School of Pharmacy and Research, People's University

B.PHARM (Course Outcome)

Year	Subject	Outcome	Program Outcome
I year	**BP101T. HUMAN ANATOMY AND PHYSIOLOGY-I CO1**	CO1 Imparts fundamental knowledge on the structure and functions of the various systems of the human body. CO2 Helps in understanding both homeostatic mechanisms. CO3 Provides the basic knowledge required to understand the various disciplines of pharmacy. CO4 Helpful for developing an insight on the subject.	PO1, PO6
	BP102T. PHARMACEUTICAL ANALYSIS CO3	CO1 Deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs including their principles, titrations and analytical skills. CO2. Understand the basic components of anatomy physiology of plant & physiology animal with special reference to human.	PO1, PO2, PO6
	BP103T. PHARMACEUTICS-I CO3	CO1 Imparts a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms. CO2. Pharmaceutical calculations and Preparation of various conventional dosage forms.	PO1,PO3, PO6, PO12
	BP104T. PHARMACEUTICAL INORGANIC CHEMISTRY CO4	CO1 Deals with the monographs of inorganic drugs and pharmaceuticals. CO2.Understands the medicinal and pharmaceutical importance of inorganic compounds drugs and pharmaceuticals.	PO1, PO6
	BP105T.COMMUNICATION SKILLS CO5	CO1 Prepares the young pharmacy student to interact effectively with doctors, nurses,	PO9,PO10

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		dentists, physiotherapists and other health workers. CO2 Student gets the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.	
	BP 106RBT.REMEDIAL BIOLOGY **CO6**	CO1 Understand the components of living world, structure and functional system of plant and animal kingdom. CO2 Understand the salient features of the kingdoms of life.	PO1
	BP 106RMT.REMEDIAL MATHEMATICS **CO7**	CO1 Deals with the introduction to Partial fraction, Logarithm. matrices and Determinant. CO2 Analytical geometry, Calculus, differential equation and Laplace transform.	PO1
	BP 201T. HUMAN ANATOMY AND PHYSIOLOGY-II **CO8**	CO1 Imparts fundamental knowledge on the structure and functions of the various systems of the human body. CO2 Helps in understanding both homeostatic mechanisms. CO3 Provides the basic knowledge required to understand the various disciplines of pharmacy.	PO1, PO6
	BP202T. PHARMACEUTICAL ORGANIC CHEMISTRY –I **CO9**	CO1 Deals with classification and nomenclature of simple organic compounds, structural isomerism, intermediates forming in reactions. CO2 It also deals with important physical properties, reactions and methods of preparation of these compounds. CO3 Emphasizes on mechanisms and orientation of reactions.	PO4, PO6
	BP203 T. BIOCHEMISTRY **CO10**	CO1 Deals with complete understanding of the molecular	PO1, PO6

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		levels of the chemical process associated with living cells. CO2 Provides biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions. CO3 Emphasizes on genetic organization of mammalian genome and hetero & CO autocatalytic functions of DNA.	
	BP 204T.PATHOPHYSIOLOGY CO11	CO1 Imparts a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms. CO2, Helps to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.	PO1, PO6
	BP205 T. COMPUTER APPLICATIONS IN PHARMACY CO12	CO1 Deals with the introduction Database, Database Management system, computer application in clinical studies and use of databases.	PO11
	BP 206 T. ENVIRONMENTAL SCIENCES CO13	CO1 Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. CO2 Includes physical and biological characters of the environment along with social and cultural factors and the impact of man on environment.	PO7
	BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II CO14	CO1 Deals with general methods of preparation and reactions of some organic compounds. CO2 Reactivity of organic compounds are also studied here. CO3 Emphasizes on	PO4, PO6

