# Teerthanker Mahaveer University College of Pharmacy

## **B.Pharm. (Bachelor of Pharmacy)**

### Programme Outcome

PO-1	:	Acquiring and retrieve sound knowledge on fundamental principles and their applications in the area of Pharmaceutical Sciences and Technology.
PO-2	:	Understanding and communicate the value of pharmacist's professional roles in society
		employees).
PO-3	:	Understanding the environmental, economic and societal impact of pharmacy.
PO-4	:	Developing ability for in-depth analytical and critical thinking in order to identify,
		formulate and solve the issues related to Pharmaceutical Industry, Regulatory
		Agencies, Hospital & Community Pharmacy.
PO-5	:	Developing written and oral communication skills.
PO-6	:	Developing creativity to solve need based problems in pharmaceutical Industry.
PO-7	:	Developing professional ethics, entrepreneurship, leadership and team spirit.

#### Programme Specific Outcome

PSO-1	:	Understanding the basic concepts of homeostasis, disease etiology and their
		management with drugs and pharmaceuticals
PSO-2	:	Understanding the various concepts of development of drug and pharmaceuticals
PSO-3	:	Understanding the marketing concepts and management techniques for regulating
		and distributing drug and pharmaceuticals
PSO-4	:	Understanding the basic concepts of quality assurance in pharmaceutical
		manufacturing, distribution and warehousing.
PSO-5	:	Understanding and demonstrating knowledge of regulatory guidelines pertaining to
		export and import of drugs
PSO-6	:	Describing various requirements and methodology used for manufacturing and quality
		control of various pharmaceutical and cosmetic product
PSO-7	:	Demonstrating use of various instruments and equipment with their standard
		operating procedures (SOPs) for the analysis of drugs and pharmaceuticals
PSO-8	:	Promoting safe and rational use of medicines

### **Course Outcomes**

BPHT102	CO-1	Understanding the principles of volumetric and electro chemical analysis.
	CO-2	Applying various volumetric and electrochemical titrations.
	CO-3	Analyzing drugs and pharmaceuticals.
	CO-4	Evaluating given samples with respect to official standards.
BPHT101	CO-1	Understanding the gross morphology, structure and functions of various
		organs of the human body
	CO-2	Applying the knowledge in performing various experiments related to

		different system of human body.
	CO-3	Analysing various pathological conditions of human body.
BPHT103	CO-1	Understanding the history of profession of pharmacy.
	CO-2	Demonstrating the basics of different dosage forms.
	CO-3	Illustrating various dosage forms.
BPHT104	CO-1	Understanding medicinal and pharmaceutical importance of inorganic
		compounds.
	CO-2	Demonstrating properties and methods of preparation of inorganic
		pharmaceutical drugs.
	CO-3	Analyzing sources and methods to determine the impurities inorganic
		compounds.
BPHT105	CO-1	Understanding the principles and process of communication.
	CO-2	Recognizing the barriers of communication.
	CO-3	Analysing the verbal and non-verbal communication.
	CO-4	Developing interpersonal skills, oral and written communication skills.
BPMT106	CO-1	Understanding the basic concepts of mathematical theory, formulas and
		their applications in Pharmacy.
	CO-2	Demonstrating the important application of Mathematics in Pharmacy.
	CO-3	Applying formulas to solve the different types of pharmaceutical
		calculations.
BPBT106	CO-1	Understanding classification and salient features of plant and animal
		kingdoms.
	CO-2	Describing the anatomy & physiology of plants.
	CO-3	Demonstrating the anatomy & physiology of animals with reference to
		numans.
BPHP 151	CO-1	Understanding the anatomy and physiology of different systems of our
	<u> </u>	bouy. Evalaining homoostatic mechanisms in human hody along with structure
	CO-2	and functions of tissues and organs
	CO-3	Demonstrating various experimental techniques in determining
	CO-3	physiological conditions of the body
BPHP 152	CO-1	Demonstrating the preparation and standardisation of some compounds.
	CO-2	Illustrating the assay of compounds and standardisation of titrant.
	CO-3	Analyzing the limit test and normality by electroanalytical methods.
BPHP 153	CO-1	Understanding use of ingredients in pharmaceutical formulation
		development.
	CO-2	Formulating various conventional dosage forms.
	CO-3	Evaluating various pharmaceutical formulations for its quality and
		effectiveness.
BPHP154	CO-1	Identifying the sources of impurities and methods to determine the
		impurities inorganic compounds.
	CO-2	Formulating different inorganic pharmaceuticals.
	CO-3	Evaluating physic-chemical properties of various inorganic compounds.
BPHP155	CO-1	Understanding the basics of communication skills.
	CO-2	Applying oral and written communication skills with proper pronunciation
		and presentation.
BPBT156	CO-1	Demonstrating microscopic structure of cells and tissues of both plant

