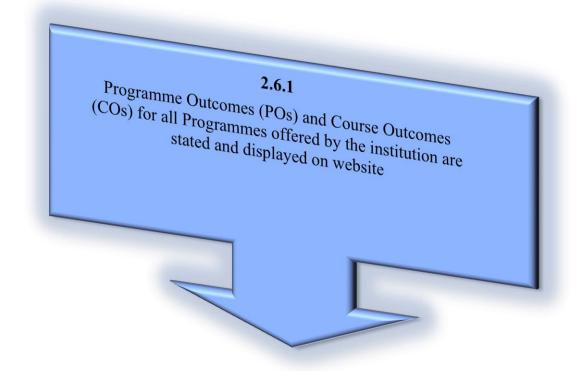
Tatyasaheb Kore College of Pharmacy, warananagar

Tal.: Panhala, Dist.: Kolhapur, Maharashtra, India, Pin: 416 113 Website: www.tkcpwarana.ac.in

Criteria 2: Teaching-learning and Evaluation

Key Indicator 2.6: Student Performance and Learning Outcomes





Tatyasaheb Kore College of Pharmacy, Warananagar

Tal.: Panhala, Dist.: Kolhapur, Maharashtra, India, Pin: 416 113 Website: www.tkcpwarana.ac.in

Criteria 2: Teaching-learning and Evaluation Key Indicator 2.6: Student Performance and Learning Outcomes



PROGRAM EDUCATIONAL OBJECTIVES

PEO 1: Knowledge Domain

To generate and dissipate updated knowledge in pharmaceutical and allied fields including; Pharmaceutical chemistry, Pharmaceutics, Pharmacology, Pharmacognosy, Pharmaceutical analysis, Quality assurance, Clinical testing and pharmacovigilance, Microbiology and immunology, Molecular biology and biotechnology, Bio-statistics etc.

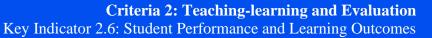
PEO 2: Skill Domain

To instil technical, professional, leadership and interpersonal skills in the graduates in pharmaceutical sciences

PEO 3: Values System Domain

- To develop attitude of self-awareness, self-discipline, honesty, empathy, self-motivation, 'lifelong learning', social skills etc by encouraging graduates to organize and participate various activities including workshops, conferences, seminars, symposiums, competitions etc.
- To ingrain creativity, innovation and diverse thinking in the graduates
- To develop entrepreneurial mindset and employability in the graduates

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PROGRAM OUTCOMES

PO1	Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioural, social, and administrative pharmacy sciences; and manufacturing practices			
PO2	Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines			
PO3	Problem analysis: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice; and also find, analyze, evaluate and apply information systematically and shall make defensible decisions			
PO4	Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations			
PO5	Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfilment of practice, professional and societal responsibilities; also assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing			
PO6	Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees)			
PO7	Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts; demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles; use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions			
PO8	Communication : Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions			
PO9				
PO10	Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development			
PO11	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change; and also self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis			

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Criteria 2: Teaching-learning and Evaluation Key Indicator 2.6: Student Performance and Learning Outcomes



COURSE OUTCOMES

Name of the	Name of the Course	Course Outcomes
Program		
and		
Semester		
B. Pharm.	BP101T	1. Understanding of structure and functions of
1st Semester	Human anatomy and	cells, tissues, organs of human body
	Physiology-I	2. Knowledge about various homeostatic
		mechanisms and their imbalances
		3. Ability to perform various experiments related
		to special senses and the nervous system
		4. Understanding of the coordinated functioning
	DD102E	of the various organs of each system
	BP102T	1. Understanding of the fundamentals of
	Pharmaceutical	analytical chemistry
	Analysis-I	2. Skills to prepare solutions of different strengths3. Ability to predict and identify the sources of
		mistakes and errors in analytical chemistry
		4. Understanding of the fundamentals of
		volumetric analytical skills
		5. Knowledge of the principles of electrochemical
		analytical techniques
	BP103T	1. Know the history of pharmacy profession
	Pharmaceutics-I	2. Understanding of the basics of different
		pharmaceutical dosage forms
		3. Understanding of the concept of posology, and
		paediatric dose calculation
		4. Ability to do pharmaceutical calculations
		5. Ability to identify and avoid pharmaceutical
		incompatibilities
		6. Understanding of parts of prescriptions and
		ability of handling of prescriptions
		7. Knowledge of basic methods of preparation and evaluation studies of various conventional
		dosage forms
	BP104T	1. Knowledge of the sources of impurities and
	Pharmaceutical	methods of impurities determination in
	Inorganic Chemistry	inorganic drugs and pharmaceuticals
	<i>Gn y</i>	2. Understanding of the medicinal and
		pharmaceutical importance of inorganic
		compounds
		3. Knowledge of different types of diagnostic
		agents, dialysis fluids and dental products