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		mechanisms and orientation of reactions. Chemistry of fats and oils are also included in the syllabus.	
II year	**BP302T. PHYSICAL PHARMACEUTICS-I CO15**	CO1 Deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. CO2 Demonstrate use of physicochemical properties in the formulation,development and evaluation of dosage forms	PO1, PO12
	BP 303 T. PHARMACEUTICAL MICROBIOLOGY CO16	CO1 Study of all categories of microorganisims especially for the production of alchol antibiotics, vaccines, vitamins enzymes etc. CO2 Understand the cell culture technology and its applications in pharmaceutical industries. CO3 Understand methods of identification, cultivation and preservation of various microorganisms.	PO9, PO6
	BP 304 T. PHARMACEUTICAL ENGINEERING CO17	CO1 Imparts a fundamental knowledge on the art and science of various unit operations used in pharmaceutical industry. CO2 Carry out various test to prevent environmental pollution. CO3. Appreciate and comprehend significance of plant lay out design for optimum use of resources.	PO5, PO11
	BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III CO18	CO1 Imparts knowledge on stereo-chemical aspects of organic compounds and organic reactions, important named reactions, chemistry of important hetero cyclic compounds. CO2 Emphasizes on medicinal and other uses of organic compounds.	PO4, PO6

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		CO3 Helps to write the reaction, name the reaction and orientation of reactions.	
	BP402T. MEDICINAL CHEMISTRY – I CO19	CO1 Imparts fundamental knowledge on the structure,chemistry and therapeutic value of drugs. CO2 Emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. CO3 Emphasizes on chemical synthesis of important drugs under each class.	PO4, PO6
	BP 403 T. PHYSICAL PHARMACEUTICS-II CO20	CO1 Deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. CO2 Understand various physicochemical properties of drug molecules in the designing the dosage forms.	PO1, PO12
	BP 404 T. PHARMACOLOGY-I CO21	CO1 Understand what drugs do to the living organisms and how their effects can be applied to therapeutics. CO2 Covers the information about the drugs like, mechanism of action, physiological and biochemical effects. CO3 Also Covers absorption, distribution, metabolism and excretion. CO4 Also deals with the adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes of drugs.	PO1, PO6
	BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I CO22	CO1 Involves the fundamentals of Pharmacognosy like scope, classification of crude drugs. CO2 Deals with their	PO1, PO6

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		identification and evaluation. CO3 Also deals with phytochemicals present in them and their medicinal properties.	
III year	**BP501T. MEDICINAL CHEMISTRY – II** **CO23**	CO1 Imparts fundamental knowledge on the structure,chemistry and therapeutic value of drugs. CO2 Emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. CO3 Emphasizes on chemical synthesis of important drugs under each class	PO4, PO6
	BP 502 T. Industrial PharmacyI **CO24**	CO1 Course enables the student to understand and appreciate the influence of pharmaceutical additives. CO2 Understand various pharmaceutical dosage forms on the performance of the drug product. CO3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their Quality.	PO5, PO11
	BP503.T. PHARMACOLOGY-II **CO25**	CO1 Imparts the fundamental knowledge on various aspects (classification, mechanism of action. CO2 Also deals with therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on different systems of body. CO3 Emphasizes is done on the basic concepts of bioassay.	PO1, PO6
	BP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II **CO26**	CO1 Imparts the students the knowledge of how the secondary metabolites are produced in the crude drugs. CO2 Deals with how to isolate and identify and produce them industrially. CO3 Involves the study of	PO1, PO6

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		producing the plants and phytochemicals through plant tissue culture, drug interactions and basic principles of traditional system of medicine	
	BP 505 T. PHARMACEUTICAL JURISPRUDENCE CO27	CO1 Imparts basic knowledge on important legislations related to the profession of pharmacy in India. CO2. Various Indian pharmaceutical Acts and Laws. CO3. The regulatory authorities and agencies governing the manufacture and sale of Pharmaceuticals. CO4. The code of ethics during the pharmaceutical practice.	PO5, PO8
	BP601T. MEDICINAL CHEMISTRY – III CO28	CO1 Imparts fundamental knowledge on the structure, chemistry and therapeutic value of drugs. CO2 Emphasizes on modern techniques of rational drug design like quantitative structure activity relationship (QSAR). CO3 Prodrug concept, combinatorial chemistry and Computer aided drug design (CADD). CO4 Emphasizes on the chemistry, mechanism of action, metabolism, adverse effects, Structure Activity Relationships (SAR), therapeutic uses and synthesis of important drugs.	PO4, PO6
	BP602 T. PHARMACOLOGY-III CO29	CO1 Imparts the fundamental knowledge on various aspects (classification, mechanism of action. CO2 Also about the therapeutic effects, clinical uses, side effects and Contraindications. of drugs acting on respiratory. and gastrointestinal system. CO3 Also deals with the study of infectious	PO1, PO6