		and animals.
	CO-2	Analyzing various physiological conditions of human such as blood group,
		blood pressure & tidal volume, etc.
BPHT201	CO-1	Understanding the structure and functions of various organs of the
		human body.
	CO-2	Explaining various homeostatic mechanisms and their imbalances in
		human body.
	CO-3	Identifying the interlinked mechanisms of homeostasis in human body.
	CO-4	Analysing the haematological tests and vital signs and symptoms.
BPHT 202	CO-1	Understanding nomenclature, structure, name and the type of isomerism
		of organic compounds.
	CO-2	Explaining orientation of reactions, reactivity/stability and preparation of
		organic compounds.
	CO-3	Identifying and confirm the organic compounds.
BPHT203	CO-1	Understanding the catalytic role of enzymes, importance of enzyme
		inhibitors in design of new drugs, therapeutic and diagnostic applications
		of enzymes.
	CO-2	Describing the metabolism of nutrient molecules in physiological and
		pathological conditions.
	CO-3	Explaining the genetic organization of mammalian genome and functions
	<u> </u>	of DNA in the synthesis of RNAs and proteins.
BPH1204	0-1	conditions
	<u> </u>	Understanding concents, principles of pathenbysiology and identifying
	0-2	responses related to nathonhysiologic processes results in disease
	<b>CO-3</b>	Analysing the complications of the diseases
BPHT 205	CO-1	Understanding application of computers in pharmacy.
	CO-2	Recognising concept of information system, software and bioinformatics.
	CO-3	Applying computers for data analysis in preclinical development.
BPHT206	CO-1	Understanding concepts & sources of environment and its associated
		problems and measures to control.
	CO-2	Describing the ecosystems.
	CO-3	Analysing human impacts on the environment.
BPHP 251	CO-1	Understanding gross morphology, structure and functions of various
		organs of the human body.
	CO-2	Demonstrating function of various organs and systems of human body
		with appropriate models
	CO-3	Analysing various physiological parameters of body fluids
	CO-4	Determining presence of elements and functional groups in organic
		compounds
	CO-5	Analyzing organic compounds qualitatively
	CO-6	Constructing molecular models
	CO-7	Synthesizing organic compounds
врнр253С	<u> </u>	Determining blood and urine components qualitatively and quantitatively.
	0-2	fluide
	CO 1	Indus.
DEITEZ34	00-1	onderstanding basic concepts of fitting and its use in creating websites.