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	1	Understanding of definitions, methods of
	4.	preparations and assay procedures of
		gastrointestinal agents, expectorants,
	_	haematinics, astringents and antidotes
	٥.	Knowledge of storage conditions and
		pharmaceutical applications of
		radiopharmaceuticals, measurement methods
DD105E	1	of radioactivity
BP105T	1.	Understanding of the behavioural needs for a
Communication		pharmacist to function effectively in the areas
Skills		of pharmaceutical operations
	2.	Ability to communicate effectively (verbal and non-verbal)
	3	Ability to effectively manage the team as a team
	٥.	player
	4	Understanding of Do's and Don'ts of an
	7.	interview
	5	Ability to apply communication skills
	٥.	effectively
	6	Understanding of essential leadership qualities
BP106RMT	_	Understanding of the role and applications of
Remedial Maths	1.	mathematics in pharmacy
Remediai Matins	2.	
	2.	calculus, and matrices and others
	3	Understanding of creative techniques to the
	J.	solutions of mathematical problems
	4.	Ability to apply a range of techniques
		effectively to solve problems including theory
		of deduction, approximation, and simulation
BP106RBT	1.	
Remedial Biology		animal cells
	2.	Understanding of classification of plants and
		animals
	3.	Understanding of structures and functions of
		various plant and animal cells, tissues, and
		organs systems
	4.	
	5.	Understanding of anatomy and physiology of
		plants and animals
BP107P	1.	Understanding of human anatomy and
Human anatomy and		physiology
Physiology Practical	2.	
, 2,		processes
		1

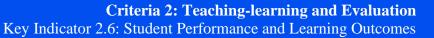
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	3.	Knowledge of structures and functions of
		human cells, tissues, organs and systems
	4.	Ability to do experiments related to special
		senses and the nervous system
BP108P	1.	Skills to determine concentration of primary
Pharmaceutical		standards
Analysis-1 Practical	2.	Skills to do assay and necessary calculations to
,		determine % purity independently
	3.	
		do necessary calculations independently
BP109P	1.	
Pharmaceutics-I		pharmaceutical dosage forms
Practical	2.	Understanding of the prescription and
1100000	_,	commonly used Latin terms in pharmacy
		practice practice
	3.	1
		liquid formulations independently
	4.	Skills of compounding, labelling and
		dispensing of extemporaneous preparations
BP110P	1.	
Pharmaceutical	2.	1
Inorganic Chemistry		salts through various qualitative tests
Practical		independently
	3.	*
		compounds as per IP
	4.	Knowledge and skills to prepare inorganic salts
		-boric acid, potash alum and ferrous sulphate
BP111P	1.	
Communication		and with enthusiasm
Skills Practical	2.	Knowledge of different styles of
		communication
	3.	Understanding of the nuance of communication
		Skills of effective presentation
		Comprehending various aspects of interview
		skills
	6.	Ability to design efficient and effective resume,
		CV, biodata
BP112RBP	1.	Understanding of functioning of different types
Remedial Biology		of microscopes
Practical	2.	•
	3.	
		techniques used to check different body part
		functions

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Name of the Program	Name of the Course	Course Outcomes
and	Course	
Semester		
B. Pharm.	BP201T	1. In-depth Knowledge of gross morphology,
2 nd	Human Anatomy	structure and functions of various organs of the
Semester	and Physiology-II	human body
	, ,	2. Ability to describe various homeostatic
		mechanisms and their imbalances
		3. Skills to identify the various tissues and organs of
		different systems of human body
		4. Understanding of the coordinated working pattern
		of different organs of each system
		5. Understanding of the interlinked mechanisms in
		the maintenance of normal functioning
		(homeostasis) of human body
	BP202T	1. Knowledge of the classification of organic
	Pharmaceutical	compounds and nomenclature
	Organic	2. Understanding of the concept of classification
	Chemistry-I	isomerism and explain structural isomerism
		3. Knowledge of hybridisation in alkenes, alkenes
		and stabilities of alkenes, conjugated dienes
		4. Understanding of the mechanism, orientation of
		elimination, Electrophilic, free radical and
		Nucleophilic addition reaction
		5. Knowledge of the mechanism, kinetics,
		stereochemistry and factors affecting SN1 & SN2
		reaction
		6. Understanding of the acidity of carboxylic acids
		and basicity of amines
		6. Through understanding of the mechanism of some named reaction
	BP203T	1. Understanding of the catalytic role of enzymes,
	Biochemistry	importance of enzyme inhibitors in design of new
		drugs, therapeutic and diagnostic applications of
		enzymes
		2. Understanding of the metabolism of nutrient
		molecules in physiological and pathological
		conditions
		3. Understanding of the genetic organization of
		mammalian genome and functions of DNA in the
		synthesis of RNAs and proteins

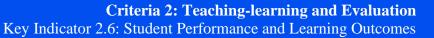
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		4. Knowledge of how physiological conditions
		influence the structures and re-activities of
		biomolecules
		7. Knowledge of bioenergetics
-	BP204T	1. Knowledge of the etiology and pathogenesis of the
		disease states
	Pathophysiology	
		2. Ability to identify signs and symptoms of the
		different illnesses
		3. Ability to find complications of the diseases
		5. Understanding of the pathophysiological
		conditions and its mechanisms
	BP205T	1. Knowledge of the concept of number system in
	Computer	computers
	Applications in	2. Ability to make use of web technologies such as
	Pharmacy	HTML, XML, CSS, programming languages, Web
	1 Harmacy	
		servers and pharmacy drug database
		3. Competency applying computers in pharmacy
		such as drug information services,
		pharmacokinetics, mathematical model in drug
		design, hospital and clinical pharmacy etc.
		4. Knowledge of computers for data analysis in
		preclinical development
-	BP206T	1. Knowledge of ecological perspective and value of
	Environmental	environment
	Sciences	2. Understanding of the significance of various
	Belefices	natural resources and its management
		3. Comprehensive understanding of world's
		biodiversity and the importance of its conservation
		4. Knowledge of different types of pollutions and
		their control measures as well as effective methods
		of waste treatments
		5. Ability to analyze global environmental problems
		and come out with best possible solutions
		4. Understanding of environmental laws and
		sustainable development
-	BP207P	1. Skills to identify the various tissues and organs of
		· ·
	Human Anatomy	different systems of human body
	and Physiology- II	2. Understanding of the coordinated working pattern
	Practical	of different organs of each system
		3. Ability to perform the various experiments related
		to special senses and nervous system
		4. Ability to perform the experiments like
		neurological reflex, body temperature