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		diseases, immuno-pharmacology. CO4 Also emphasises on the principles of toxicology and chronopharmacology.	
	BP 603 T. HERBAL DRUG TECHNOLOGY **CO30**	CO1 Gives the student the knowledge of basic understanding of herbal drug Industry. CO2 Also deals with the quality of raw material, guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceutical etc. CO3 Emphasizes on Good Manufacturing Practices (GMP), patenting and regulatory issues of herbal drugs.	PO1, PO6
	BP 604 T. BIOPHARMACEUTICS AND PHARMACOKINETICS **CO31**	CO1 Imparts knowledge and skills of Biopharmaceutics and pharmacokinetics. CO2 Deals with their applications in pharmaceutical development, design of dose and dosage regimen and in solving the problems arised therein. CO3.Understand the concepts of bioavailability and bioequivalence of drug products and their significance.	PO1, PO3, PO12
	BP 605 T. PHARMACEUTICAL BIOTECHNOLOGY **CO32**	CO1 Scientific application of biotechnology in the field of genetic engineering, medicine and fermentation technology makes subject interesting. CO2 Deals with new biological revolutions in diagnosis, prevention and cure of diseases. CO3 Deals with new and cheaper pharmaceutical drugs. CO4 It is basically a research-based subject.	PO9, PO6
	BP606TPHARMACEUTICAL QUALITY ASSURANCE **CO33**	CO1 Deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries.	PO5, PO8

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		CO2 Deals with the important aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs.	
IV year	**BP701T. INSTRUMENTAL METHODS OF ANALYSIS CO34**	CO1 Deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. CO2 Imparts a fundamental knowledge on the principles and instrumentation of spectroscopic and chromatographic technique. CO3 Emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.	PO2, PO5, PO6
	BP 702 T. INDUSTRIAL PHARMACYII CO35	CO1 Imparts fundamental knowledge on pharmaceutical product development and translation from laboratory to market. CO2. Understand the process of technology transfer from lab scale to commercial batch. CO3. Know different Laws and Acts that regulate pharmaceutical industry. CO4. Understand the approval process and regulatory requirements for drug product	PO5, PO6
	BP 703T. PHARMACY PRACTICE CO36	CO1 Helps in learning various skills like drug distribution, drug information, and therapeutic drug monitoring for improved patient care. CO2 Deals with various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication. CO3 Patient counseling for improved patient care in the community set up.	PO5, PO6, PO12
	BP 704T: NOVEL DRUG DELIVERY SYSTEMS	CO1 Imparts basic knowledge on the area of novel drug	PO1, PO3

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	CO37	delivery systems. CO2. Understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation.	
	BPS01T. BIOSTATISITCS AND RESEARCH METHODOLOGY **CO38**	CO1 Understand the applications of Biostatics in Pharmacy. CO2 Deals with descriptive statistics, Graphics, Correlation, Regression, logistic regression Probability theory, Sampling technique, Parametric tests, Non Parametric tests& ANOVA. CO3 Introduction to Design of Experiments, Phases of Clinical trials and Observational and Experimental studies, SPSS, R and MINITAB statistical software's, analyzing the statistical data using Excel.	PO6,PO9
	BP 802T SOCIAL AND PREVENTIVE PHARMACY **CO39**	CO1 Deals with health issues and their challenges. CO2 Introduced a number of national health programmes. CO3 The role of the pharmacist in these contexts are also discussed.	PO6, PO7
	BP803ET. PHARMA MARKETING MANAGEMENT **CO40**	CO1 The Knowledge and Know-how of marketing management CO2 Role in Sales and Product management.	PO5,PO6, PO11
	BP804 ET: PHARMACEUTICAL REGULATORY SCIENCE **CO41**	CO1 Fundamental knowledge on the regulatory requirements for approval of new drugs, and drug products in regulated markets of India & other CO2 Prepares the students to learn in detail on the regulatory requirements, documentation requirements, and registration procedures for marketing the drug products.	PO5, PO8
	BP 805T:	CO1Basic terminologies used in	PO5, PO8