	CO-2	Demonstrating the information of any drug and its adverse effects using
		online tools.
	CO-3	Deploying MS Office tools to store and retrieve patient information from
		the Database.
	CO-4	Generating and printing report from patient database.
BPHT301	CO-1	Understanding the mechanism of a chemical reaction and isomerism of
		organic Compounds.
	CO-2	Explaining the orientation and name of a chemical reaction.
	CO-3	Demonstrating preparation, reactivity and stability of organic compounds.
BPHT302	CO-1	Understanding various physicochemical properties of drug molecules in
		designing the dosage forms.
	CO-2	Identifying various physicochemical properties of a drug molecule.
	CO-3	Demonstrating the use of various physicochemical parameters of a drug
		molecule to develop a stable formulation.
BPHT303	CO-1	Understanding various methods of identification, cultivation and
		preservation of microorganisms.
	CO-2	Describing various methods of sterilization and sterility testing for
		pharmaceutical Products.
	CO-3	Recognizing concept of cell culture technology and its applications in
		pharmaceutical industries.
	CO-4	Analyzing microbiological standardization of pharmaceuticals.
BPHT304	CO-1	Understanding various unit operation and material handling techniques
		used in pharmaceutical industries.
	CO-2	Recognising the appropriate materials for pharmaceutical plant
		construction.
	CO-3	Understanding and demonstrating steps in various processes involved in
	<u> </u>	pharmaceutical manufacturing.
	CO-4	Applying various methods for prevention of corrosion of materials used in
	<u> </u>	pharmaceutical plant construction.
DPHP351	0-1	explaining various laboratory techniques involved in synthesis of organic
	<u> </u>	Standardizing oils and reagents
	CO-2	Supthosizing organic compounds
		Understanding various physicochemical properties of a drug molecule
DELLESSE	$\frac{0}{1}$	Determining various physicochemical properties of a drug molecule to
	CO-2	be utilized for developing a stable formulation
<b>BDHD353</b>	CO-1	Demonstrating operation of various equipment and processes used in
	001	experimental microbiology.
	CO-2	Practicing various microbiological assays as well as sterility tests for
		pharmaceuticals.
BPHP354	CO-1	Understanding various unit operation and material handling techniques
		used in pharmaceutical industries.
	CO-2	Demonstrating various processes involved in pharmaceutical
		manufacturing.
	CO-3	Analyzing various parameters of unit operation process.
BPHT401 P	CO-1	Understanding the methods of preparation and properties of organic
		compounds.