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		10 1' 0' 1
		measurement, olfaction, gustation reflex and eye sight etc.
	6.	Knowledge of application of qualitative test and
		structure of organic compounds of medicinal importance
BP208P	1	Knowledge of safety measures in organic
Pharmaceutical	1.	chemistry laboratory and various laboratory
Organic		techniques
Chemistry-1	2	Understanding of steps involved in identification
Practical	۷.	of unknown organic compound
	3.	Ability to prepare suitable solid derivatives from
		organic compounds
	5.	Skills to prepare stereo models containing various
		functional groups
BP209P	1.	Ability to perform qualitative analysis of
Biochemistry		carbohydrates and proteins, independently
Practical	2.	Ability to estimate blood glucose and blood
		cholesterol levels, independently
	3.	Skills to perform qualitative analysis of urine for
		abnormal constituent
	4.	Ability to determine salivary amylase activity and
		study the effect of temperature on salivary amylase
BP210P	1	activity, independently Compared by to use MS Word, independently
-	1. 2.	1 3
Computer Applications in	3.	Skills to create HTML web page, independently Ability to generate MS access database to store the
Pharmacy	٥.	data of patient and drug information,
Practical		independently
Tractical	4	Ability to create mailing labels using Label
		wizard in MS Word, independently

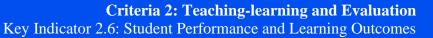
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Name of the Program and Semester	Name of the Course	Course Outcomes
B. Pharm. 3 rd Semester	BP301T Pharmaceutical Organic Chemistry-II BP302T	 Ability to draw structures, identify names and types of isomerism of organic compounds Knowledge and skill of writing reactions, identifying names of the reactions and solve the problems associated Understanding of reactivity and stability of organic compounds Ability to synthesize organic compounds Understanding of physicochemical properties of
	Physical Pharmaceutics-I	drugs influencing drug product development 2. Knowledge of principles of chemical kinetics and its applications in stability studies and shelf-life determination 5. Ability to related effect of physicochemical properties on performance of drug product
	BP303T Pharmaceutical Microbiology	 Knowledge of the structures, classifications, and morphology of microorganisms Understanding of the applications of microorganisms in various industries, including pharmaceuticals, food, milk, oil, etc Comprehending the methods of cultivation, preservation, and identification of microorganisms Understanding of the significance of sterilisation in pharmaceuticals and other industries and the sterility testing of pharmaceuticals Ability to perform microbiological standardisation of pharmaceuticals Understanding of microbial spoilage of pharmaceuticals and ways to preserve pharmaceuticals
	BP304T Pharmaceutical Engineering	 Understanding of the nature of flow of fluids and its applications in pharmaceutical industry Knowledge and skills to apply knowledge about the size reduction and size separation to produce pharmaceutical dosage forms Understanding of and design pharmaceutical plant layouts with optimum use of resources Ability to apply various preventive methods used for corrosion control in pharmaceutical industries

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BP305P Pharmaceutical Organic Chemistry-II Practical BP306P Physical Pharmaceutics-I Practical	 Competencies to apply knowledge about pharmaceutical processing equipment in evaporation, drying, distillation etc. in qualifying, calibrating and validating the equipment Understanding of the concepts of heat transfer and apply it in equipment selection, process designing and optimization Skills to carry recrystallisation and steam distillation, independently Ability to perform separation and identification of qualitative analysis of solid-solid organic binary mixtures Ability to determine the saponification value of oil sample, independently Synthesize the different organic compounds and Understanding of the reaction mechanisms Ability to do solubility measurement, independently Skills to determine partition coefficient, independently Ability to develop phase diagram and determine CST Skills to determine surface and interfacial tension values by different methods, independently Ability to determine HLB, CMC, saponification values of surfactants, independently Knowledge of adsorption isotherms, protein binding and complexation in dosage forms Ability to determine stability constant,
BP307P Pharmaceutical Microbiology Practical	independently 1. Ability to use various equipment used in pharmaceutical microbiology 2. Skills to prepare and sterilize different types of media required for the cultivation of microorganisms 3. Competencies to identify the type of microorganisms by staining techniques and motility by hanging drop technique, independently 4. Ability to perform and interpret biochemical tests, bacteriological analysis, and microbiological assay 7. Skills to follow aseptic practices

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BP308P	1. Ability to construct the drying curve and determine
Pharmaceutical	the time required for drying, independently
Engineering	2. Competencies to determine the loss on drying and
Practical	moisture content by themselves
	3. Ability to determine air humidity, independently
	4. Skills to determine the factors affecting the
	pharmaceutical engineering process and its
	application for product development
	5. Ability to perform particle size reduction and
	analysis, independently

