical consideration, methodological steps, & applications.</p> <p>CO2:- To Know various chromatographic & non-chromatographic separation methods.</p> <p>CO3:- To understand theoretical To understand source material & extraction methods of phytochemicals specified; and to draw schematic representation of such processes.</p> <p>CO4:- To Study need of analysis of natural products & explain their significance; Understand & explain various parameters with their principles, significance & applications.</p>

11.				MPG103T	Phytochemistry	S R Vikhe	<p>CO1:- To discuss the skills for Separation of the active constituents obtained from natural sources and different methods of separation .</p> <p>CO2:-To identify the active ingredients and methods to evaluate natural components .</p> <p>CO3:-To explain the actual process of Herbal Drug discovery and development.</p>
-----	--	--	--	---------	----------------	-----------	---

							CO4:- To compare and contrast extraction, Isolation and Phytochemical analysis of Natural products. CO5:- To predict the principle of sophisticated instruments and study of chromatographic fingerprinting methods
12.				MPG104T	Industrial Pharmacognostical technology	R S Jadhav	CO1:- To identify requirement for setting of herbal drug industry. CO2:- To learn guidelines for quality and regulatory issues of herbal /natural medicines . CO3:- To explain and compare general parameters of monographs of herbal drugs as per various pharmacopeia. CO4:- To assess various clinical laboratory and stability testing of herbal drugs. CO5:- To learn patenting of herbal/natural drugs.
13.				MPG105T	Pharmacognosy Practical I	R S Jadhav/ Priya Rao	CO1:- To illustrate the Pharmacopoeial compounds of natural origin and formulations by UV Vis spectrophotometer. CO2:- To design Estimation of sodium/potassium by flame photometry CO3:- To investigate Development of fingerprint of medicinal plant extracts used in herbal drug industry by TLC/HPTLC method. CO4:- To identify the Methods of extraction and phytochemical screening . CO5:- To predict the Monograph analysis of clove oil and castor oil.
		S e		MQA201T	Hazards and safety	MH Kolhe	CO1: To explain Natural resources and associated problems
15.					Management		CO2: To discuss Types of Hazards and its prevention. CO3: To Classify chemical based hazards and their control measures. CO4: 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

16.			MQA202T	Pharmaceutical Validation	RB Laware	CO 1. To describe various aspects of validation and IPR CO 2. To discuss and apply the concepts of validation of equipment and instruments, analytical methods and cleaning processes in pharmaceutical manufacturing CO 3. To discuss and Design validation documents, plant lay out of processing and testing area, check list for pharmaceutical manufacturing processes
-----	--	--	---------	---------------------------	-----------	--

17.				MQA203T	Audits and regulatory compliance	S S Siddheshwar	CO1: To explain the importance of auditing. CO2: To compose the auditing report and check list for auditing CO3: To plan out the audit process. CO4: To compose the auditing report And check list for auditing. CO5: To illustrate the methodology of auditing
18.				MQA204T	Pharmaceutical manufacturing technology	S.D.Mankar	CO1: To identify the legal requirements and licenses for API & formulation industry and Justify the plant location factors influenced on API & formulation industry. CO2: To design & construct Non sterile manufacturing process technology in pharmaceutical industry CO3: To explain the importance of Quality by design (QbD) and process analytical technology in pharmaceutical industry. CO4: To design and construct aseptic process technology in pharmaceutical industry.
19.				MQA205P	Pharmaceutical Quality assurance Practical II	RB Laware	CO1: To Validate equipment and instruments, analytical methods and cleaning processes CO2: To Design validation documents, plant lay out of processing and testing area, check list for pharmaceutical manufacturing processes CO3: To build case studies of various processes of quality assurance and quality control CO4: To Analyse quantitatively organic and inorganic constituents by using Instrumental Methods of Analysis
20.				MPC 201 T	Advanced spectral Analysis	G S Shinde	CO1: To discuss interpretation of organic compound by using UV,IR ,mass spectroscopy CO2: To understand theoretical technique of NMR spectroscopy and assess organic compound using NMR data CO3: To explain principle, instrumentation and application Chromatographic and its hyphenated analytical technique CO4: To illustrate principle, instrumentation and use of DTA,DTA and TGA. CO5: To discuss the general theory and principles of bioassay , ELISA and assess quantity of Digitalis and insulin