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	PHARMACOVIGILANCE CO42	pharmacovigilance, global scenario of Pharmacovigilance CO2 Develops the skills of classifying drugs, diseases and adverse drug reactions.	
	BP 806 ET. QUALITY CONTROL AND STANDARDIZATION OF HERBALS CO43	CO1 Various methods and guidelines for evaluation and standardization of herbs and herbal drugs. CO2 Provides an opportunity for the student to learn cGMP, GAP and GLP in traditional system of medicines.	PO1
	BP 807 ET. COMPUTER AIDED DRUG DESIGN CO44	CO1 Provides detailed knowledge of rational drug design process and various techniques used in rational drug design process. CO2. The role of drug design in drug discovery process. CO3.The concept of QSAR and docking. CO4.Various strategies to develop new drug like molecules.□	PO11
	BP808ET: CELL AND MOLECULAR BIOLOGY (Elective subject) CO45	CO1 Study of cells – their physiological properties, their structure, the organelles they contain, interactions with their environment, their life cycle, division, death and cell function. CO2 Cell biology research	PO1
	BP809ET. COSMETIC SCIENCE(Theory) CO46	CO1 Deals with the study of cosmetics including their preparation, uses and effects. CO2 Also deals with their industrial aspects.	PO1
	BP810 ET. PHARMACOLOGICAL SCREENINGMETHODS CO47	CO1 Imparts the basic knowledge of preclinical studies in experimental animals. CO2. Appreciate and demonstrate the importance of biostatistics and research methodology.	PO1
	BP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES	CO1 Deals with the application of instrumental methods in qualitative and	PO1

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	CO48	quantitative analysis of drugs. CO2 Imparts advanced knowledge on the principles and instrumentation of spectroscopic and chromatographic hyphenated techniques. CO3 Emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.	
	BP 812 ET. DIETARY SUPPLEMENTS AND NUTRACEUTICALS CO49	CO1 Understands the need and requirements of dietary supplements among different groups in the population. CO2. Understand the outcome of deficiencies in dietary supplements. CO3. Appreciate the components in dietary supplements and the application.	PO12

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M.PHARM

(PHARMACEUTICS)

S.no	Name of the program	Name of the course	Course outcome	Program Outcome
1	M.Pharm	**Modern Pharmaceutical Analytical Techniques**	CO1 Develops clear insight about theoretical and practical skills of the instruments used in pharmaceutical industry. CO2 Helps in dealing with their industrial use as well as in research. CO3 Helps in interpretation of the data.	PO2,PO4
2		**Drug Delivery system**	CO1 Categorizes new drug delivery systems and formulations. CO2 Imparts a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms. CO3. Pharmaceutical calculations and Preparation of various conventional dosage forms.	PO2,PO3,PO12
3		**Modern Pharmaceutics**	CO1 Establishes process of development of ethical and quality considerations of medical devices.	PO1, PO2
4		**Regulatory Affairs**	CO1 Develops Pharmacovigilence and process of monitoring in clinical trials. CO2 Various Indian pharmaceutical Acts and Laws. CO3. The regulatory authorities and agencies governing the manufacture and sale	PO5, PO8