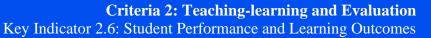
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Name of the	Name of the	Course Outcomes
Program	Course	
and		
Semester		
B. Pharm.	BP401T	1. Knowledge of the classification of organic
4 th Semester	Pharmaceutical	compounds and nomenclature
	Organic	2. Understanding of the concept of classification
	Chemistry-III	isomerism and explain structural isomerism
		3. Knowledge of hybridisation in alkenes, alkenes and stabilities of alkenes, conjugated dienes
		4. Understanding of the mechanism, orientation of
		elimination, electrophilic, free radical and
		nucleophilic addition reaction
		5. Knowledge of the mechanism, kinetics,
		stereochemistry and factors affecting SN1 & SN2
		reaction
		6. Understanding of the acidity of carboxylic acids
		and basicity of amines
		7. Understanding of the mechanism of some named
		reaction
	BP402T	1. Ability to correlate the disease pharmacology with
	Medicinal	chemical aspects of drugs
	Chemistry-I	2. Understanding of the metabolic pathways, adverse
		effects, and therapeutics of drugs 3. Understanding of the structural correlations of
		different classes of drugs
		4. Skills to synthesize drug, independently
		5. Knowledge of the mechanistic pathways of
		different classes of medicinal compounds
	BP403T	1. Knowledge of physicochemical properties of
	Physical	drugs and ability to apply it further in drug product
	Pharmaceutics-II	development
		2. Competencies carrying stability studies and
		determining expiry dating of pharmaceuticals
		3. Understanding of physicochemical properties of
		drug and excipient significant to development and evaluation of dosage forms
		4. Understanding of the role of surfactants, interfacial
		phenomenon and thermodynamics in product
		development
	BP404T	1. Understanding of the pharmacological actions of
	Pharmacology-I	various categories of drugs
		2. Recognizing how drugs work at the organ, sub-
		cellular, macromolecular levels

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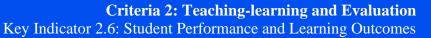


BP405T Pharmacognosy and Phytochemistry I	 Ability to apply basic pharmacological knowledge in preventing and treating various illnesses Ability to analyse the impact of drugs on animals through simulation experiments Knowledge regarding herbs, and their science Ability to classify medicinal plants and their phytochemistry Understanding of pharmacology and toxicity of
Phytochemistry-I	 Understanding of pharmacology and toxicity of herbal formulations Knowledge of how herbs influence our physiology and can be helpful against several disorders Understanding of complementation of traditional systems of medicines to modern medical science (allopathy) Ability to identify adulteration and contamination in herbs
BP406P Medicinal Chemistry-I Practical	 Skills in various purification techniques of solvents/ liquids used in synthesis. Understanding of safety measures in the chemistry laboratory Competencies synthesizing drugs and evaluating for their physicochemical properties Knowledge of basic chromatographic techniques like TLC, and column chromatography for the identification and purification of compounds Understanding of the reaction mechanism of synthesized organic compounds
BP407P Physical Pharmaceutics-II Practical	 Ability to determine the powder characteristics of drug like particle size, size distribution by sieving and microscopic methods, independently Skills to determine the viscosity of liquid with the help of Brookfield viscometer by their own Ability to determine the effect of various excipients on flow properties of the powder materials and its applications in product development Skills to perform the accelerated stability study of the product and to determine the stability of product
BP408P Pharmacology-I Practical	 Understanding of the pharmacological actions of different categories of drugs Ability to observe any analyse effect of drugs on animals by simulated experiments

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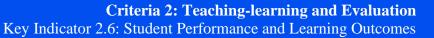
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	5. Ability to appreciate correlation of pharmacology with other bio medical science
BP409P	1. Understanding of the chemical nature of crude
Pharmacognosy	drug by chemical tests
and	2. Skills to perform stomatal number, stomatal index,
Phytochemistry-I	vein islet number, vein islet termination and
Practical	palisade ratio of leaf drug
	3. Ability to determine size of starch grains, calcium
	oxalate crystals, length and width of fiber of the
	sample
	4. Competencies to perform ash value, extractive
	values, moisture content, swelling and foaming
	index for the evaluation of crude drug

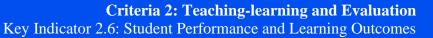
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Name of the Program and Semester	Name of the Course	Course Outcomes
B. Pharm. 5 th Semester	BP501T Medicinal Chemistry-II	 Ability to explore the disease pharmacology and its mitigation or cure Knowledge of chemical synthesis of some drugs Understanding of the structural modifications with respect to chemical classes Knowledge of the mechanism and pathways of different classes of medicinal compounds Knowledge of cancer therapeutics Ability to generate new ideas from chemistry and pharmacology for the development of possible lead
	BP502T Industrial Pharmacy-I	 Understanding of physicochemical properties of drugs as a tool in the optimization of solid and liquid dosage forms Knowledge of various considerations in development of pharmaceutical dosage forms and their manufacturing techniques Understanding of formulating solid, liquid and semisolid dosage forms and evaluate them for their quality Knowledge of the facilities and standards necessary for the industrial production of sterile dosage forms Ability to select containers, closures, and propellants for different types of aerosol systems, and evaluate appropriate packaging materials for various pharmaceutical dosage forms Competency to evaluate the pharmaceutical dosage forms for quality and stability and compare with standards prescribed in the pharmacopoeia
	BP503T Pharmacology-II	 In-depth knowledge of mechanism of drug action and its relevance in the treatment of different diseases Skills to isolate different organs/ tissues from the laboratory animals by simulated experiments Understanding of the various receptor actions using isolated tissue preparation Knowledge of the newer targets of several disease conditions for treatment Ability to describe pharmacotherapy of CVS disorders and Respiratory tract disorders