21.				MPC202T	Advance Organic Chemistry 2	H S Bhawar	<p>CO1:To discuss the principle of Green Chemistry and use techniques of green chemistry in synthesis of pharmaceutical compounds.</p> <p>CO2: To understand Chemistry of peptides and use solid phase and solution phase synthesis reaction for synthesis of</p>
-----	--	--	--	---------	-----------------------------	------------	---

							pharmaceutical compounds. CO3: To learn principle and mechanism for photochemical and pericyclic reaction CO4: To explain basic concept of Stereochemistry & Asymmetric Synthesis using chiral pool, chiral axillaries. CO5: To classify and explain use of various catalyst in heterogeneous and homogeneous reactions and transitional phase transfer, and bio catalysis reactions.
22.				MPC 203 T	Computer Aided Drug Design	R K Godge	CO1: To understand the role of CADD in drug discovery CO2: To describe different CADD techniques and their applications CO3: To analyze the various strategies to design and develop new drug like molecules. CO4: To illustrate working with molecular modeling software”s to design new drug molecules CO5: To describe the in silico virtual screening protocols.
23.				MPC 204T	Pharmaceutical Process Chemistry	M S Bhosale	CO1: To illustrate the process chemistry and stages of scale-up CO2: To understand the unit operation extraction, filtration, distillation, evaporation CO3: To learn the unit process of nitration , halogenations, oxidation, reduction CO4: To explain the fermentation of antibiotic, vitamin, static CO5: To understand industrial safety and fire hazards safety assessment series

24.				MPC 205P	PHARMACEUTICAL CHEMISTRY PRACTICAL – II	N S Dighe	<p>CO1: 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</p> <p>CO2: 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</p> <p>CO3: 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</p> <p>CO4: To examine development of different techniques of organic synthesis and their applications to process chemistry as</p>
-----	--	--	--	----------	---	-----------	---

						well as drug discovery CO5: 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.
25.				MPG201 T	Medicinal Plant Biotechnology	Priya Rao CO1:- To provide students with the necessary skills to learn different methods of tissue culture CO2:- To study the various tissue culture techniques CO3:- To explain the various immobilisation techniques and to study the metabolites CO4:- To learn various biotransformation techniques CO5:- To learn various fermentation techniques
26.				MPG202 T	Advanced Pharmacognosy II	S R Vikhe CO1:- To assess the Efficacy of Herbal medicine products CO2:- To discuss the methods of screening of herbals for various biological properties CO3:- .To investigate the analytical profiles CO4:- To investigate the analytical profiles of herbal drugs of herbal drugs CO5:- .To examine ethnobotany in herbal drug evaluation and Impact of Ethnobotany in traditional medicine
27.				MPG203T	Indian System of Medicine	D N Vikhe CO1:- Acquire knowledge of Primary concepts of traditional system of medicine as well as Formulation development and standardization of various traditional dosage forms CO2:- Describe the Basic principles and healing potentials of Yoga, Naturopathy and Aromatherapy. CO3:- . The course aims to provide students with the necessary skills in learning and acquiring knowledge in Formulation, development and standardization of various traditional formulations. CO4:- 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.

28.			MPG204T	Herbal Cosmetics	R S Jadhav	CO1:- To understand the basic principles of herbal cosmetics CO2:- To learn the current good manufacturing practices of herbal cosmetics
-----	--	--	---------	------------------	------------	---

							CO3:- To understand the various types of herbal cosmetics used.
29.				MPG205 P	Pharmacognosy-II	Mr.D.N.Vikhe	CO1:- To illustrate the Isolation of nucleic acid. CO2:- To design the Quantitative estimation of DNA, CO3:- To identify total phenolic, total flavonoid content and total alkaloid content in herbal raw materials. CO4:- To investigate the Preparation and standardization of various simple dosage forms from traditional medicine. CO5:- To assess the herbal formulation and herbal cosmetic product.



Principal
Pravara Rural College of Pharmacy
Pawarwadi, Ahtol-413 736

Principal



Principal
Pravara Rural College of Pharmacy
Pawarwadi, Ahtol-413 736