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			of Pharmaceuticals. CO4. The code of ethics during the pharmaceutical practice.	
5		**Molecular Pharmaceutics (Nano Tech and targeted DDS)**	CO1 Establishes knowledge of Novel drug delivery systems. CO2 Helps in understanding its use in daily life. CO3 Helps in differentiating between normal and novel drug delivery system. CO4. Understands the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation.	PO1,PO2
6		**Advanced Biopharmaceutics and pharmacokinetics**	CO1 Develops the student for designing and evaluation of dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters. CO2 It also deals with their applications in pharmaceutical development, design of dose and dosage regimen and in solving the problems arised therein. CO3. Understands the concepts of bioavailability and bioequivalence of drug products and their significance.	PO1, PO2,PO3
7		**Computer Aided drug delivery System**	CO1 Develops Computer skills for Preclinical Development and Optimization Techniques in Pharmaceutical Formulation. CO2 This subject deals with the introduction Database, Database Management system, computer application in clinical studies and use of databases.	PO11
8		**Cosmetics and Cosmeceuticals**	CO1 Deals with the study of cosmetics including their preparation, uses and effects. CO2 Also deals with their industrial aspects. CO3 Establishes skill of development of new combinations.	PO1, PO2

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Program Outcome

PO1: Pharmaceutical Knowledge:- Students achieve a deep knowledge regarding human body, its related diseases, analytical skills, drug molecules (Active Pharmaceutical Ingredients) along with excipients, natural drug resources, chemistry involved in API including synthesis of commonly used drugs, effect of drug on human body, toxicity and impurity profile, ADME studies of drugs (behavior of drug in human body), dosage form studies including novel approaches, designing and development of formulation stability studies, analysis etc

PO2: Research Analysis: Develops knowledge in research field to make new relevant discoveries and to identify new entities.

PO3: Design & Development of dosage forms: Describes preparation of various dosage forms that could be prepared by the pharmacy students in the pharmaceutical companies for the ease of patients and to optimize formulations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5: Modern methods usage: Create, select, and apply appropriate techniques, resources and modern methods with an understanding of the limitations and its usage. The student also learns to handle many instruments related to their studies which would help them work in a Pharmaceutical Industry, pharmacovigilance, regulatory requirements, legal processes etc.

PO6: Pharmacy and society: Pharmacist provide complete health care data and practices to the people of the society and guide them to be healthy. The student also learns drug distribution system, patient counseling, industrial laws etc. Students achieve expertise in storage and distribution of drugs with all precautions and in-depth knowledge of dose, adverse effect and other health related issues to deal with ambulatory and IPD patients in hospitals and also in public and achieve responsibility of computing profession and society.

PO7: Environment and sustainability: Locate the impact of the professional pharmacist in society and environment and make an impact of it on the people of the society.

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PO8: Ethics: Justify & apply ethical principle and commit to professional ethics and responsibilities and norms of the pharmacy practice. Student is also trained in ethical behavior with physician, nurses and other paramedical staff for protecting patient's health.

PO9: Individual and team work: Function effectively as an individual and as a member or leader in diverse teams acts as a multidisciplinary person in every context. Students will be able to demonstrate rigorous and independent thinking and encourage participatory decision making in teams.

PO10: Communication: Develops Communication effectively on pharmaceutical activities with the community and with society.

PO11: Life-long learning: Recognize the need and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change and implement those technology by gaining experience.

PO12: Social Interaction: Being a public welfare job, a pharmacist would be able to interact with the people in a better way to cure them and make them feel healthy also investigate and evaluate the general state of public health conditions and concerns and develop and apply appropriate programs of action within program content area

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Program Specific Outcome

Some of the program specific outcomes are mentioned below:

PSO 1: Prepared to implement the knowledge gained during the course of the program from pharmacology, pharmaceutics, medicinal chemistry, pharmacognosy, APHE, communication skills, pharmaceutical analysis, biotechnology, biochemistry, cosmetology and environmental studies.

PSO 2: Develops knowledge of ethical and management principle required to work in a team as well as to lead a team.

PSO 3: Achieve multidisciplinary jobs in the pharmaceutical industries in various branches and would be able to write relevant and effective project reports in multidisciplinary environment in the context of changing technologies.

PSO4 Prepares to communicate easily and effectively. Would be able to perform multitasks in multifields including pharmaceuticals & cosmetic in timebound manner. Research area would be the key element.

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