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BP504T	1. Knowledge of mechanism of drug action and its
Pharmacognosy	relevance in the treatment of different diseases
and	2. Understanding of the various receptor actions using
Phytochemistry-II	isolated tissue preparation
	3. Understanding of the relationship of pharmacology
	with related medical sciences
	4. Knowledge of the newer targets of several disease
	conditions for treatment.
	6. Ability to describe pharmacotherapy of CVS
	disorders and respiratory tract disorders
BP505T	1. Knowledge of provisions of Drugs and Cosmetics
Pharmaceutical	Act, 1940 and its rules 1945
Jurisprudence	2. Understanding of the importance of various
	regulatory procedures, pharmaceutical acts, and its
	rules with their offense and penalties
	3. Understanding of code of ethics during the
	pharmaceutical practice
	4. Knowledge of the pharmaceutical legislations in
	India and rules therein
	5. Understanding of impacts of DPCO & NLEM on
BP506P	pricing of pharmaceuticals 1. Understanding of effects of physicochemical
Industrial	properties of drugs on development of solid and
Pharmacy-I	liquid dosage forms
Practical	2. Skills to formulate and prepare tablets, capsules and
Tractical	liquid orals
	3. Knowledge of the facilities and standards necessary
	for the industrial production of sterile dosage forms
	4. Ability to prepare different types of parenteral and
	ophthalmic dosage forms, independently
	5. Skills to evaluate the pharmaceutical dosage forms
	for quality and stability and check compliance
	6. Ability to formulate cosmetic formulations
BP507P	1. Skills to visualise how to isolate different organs/
Pharmacology-II	tissues from the laboratory animals
Practical	2. Ability to imagine the effect of drugs on isolated
	organs/tissues by simulated experiments
	3. Skills to observe the effect of drugs on through
	different bioassay methods
	4. Ability to determine PA2 value, PD2 value, effect
	of spasmogens and spasmolytics, anti-
	inflammatory activity and analgesic activity

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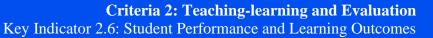
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BP508P	1. Ability to perform histological studies, powder
Pharmacognosy	characteristics, extraction and detection of crude
and	drugs
Phytochemistry-II	2. Ability to carry out isolation and detection of active
Practical	principles, independently
	3. Competencies to separate sugars by paper
	chromatography and TLC studies of plant extract
	4. Ability to carry out distillation of volatile oils and
	analysis of crude drugs by chemical tests

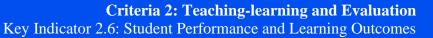
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Name of the	Name of the	Course Outcomes
Program	Course	
and		
Semester		
B. Pharm.	BP601T	1. Knowledge of the importance of the physico-
6 th Semester	Medicinal	chemical properties of drugs
	Chemistry-III	2. Understanding of the new drug design tools like
		pharmacophore modeling and docking technique
		3. Knowledge about targets in chemotherapy, microbial diseases, and anti-viral study
		4. Understanding of insights about the mechanism
		pathways of different classes of medicinal
		compounds
		5. Understanding of variety of drug classes and their
		pharmacological properties
		6. Knowledge of thrust areas of research
	BP602T	1. Understanding of mechanism of drug action and its
	Pharmacology-III	significance in the treatment of different infectious
		diseases
		2. Knowledge of the principles of toxicology and
		treatment of various poisonings conditions 3. Understanding of symptoms of poisonings and
		toxicity profile of various drugs
		4. Knowledge of the correlation of pharmacology
		with related medical sciences
	BP603T	1. Knowledge of concepts in herbal drug
	Herbal Drug	development
	Technology	2. Ability to carry out technical and management
		tasks in transforming medicinal herbs, managing
		the quality of processes, marketing of medicinal
		plants and their derivatives used in medicines and
		cosmetics
		3. Ability to recognise, collect and preserve medicinal plants
		4. Ability to analyse and herbal actives and their
		dosage forms including nutraceuticals
		5. Competency managing quality of medicinal plant
		products and derivatives as health, food and
		cosmetics products
		6. Acquittance of marketed herbal products
	BP604T	1. Understanding of the ADME properties and its
	Biopharmaceutics	significance
	and	
	Pharmacokinetics	

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BP605T Pharmaceutical Biotechnology BP606T Pharmaceutical Quality Assurance BP607P Medicinal Chemistry-III Practical	 Ability to analyze the absorption, distribution, metabolism, excretion, elimination pattern of the depending on the plasma drug concentration Ability to determine the bioavailability and bioequivalence of drug products Understanding of various pharmacokinetic parameters, their significance & applications Understanding of the basic concepts in biotechnology and research in diagnostics and therapeutics Understanding of the applications of biosensors, enzymes immobilisation, and rDNA technology in the pharmaceutical industry Knowledge of immune system and design and development of vaccines Comprehending the storage conditions and stability of biological products Knowledge of immunological tests in diagnosis Understanding of fermentation concepts to design fermenters to produce compounds of industrial significance Understanding of the cGMP, GLP and quality concept in pharmaceutical industry Knowledge of different records in industry and its importance Understanding of the responsibilities of QA & QC departments Ability to perform calibration and validation, independently Skills in various purification techniques of solvents/ liquids used in synthesis Understanding of safety measures in the laboratory Ability to synthesize and evaluate drugs and determine their physicochemical properties Ability to perform TLC, and column chromatography for the identification and
	chromatography for the identification and purification of compounds, independently 5. Understanding of the reaction mechanisms of synthesized organic compounds
BP608P Pharmacology-III Practical	 Ability to perform dose calculation in pharmacological experiments, independently Understanding of the agonist and antagonist effect of drugs

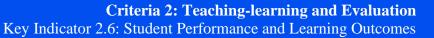
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		Ability to evaluate the toxicity aspects of drugs and related products Ability to apply biostatistics in pharmacokinetic studies
BP609P Herbal Drug Technology Practical	 3. 4. 	Understanding of herbal drugs from cultivation to herbal product development Skills to perform qualitative and quantitative evaluations of herbal crude drugs Competencies in herbal formulation development and standardization Knowledge of monograph analysis of herbal materials Knowledge of the strategies for the good manufacturing practice for Indian systems of medicine