	CO-2	Explaining stereo chemical aspects and reactions of organic compounds.
	CO-3	Demonstrating medicinal use and other application of organic
		compounds.
BPHT402	CO-1	Understanding the chemistry of drugs, their pharmacological activities,
		metabolic pathways, adverse effect and therapeutic values.
	CO-2	Demonstrating the structure activity relationship (SAR) of different classes
		of drugs.
	CO-3	Illustrating the chemical synthesis of some drugs.
BPHT403T	CO-1	Understanding different physiochemical characteristics of drug molecules
		in dosage form designing.
	CO-2	Explaining reaction kinetics in relation to stability of drugs and dosage
		forms.
	CO-3	Demonstrating use of physicochemical properties in the formulation
		development and evaluation of dosage forms.
ВРНТ404	CO-1	Understanding the pharmacological actions of different categories of
	<u> </u>	Grugs.
	CO-2	explaining mechanism of drug action at organ / subceilular /
	<u> </u>	Illustrating offect of drugs on animal models
	CO-4	Applying pharmacological knowledge in prevention and treatment of
	CO-4	
ВРНТ405Т	CO-1	Understanding the techniques in the cultivation and production of crude
51114051	0-1	drugs
	CO-2	Describing the crude drugs, their uses and chemical nature
	CO-3	Illustrating the evaluation techniques for the herbal drugs.
	CO-4	Analysing the microscopic and morphological evaluation of crude drugs.
BPHP451T	CO-1	Recognizing various mechanisms for synthesis of drugs or their
		intermediates.
	CO-2	Explaining the principal involved in assay of drugs in dosage forms.
	CO-3	Illustrating different physico-chemical properties of various classes of
		drug.
BPHP452P	CO-1	Understanding role of different physiochemical parameters in dosage
		form designing.
	CO-2	Determining various physiochemical parameters of drug and excipients
		using various instrumental techniques.
BPHP453P	CO-1	Understanding the use of instruments and techniques in experimental
		pharmacology.
	CO-2	Demonstrating the different routes of drug administration on animal
		models.
	CO-3	Analyzing drug actions using simulated experiments on animal
		models.
BPHP454	CO-1	Illustrating various physic-chemical parameters of crude drugs through
		cnemical tests and microscopical examination.
	10-2	Analysing various physic-chemical parameters of crude drugs for its
		Stanuardization.
BRHISUI	10-1	pharmacological activity
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	CO-2	Explaining drug metabolic pathways, adverse effects and therapeutic
		values of drugs.
	CO-3	Describing structural Activity Relationship of different class of drugs.
	CO-4	Demonstrating synthesis of selected drugs.
BPHT502	CO-1	Understanding concepts and factors in development of pharmaceutical
		dosage forms.
	CO-2	Describing various pharmaceutical dosage forms and their manufacturing
		techniques.
	CO-3	Illustrating formulation of solid, liquid and semisolid dosage forms.
	CO-4	Evaluating different dosage forms for its quality and stability.
BPHT503	CO-1	Understanding the mechanism of drug actions in relevance to its
		therapeutic use.
	CO-2	Illustrating drug's action in isolated tissues or organs using simulated
		animal model.
	CO-3	Demonstrating various receptor mediated actions using isolated tissue
		preparations.
	CO-4	Analyzing correlation of pharmacology with related medical sciences.
BPHT504	CO-1	Understanding modern extraction techniques, isolation, characterization
		and identification of the herbal drugs and its phytoconstituents.
	CO-2	Demonstrating the preparation and development of herbal formulations.
	CO-3	Interpreting herbal drug interactions.
	CO-4	Analysing isolated phytoconstituents for its chemical nature and
		structural Configuration.
BPHT505	CO-1	Understanding the pharmaceutical legislations and their implications in
		the development and marketing of pharmaceuticals.
	CO-2	Recognizing various regulatory authorities and agencies governing the
	<u> </u>	manufacture and sale of pharmaceuticals.
	CO-3	Demonstrating various Acts and Laws pertaining to manufacturing, sale
	<u> </u>	Applying the code of othics during the pharmacoutical practice
	CO-4	Applying the code of ethics during the pharmaceutical practice.
DEULOSI	0-1	of formulation ingredients
	CO-2	Stating the functioning of various equipments used for liquid solid and
		semisolid dosage form formulations
	CO-3	Formulating various dosage forms.
	CO-4	Evaluating various dosage forms for its quality and efficacy.
BPHP552	CO-1	Demonstrating drug effects using computer model.
	CO-2	Estimating biochemical parameters in body fluids.
	CO-3	Experimenting on isolated tissue preparation and in vivo studies.
	CO-4	Analysing various receptor site interactions using isolated tissue
		preparations.
BPHP553	CO-1	Examining phytoconstituents belongs to different chemical groups.
	CO-2	Analysing crude drugs by chemical tests.
	CO-3	Evaluating and characterizing crude drugs belongs to various chemical
		class.
BPHT601	CO-1	Understanding the chemistry of drugs with respect to their
		pharmacological activity.

