

College of Pharmacy
Teerthanker Mahaveer University

B.Pharm. (Bachelor of Pharmacy)

Programme Outcome

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| 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 (e.g. health care professionals, promoters of health, educators, managers, employers, 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

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| 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

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| 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 |

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| | | 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 humans. |
| BPHP 151 | CO-1 | Understanding the anatomy and physiology of different systems of our body. |
| | CO-2 | Explaining homeostatic mechanisms in human body along with structure and functions of tissues and organs. |
| | CO-3 | Demonstrating various experimental techniques in determining 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 physico-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 |

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| | | 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 of DNA in the synthesis of RNAs and proteins. |
| BPHT204 | CO-1 | Understanding the etiology and pathogenesis of the selected disease conditions. |
| | CO-2 | Understanding concepts, principles of pathophysiology and identifying responses related to pathophysiologic processes results in disease. |
| | CO-3 | 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 |
| BPHP253C | CO-1 | Determining blood and urine components qualitatively and quantitatively. |
| | CO-2 | Identifying and analyzing the contents of different biomolecules in body fluids. |
| BPHP254 | CO-1 | Understanding basic concepts of HTML and its use in creating websites. |

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| | 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 pharmaceutical manufacturing. |
| | CO-4 | Applying various methods for prevention of corrosion of materials used in pharmaceutical plant construction. |
| BPHP351 | CO-1 | Explaining various laboratory techniques involved in synthesis of organic compounds. |
| | CO-2 | Standardizing oils and reagents. |
| | CO-3 | Synthesizing organic compounds. |
| BPHP352 | CO-1 | Understanding various physicochemical properties of a drug molecule. |
| | CO-2 | Determining various physicochemical parameters of a drug molecule to be utilized for developing a stable formulation. |
| BPHP353 | CO-1 | Demonstrating operation of various equipment and processes used in 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. |

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| | 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. |
| BPHT404 | CO-1 | Understanding the pharmacological actions of different categories of drugs. |
| | CO-2 | Explaining mechanism of drug action at organ / subcellular / macromolecular level. |
| | CO-3 | Illustrating effect of drugs on animal models. |
| | CO-4 | Applying pharmacological knowledge in prevention and treatment of diseases. |
| BPHT405T | CO-1 | Understanding the techniques in the cultivation and production of crude 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 chemical tests and microscopical examination. |
| | CO-2 | Analysing various physic-chemical parameters of crude drugs for its standardization. |
| BPHT501 | CO-1 | Understanding the chemistry of drugs with respect to their 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 manufacture and sale of pharmaceuticals. |
| | CO-3 | Demonstrating various Acts and Laws pertaining to manufacturing, sale and distribution of drugs and pharmaceuticals in India. |
| | CO-4 | Applying the code of ethics during the pharmaceutical practice. |
| BPHP551 | CO-1 | Understanding the importance of preformulation and rational behind use 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. |

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| | 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 of pharmaceuticals. |
| | CO-3 | Explaining the production/processing and storage of some of the antibiotics, vitamins, blood product and plasma substitutes. |
| | CO-4 | Employing the use of microorganisms in fermentation technology. |
| BPHT606 | CO-1 | Understanding the cGMP aspects, scope of quality, certifications applicable to pharmaceutical industries. |
| | CO-2 | Explaining the responsibilities of QA & QC departments and regulatory aspects of pharmaceuticals. |
| BPHP651 | CO-1 | Illustrating structures and its activity using chem draw [®] . |
| | 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 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. |
| BPHT751 | CO-1 | Understanding operational principles of different analytical instruments |
| | CO-2 | Analyzing drugs quantitatively and qualitatively with different instrumental techniques. |
| | CO-3 | Assessing drug formulations with reference to pharmacopoeial monograph. |
| BPHT752 | CO-1 | Understanding the working of any one of the following departments through experiential learning. <ul style="list-style-type: none"> • 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 |

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| | | 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 pharmacovigilance as per ICH guidelines in detection, assessment and reporting of ADRs. |
| | CO-3 | Analysing and reporting new adverse drug reactions. |
| | CO-4 | Evaluating drug safety in paediatrics, geriatrics, pregnancy and lactating mothers. |
| BPHT806 | CO-1 | Understanding WHO, ICH and EU guidelines for quality control 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 strategies to develop new drug like molecule. |
| | CO-3 | Describing the design of new drug molecules using molecular modelling 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. |
| BPHT809 | 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. |

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| BPHT811 | CO-1 | Understanding 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. |