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Name of the Program	Name of the Course	Course Outcomes
and Semester		
B. Pharm. 7th Semester	BP701T Instrumental Methods of Analysis	 Understanding of the electronic transitions in matter when energy is bombarded Knowledge of the theoretical principles and instrumentations of spectroscopic methods of analysis Knowledge of the basic principles, instrumentations and techniques involved in chromatographical techniques Competency to perform analysis of drugs using various analytical instrument
		5. Knowledge of the applications of various chromatographic techniques for organic, inorganic and natural products
	BP702T Industrial Pharmacy-II	 Knowledge of the process of pilot plant and scale up of pharmaceutical dosage forms Understanding of the process of technology transfer from lab scale to commercial batch Knowledge of different Laws and Acts that regulates pharmaceutical industry Understanding of the approval process and regulatory requirements for drug products
	BP703T Pharmacy Practice	 Knowledge of various drug distribution methods in a hospital Understanding of the pharmacy stores management and inventory control systems. Ability to monitor drug therapy of patient through medication chart review and clinical review Skills to obtain medication history interview and counsel the patients Competency identifying drug related problems and detect and assess adverse drug reactions Ability to interpret selected laboratory results of specific disease states
	BP704T Novel Drug Delivery Systems	 Knowledge of novel drug delivery systems Understanding of various approaches for development of novel drug delivery systems Knowledge of the criteria for selection of polymers in drug product development Understanding of the principles and technologies used in the design of sustained release,

Shree Warana Vibhag Shikshan Mandal's

Tatyasaheb Kore College of Pharmacy, Warananagar Tal.: Panhala, Dist.: Kolhapur, Maharashtra, India, Pin: 416 113

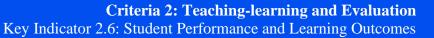
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Criteria 2: Teaching-learning and Evaluation Key Indicator 2.6: Student Performance and Learning Outcomes



		transdermal, gastroretentive, nasopulmonary and controlled release drug delivery systems Knowledge of various approaches for the development of targeted drug delivery system, ocular formulations and intra uterine devices
BP705P	1.	Ability to perform analysis of drug from different
Instrumental		dosage forms by using different spectroscopic
Methods of		techniques
Analysis	2.	Ability to carry separation and determination of
		amino acids and drugs by using chromatography
		techniques
	3.	Understanding of the instrumentation and working
		of HPLC, GC, HPTLC

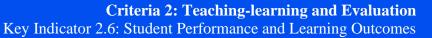
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Name of the	Name of the	Course Outcomes
Program	Course	
and Semester		
B. Pharm.	BP801T	1. Knowledge of biostatics and its applications in
8 th Semester	Biostatistics and	pharmaceutical research
	Research	2. Ability to determine type of data i.e. parametric vs
	Methodology	non-parametric, paired vs non-paired etc.
		3. Understanding of basic concepts in statistics
		including probability, regression, correlation, DoE,
		optimization, test of significance etc. 4. Competency selecting suitable statistical tools/
		tests for our own research data
		5. Skills using various software used in optimization
		and statistical analysis of data
		6. Understanding of research methodology, and
		research designs 7. Competency of report writing and presentation of
		research outcomes
	BP802T	1. Knowledge about the measures to control and
	Social and	prevent spread of diseases and ability applying it
	Preventive	further to avoid spread of the disease
	Pharmacy	2. Understanding of the different types of national
		health programs and their objectives and ability to create aware ness in society
		3. Understanding of the importance of community
		services
		4. Competency to analyse social health problems and
	DD002FF	to contribute in public health
	BP803ET Pharma Marketing	1. Understanding of basic concepts of pharma
	Management	marketing management, types of pharmaceutical markets
		2. Knowledge of the pharmaceutical product
		management and product decision
		3. Understanding of pharmaceutical product
		promotion 4. Knowledge of phormacoutical marketing channels
		4. Knowledge of pharmaceutical marketing channels and roles and responsibilities of professional sales
		representative
		5. Understanding of pricing strategies and laws
		related to the pricing of pharmaceutical products in
		India Average of amorping concepts in montrating
		6. Awareness of emerging concepts in marketing

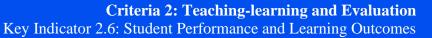
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BP804ET	1. Knowledge of the regulatory requirements for
Pharmaceutical	approval of new drug/ drug product in regulated,
Regulatory	semi-regulated, domestic market and ROW
Science	2. Understanding of the process of drug discovery
	and development
	3. Knowledge of the regulatory authorities and
	agencies governing the manufacture and sale of
	pharmaceuticals
	4. Understanding of the regulatory approval process
	and their registration in Indian and international
	markets
BP805T	1. Understanding of the meaning, scope and
Pharmacovigilance	importance of pharmacovigilance
T marmaco vignamee	2. Knowledge of detection, assessment, reporting of
	new adverse drug reactions
	3. Information about PvPI and guidelines related to
	ADR reporting
	4. Comprehending methods of safety data during pre-
	clinical, clinical and post approval phases of drugs'
	life cycle
	5. Ability to write case narratives of adverse events
	and their quality
BP806ET	Knowledge of WHO guidelines for quality control
Quality Control	of herbal drugs
and	
Standardization of	2. Understanding of concepts in quality assurance of herbal drug products
Herbals	
11010018	3. Information about regulatory approvals of herbal products in India and abroad
	4. Understanding of EU and ICH guidelines relevant
	to herbal drug industry
BP 807 ET	
Computer Aided	1. Understanding of the design and discovery process of lead molecules
1	
Drug Design	2. Knowledge of the classification of drug design
	tools for drug discovery process
	3. Understanding of various strategies to develop
	drug like molecules
	4. Knowledge of various molecular modelling
DDOCOUT	software to design new drug molecule
BP808ET	1. Understanding of the cell as chemical industry
Cell and Molecular	2. Knowledge of structure and functions of cell
Biology	organelles, DNA/ RNA proteins
	3. Understanding of basic molecular genetics mechanisms