	CO-2	Explaining the importance of drug design and different techniques of drug
		design.
	CO-3	Describing structural Activity Relationship of different classes of drug.
	CO-4	Demonstrating the drug metabolic pathways, adverse effect and
		therapeutic value of drugs.
BPHT602	CO-1	Understanding the mechanism of drug actions in relevance to its
		therapeutic use.
	CO-2	Recognizing the principles of toxicology and treatment of poisoning.
	CO-3	Analyzing correlation of pharmacology with related medical sciences.
BPHT603	CO-1	Understanding raw material as source of herbal drugs from cultivation to
		herbal drug product.
	CO-2	Explaining the WHO and ICH guidelines for evaluation of herbal drugs.
	CO-3	Recognising the herbal cosmetics, natural sweeteners, nutraceuticals.
	CO-4	Illustrating patenting of herbal formulations.
BPHT604	CO-1	Understanding basic concepts in biopharmaceutics and pharmacokinetics
		and their significance.
	CO-2	Describing the concepts of bioavailability and bioequivalence of drug
		products and their significance.
	CO-3	Applying pharmacokinetic parameters in calculation and fixation of
		dosage regimen.
	CO-4	Analysing plasma drug concentration versus time data to calculate
		pharmacokinetic parameters and profiles of drug/formulations.
BPHT605	CO-1	Understanding basic concepts of biotechnology and its application in
		pharmaceutical industries.
	CO-2	Demonstrating genetic engineering applications in relation to production
	<u> </u>	of pharmaceuticals.
	CO-3	Explaining the production/processing and storage of some of the
	<u> </u>	Employing the use of microorganisms in formontation technology
	CO-4	Linderstanding the sCMP aspects scene of quality sertifications
DPHIOUO	0-1	applicable to pharmaceutical industries
	<u> </u>	Explaining the responsibilities of OA & OC departments and regulatory
	0-2	aspects of pharmaceuticals
BDHD651	CO-1	Illustrating structures and its activity using chem draw <sup>®</sup>
Di in 051	CO-2	Determining physiochemical properties of drugs using drug design
		software
	CO-3	Analysing drugs and their intermediates through assay
	CO-4	Synthesizing drugs and their intermediates
BPHP652	CO-1	Interpreting the relationship between dosage calculation and activity of
51111 052		the drug.
	CO-2	Applying the biostatistical methods in experimental pharmacology
	CO-3	Analysing drugs through bioassays.
	CO-4	Evaluating the toxic effects of drug on animal tissues.
BPHP653	CO-1	Demonstrating toxicity studies of herbal drugs on animal models.
	CO-2	Analyzing herbal formulations to comply pharmacopoeial standard
	CO-3	Formulating different herbal solid, semisolid and liquid dosages forms
BPHT701	CO-1	Understanding the interaction of matters with electromagnetic radiations
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		and its application in drug analysis.
	CO-2	Understanding the chromatographic separation and analysis of drugs.
	CO-3	Performing quantitative & qualitative analysis of drugs using various
		analytical instruments.
BPHT702	CO-1	Understanding the process of pilot plant and scale up techniques for
		pharmaceutical dosage forms.
	CO-2	Describing the process of technology transfer from lab scale to
		commercial batch.
	CO-3	Demonstrating regulatory requirements for drug approval and clinical
		studies.
BPHT703	CO-1	Understanding the management of hospital, hospital pharmacy and
		community pharmacy, inventory control & drug distribution system.
	CO-2	Identifying drug related problems, adverse drug reactions and monitoring
		drug therapy of patient by interpreting laboratory results and clinical
		review.
	CO-3	Practicing medication history interview, patient counselling and
		promoting rational drug use.
BPHT704	CO-1	Understanding various approaches in development of novel drug delivery
		systems.
	CO-2	Defining the criteria for selection of drugs and polymers for development
		of novel drug delivery systems.
	CO-3	Formulating various novel drug delivery systems.
	CO-4	Evaluating various novel drug delivery systems.
BPHP751	CO-1	Understanding operational principles of different analytical instruments
	CO-2	Analyzing drugs quantitatively and qualitatively with different
	<u> </u>	Instrumental techniques.
	CO-3	Assessing drug formulations with reference to pharmacopoeial
	<u> </u>	Industanding the working of any one of the following departments
DFHF752	0-1	through experiential learning
		Pharmaceutical Industry/Hospital
		Production unit
		Quality Control department
		Quality Assurance department
		Analytical laboratory
		Chemical manufacturing unit
		Pharmaceutical R&D
		• Hospital (Clinical Pharmacy)
		Clinical Research Organization
		Community Pharmacy
BPHT801	CO-1	Understanding various statistical techniques to solve statistical problems
	CO-2	Recognizing the operation of M.S. Excel, SPSS, R and MINITAB®, DoE
		(Design of Experiment).
	CO-3	Applying statistical techniques in solving the problems.
BPHT802	CO-1	Understanding current issues related to health and pharmaceutical
		problems within the country and worldwide.
	CO-2	Recognizing current healthcare development programs including national