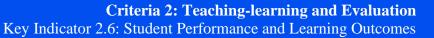
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	4.	Understanding of the cell signalling pathways with
		their regulations and role in disease progress
RI	P809ET 1.	Knowledge of basics of cosmetics and
	etic Science	cosmeceutical products
	2.	Understanding of principles of formulation and
	3	building blocks of skin and hair care products Knowledge of evaluation of cosmetic products
		Knowledge of skin and hair associated problems
		and role of cosmeceuticals in treating those
		Knowledge of routinely used laboratory animals Understanding of various screening methods used
	ing Methods	in preclinical research
	3.	$\boldsymbol{\varepsilon}$
		methodology in preclinical investigations of drug and drug products
	5.	
	dvanced umentation 2.	pharmaceutical industry Knowledge of chromatographical techniques
	chniques	employed in pharmaceuticals
	3.	Understanding of thermal methods of drug analysis
	4.	Ability to do calibration and validation of various analytical instruments, independently
	5.	Knowledge of the advanced instruments used and
RI	P812ET 1.	its applications in drug analysis Understanding of the need of supplements by the
	Dietary 1.	different group of people to maintain healthy life
Suppl	lements and 2.	Understanding of the outcome of deficiencies in
Nutr	raceuticals	dietary supplements Recognizing the components in dietary
	3.	supplements and their applications
	4.	Information about the regulatory and commercial
		aspects of dietary supplements including health claims

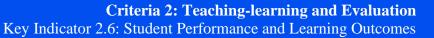
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Name of the Program and Semester	Name of the Course	Course Outcomes
M. Pharm. Pharmaceutics 1st Semester	MPH101T Modern Pharmaceutical Analytical Techniques	 Knowledge of theories and principles of advanced analytical instrumental techniques Ability to apply knowledge and technical skills of instrumental operations for the identification, characterization, and quantification of drugs and excipients Ability to do the quantitative analysis of various drugs in single and combination dosage forms Capability to compile, organise, communicate, and defend information on concepts in pharmaceutical quality assurance
	MPH102T Drug Delivery Systems	 Knowledge of different types of drug carriers and drug delivery systems Understanding of the criteria for selection of excipients and polymers for the development of drug delivery systems Knowledge about drug supply chain Ability to design and develop personalized drug delivery systems Skills developing and evaluating drug delivery systems to serve to improve efficacy and safety Knowledge about approaches of delivering biologics
	MPH103T Modern Pharmaceutics	 Comprehending the concept and significance of preformulation studies Knowledge of physics of tablet making Competency to use optimization techniques in formulation development Understanding of sterility and stability testing Knowledge of packaging of pharmaceuticals Knowledge of validation, its importance, types and its regulatory requirements Understanding of the significance of cGMP Realizing the significance of materials and process management in pharmaceutical manufacturing

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	MPH104T	1.	Understanding of the concents of different
		1.	Understanding of the concepts of different
	Regulatory Affairs	_	types drug product developments
		2.	Knowledge of regulatory guidance and
			guidelines globally
		3.	Understanding of dossier development and
			submissions in regulated, semi-regulated
			market and rest of world (ROW)
		4.	Knowledge about how phase III & IV clinical
			trials are conducted
		5.	Ability to do CTD/ eCTD submissions
		6.	Understanding of post approval submissions
	MPH105P	1.	Skill to evaluate pharmaceuticals using
	Pharmaceutics		spectroscopic and chromatographical
	Practical-I		techniques
	Tractical 1	2.	Competency to formulate and evaluate
		2.	sustained-release matrix tablets, transdermal
			patches
		3.	Competency to study <i>in vitro</i> dissolution of
		٥.	sustained and controlled release formulations
		4	
		4.	Understanding about physical pharmaceutics
		_	concepts involved in dissolution of OSDs
		5.	Knowledge of preformulation aspects and
15.71) (DYY0.1 II		drug release mechanisms of tablets
M. Pharm.	MPH201T	1.	Understanding of the science of drug targeting
Pharmaceutics	Molecular	2.	Knowledge of different drug targeting
2 nd	Pharmaceutics		approaches
Semester		3.	Understanding of various targeting strategies
			including nanoparticles, liposomes,
			microspheres
		4.	Ability to formulate and evaluate various
			particulate systems including nanoparticles,
			liposomes, microspheres, phytosomes,
			electrosomes etc.
	MPH202T	1.	Understanding of mechanisms of drug
	Advanced		absorption and factors influencing
	Biopharmaceutics	2.	Realizing importance of dissolution testing
	and		and the concept of IVIVC
	Pharmacokinetics	3.	Understanding of compartmental and non-
			compartment models in PK studies
		4.	Knowledge of dosage regimens and PK/PD
			behaviour of the drug
		5.	Knowledge of drug interactions affecting the
			PK of drugs
			111 01 111120