		health policies WHO (World Health Organisation) & programmes and role
		of
	CO-3	Demonstrating prevention and control of communicable and non-
		communicable Diseases.
	CO-4	Evaluating alternative ways of solving problems related to health and
		pharmaceutical issues.
BPHT803	CO-1	Understanding marketing concepts and techniques used pharmaceutical
		industry.
	CO-2	Applying marketing concepts and techniques for pharmaceutical product
		decision, promotion and pricing.
BPHT804	CO-1	Understanding the process of drug discovery and development.
	CO-2	Recognizing regulatory authorities and agencies governing the
		manufacturing, sales and distribution of pharmaceutical products.
	CO-3	Demonstrating regulatory approval process their registration in Indian
		and international markets.
BPHT805	CO-1	Understanding drug safety concepts, history, development and national /
		international scenarios of pharmacovigilance.
	CO-2	Practicing pharmacovigliance as per ICH guidelines in detection,
	<u> </u>	Assessment and reporting of ADRs.
	CO-3	Analysing and reporting new adverse drug reactions.
	CO-4	mothers.
BPHT806	CO-1	Understanding WHO, ICH and EU guidelines for qualitycontrol of herbal
		drugs and concept of quality assurance in herbal drug industry.
	CO-2	Demonstrating regulatory requirements and approval process for herbal
		drug registration in Indian and international markets.
BPHT807	CO-1	Understanding the role of drug design and discovery of lead molecule in
		drug discovery process.
	CO-2	Recognizing the concept of QSAR, molecular docking and various
	<u> </u>	strategies to develop new drug like molecule.
	0-3	software.
BPHT808	CO-1	Understanding cell and molecular biology history, cellular structure its
		functioning, DNA properties and chemical foundation of cell biology.
	CO-2	Describing protein structure and its function, cellular membrane structure
		and function and basic molecular genetic mechanisms.
<b>BPHT809</b>	CO-1	Understanding concepts of cosmetics and cosmeceuticals.
	CO-2	Describing basic requirements for formulation and development of skin
		care, hair care, oral and dental care cosmetic products.
	CO-3	Discussing role of herbs in cosmetics analytical methods for shampoo,
		skin cream and toothpaste.
	CO-4	Illustrating principles of cosmetic evaluation.
BPHT810	CO-1	Recognising the applications of various commonly used laboratory
		animals.
	CO-2	Demonstrating various screening models used in preclinical research and
		Importance of biostatistics and research methodology.
	CO-3	Designing and executing a research hypothesis independently.

	CO_1	Understanding the fundamental working principles and its application of
DEILIOIT	CO-1	Onderstanding the fundamental working principles and its application of
		some advanced analytical instruments used in drug analysis.
	CO-2	Describing the principles of chromatographic separation and analysis of
		drugs.
	CO-3	Recognizing the calibration of various analytical instruments.
	CO-4	Reviewing analysis of drugs using various analytical instruments
BPHT812	CO-1	Understanding the need of dietary supplements by the different group of
		people to maintain healthy life.
	CO-2	Explaining the outcome of deficiencies in dietary supplements.
	CO-3	Identifying the components in dietary supplements and their application.
	CO-4	Recognizing the regulatory and commercial aspects of dietary
		supplements including health claims.
BPHT813	CO-1	Understanding the objectives of pharmaceutical product development.
	CO-2	Explaining the different properties of pharmaceutical excipients.
	CO-3	Designing a pharmaceutical product by QbD.