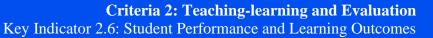
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	6. Understanding of the concept of BA/ BE in new drug or dosage form developments
MPH203T	1. Knowledge of use of computers in
Computer-aided	pharmaceutical development
Drug Delivery	2. Understanding of use of statistics,
	optimization techniques and QbD in pharmaceutical research and development
	3. Comprehending the concept of computational fluid dynamics (CFD)
	4. Knowledge about computational modeling of
	drug disposition and transporters
	5. Understanding impact and applications of AI, automation and robotics in pharma industry
	7. Knowledge of computer aided
	biopharmaceutical characterizations
MPH204T	1. Understanding of basic science of developing
Cosmetics and	cosmetics and cosmeceuticals
Cosmeceuticals	2. Realizing regulatory requirements for
	obtaining license to manufacture and sale of
	cosmetics
	3. Knowledge of scientific approach to develop cosmetics and cosmeceuticals with desired
	safety, stability and efficacy
	4. Understanding of current technologies
	involved in developing cosmetics and
	cosmeceuticals
	5. Information of guidelines in development of
	herbal cosmetics
MPH 205P	1. Know-how of designing, formulating and
Pharmaceutics	evaluating micro and nanoparticle
Practical-II	formulations
	2. Ability to analyse and correlate the <i>in vitro</i>
	and <i>in vivo</i> performance of pharmaceuticals 3. Ability of using QbD and statistical tools in
	design and development of pharmaceutical
	products
	4. Ability to develop cosmetic products by
	proper selection of excipients
	5. Skills to use design expert and other software
	in pharmaceutical development
	6. Knowledge of computational simulation
	techniques in PK/ PD studies

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Name of the Program and Semester	Name of the Course	Course Outcomes
M. Pharm. Pharmaceutical Quality Assurance 1st Semester	MQA101T Modern Pharmaceutical and Analytical Techniques MQA102T Quality Management System	 Knowledge of theories and principles of advanced analytical instrumental techniques Ability to apply knowledge and technical skills of instrumental operations for the identification, characterization, and quantification of drugs and excipients Ability to do the quantitative analysis of various drugs in single and combination dosage forms Capability to compile, organise, communicate, and defend information on concepts in pharmaceutical quality assurance Understanding the importance of quality and QMS Recognizing ISO and its importance in quality management Ability to apply their understanding about tools for quality improvement, resolve threats to quality of pharmaceuticals Skills evaluating pharmaceuticals for their safety, efficacy and hence for identity, strength and purity Ability to carry stability testing of drug substances and pharmaceuticals Competency using statistical concepts in pharmaceutical quality systems
	MQA103T Quality Control and Quality Assurance	 Knowledge of cGMP and its importance in pharmaceutical industry Understanding of importance of documentation Knowing the scope of quality certifications in pharmaceutical industries Ability to work competently as QA executive
	MQA104T Product Development and Technology Transfer	 Understanding about the science of new product development Ability to do preformulation studies, pilot scale up and selection of suitable pharmaceutical packaging

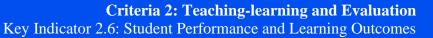
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		2	
	Modulos	3.4.	Competency in transferring the technology from R&D to pilot and then to manufacturing scale Knowledge of regulatory aspects of technology transfer in the pharmaceutical industry
	MQA105P Quality Assurance Practical-I	 1. 2. 3. 4. 	Ability to analyze the excipients, API, and formulations Ability to resolve the quality related issues in pharmaceutical development and manufacturing Skill and knowledge to perform the preformulation studies efficiently Understanding of importance of solubility in development of dosage forms
M. Pharm. Pharmaceutical Quality Assurance 2 nd Semester	MQA201T Hazards and Safety Management	 2. 3. 	Understanding role of environmental and ecosystem and its impact on industrial processes Knowledge about types of hazards
	MQA202T Pharmaceutical Validation	 2. 3. 4. 	Knowledge of concepts in calibration, qualification and validation in pharmaceutical industry Ability to do qualification of equipment and instruments Competency to perform process/ cleaning/ analytical method validation Knowledge of process of utility and electronic system validation
	MQA204T Pharmaceutical Manufacturing Technology	 1. 2. 3. 4. 	Understanding of development of pharmaceuticals Ability to design plant layout and do production planning Understanding of aseptic process technology, process automation and lyophilization, and advanced sterile manufacturing technologies Know-how of basic and advanced technologies manufacturing of non-sterile pharmaceutical products

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	5. Ability to test quality of pharmaceutical containers and closures6. Knowledge about QbD and PAT
MQA205P Quality Assurance Practical-II	 Ability to analyse impurity and contaminants in pharmaceuticals Competency to do qualifications of instruments and processes in pharmaceutical industry Ability to design layout of pharmaceutical industry Ability to use quality tools for effective quality assurance and improvement of pharmaceuticals
MPA203T Audits and Regulatory Compliances	 Knowledge of auditing in the pharmaceutical industry Ability to participate in the audit process of various departments Skills to prepare audit reports Ability to design and prepare the checklists for the auditing Ability to compile, organise, communicate, and defend information on pharmaceutical quality assurance

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Criteria 2: Teaching-learning and Evaluation Key Indicator 2.6: Student Performance and Learning Outcomes



Name of the	Name of the	Course Outcomes
Program and	Course	
Semester		
M. Pharm.	MRM301T	1. Ability to identify research problems
Pharmaceutics	Research	2. Understanding of steps to follow selection of
&	Methodology and	suitable statistical tests for the analysis of
Pharmaceutical	Biostatics	research data
Quality		3. Empowered to follow ethics in medical
Assurance		research including clinical research
3 rd Semester		4. Ability to handle and take care of
		experimental animals in most human way
		and efficiently carry animal studies
		5. Understanding how to follow regulations in
		medical research