BAREILLY INTERNATIONAL UNIVERSITY
BIU COLLEGE OF PHARMACY

Rohilkhand Medical College & Hospital Campus, Pilibhit by Pass Road, Bareilly.
(U.P) – 243006 INDIA
E-mail: biucollegeofpharmacy@gmail.com

PROGRAM: B. PHARM

Program Outcomes (POs)

PO No.	Programme Outcome	Learning Point
PO 1	**Pharmacy Knowledge**	Possess and apply the knowledge of chemical synthesis and evaluation, pharmaceutical technologies and pharmacology, formulation and development of pharmaceuticals.
PO 2	**Problem analysis and development of solutions**	Develop an ability to identify and analyze the problem and interpret data generated from formulation development, quality control and quality assurance to find the solutions.
PO 3	**Conduct investigations of complex problems**	Use research-based knowledge and research methods including design of experiments, analysis and elucidation of data and synthesis to provide valid conclusions
PO 4	**Modern tool usage**	Create, select and apply appropriate techniques, resources and modern IT tools to complex activities in the field of pharmacology and chemistry with an understanding of limitations.
PO 5	**Competency**	Pharmacy graduate, with employable skills and high technical competence for Pharmaceutical Industry and Healthcare sector.
PO 6	**Environment and sustainability**	Understand the impact of Pharmacy Professional solutions in societal and environmental contexts and strive for the eco-friendly pharmaceutical operations / services to maintain public health.
PO 7	**Pharmaceutical ethics**	Apply ethical principles and commit to professional ethics and responsibilities and norms of pharmacy practice. Apply ethical principles while making decisions and take responsibility for the outcome associated decisions
PO 8	**Individual and team work**	function effectively as an individual and as an active member or a leader in healthcare team and in multidisciplinary setting
PO 9	**Communication**	Able to communicate effectively in both verbal and written form
PO 10	**Project management and finance**	Demonstrate knowledge and understanding of the basic pharmaceutical sciences and management principles and apply these to one's own work as a member and leader in a team to manage projects
PO 11	**Entrepreneurship**	Develop entrepreneurship skills that support the growth of Pharmaceutical Industry/Pharmaceutical Services leading to economic development.
PO 12	**Lifelong learning**	Recognize the need for and have the preparation and ability to engage in independent and lifelong learning and develop an aptitude of continuous professional development

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Program Specific Outcomes (PSOs)

Sl. No.	Program Specific Outcomes (PSOs)
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 products
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

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Course Outcome (COs)

Course Code		CO	Type of CO
17094	*Human Anatomy and Physiology - I (Theory)*	CO1.	Understanding the gross morphology, structure and functions of various organs of the human body
		CO2.	Understanding various pathological conditions of human body.
		CO3.	Remembering the functions of different organ and systems of human body.
17760	*Human Anatomy and Physiology - I (Practical)*	CO1.	Understanding the anatomy and physiology of different systems of our body.
		CO2.	Explaining homeostatic mechanisms in human body along with structure and functions of tissues and organs.
		CO3.	Demonstrating various experimental techniques in determining physiological conditions of the body.
17095	*Pharmaceutical Analysis – I (Theory)*	CO1.	Understanding the principles of volumetric and electro chemical analysis.
		CO2.	Understanding various procedures used for volumetric and electrochemical titrations.
		CO3.	Remembering various procedures used for analyzing drugs and pharmaceuticals.
		CO4.	Remembering the principles used for standardization of pharmaceuticals.
17761	*Pharmaceutical Analysis – I (Practical)*	CO1.	Demonstrating the preparation and standardization of some compounds.
		CO2.	Illustrating the assay of compounds and standardization of titrant.
		CO3.	Analyzing the limit test and normality by electro-analytical methods.
17097	*Pharmaceutics - I (Theory)*	CO1.	Understanding the history of profession of pharmacy from Indian perspective and as a whole.
		CO2.	Understanding the basics of requirements for development of different dosage forms.
		CO3.	Remembering the formulation procedures for development of various dosage forms.

17096	***Pharmaceutics - I (Practical)***	**CO1.**	Understanding use of ingredients in pharmaceutical formulation development.
		CO2.	Formulating various conventional dosage forms.
		CO3.	Evaluating various pharmaceutical formulation for its quality and effectiveness.
17762	***Pharmaceutical Inorganic Chemistry I (Theory)***	**CO1.**	Understanding medicinal and pharmaceutical importance of inorganic compounds.
		CO2.	Understanding various methods used for preparation of inorganic pharmaceutical compounds.
		CO3.	Remembering the sources and methods used to determine the impurities in inorganic compounds.
17763	***Pharmaceutical Inorganic Chemistry I (Practical)***	**CO1.**	Demonstrating the preparation and standardization of some compounds.
		CO2.	Illustrating the assay of compounds and standardization of titrant.
		CO3.	Analyzing the limit test and normality by electro-analytical methods.
17098	***Communication Skills (Theory)***	**CO1.**	Understanding the principles and process of communication.
		CO2.	Recognizing the barriers of communication.
		CO3.	Understanding the modes of verbal and non-verbal communication.
		CO4.	Remembering the basics of interpersonal, oral and written communication skills.
17764	***Communication Skills (Practical)***	**CO1.**	Understand the behavioral needs for a pharmacist to function effectively in the areas of pharmaceutical operation
		CO2.	Communicate effectively (Verbal and Non-Verbal)
		CO3.	Effectively manage the team as a team player
		CO4.	Develop interview skills
		CO5.	Develop Leadership qualities and essentials
17099	***Remedial Biology (Theory)***	**CO1.**	Understanding classification and salient features of plant and animal kingdoms.
		CO2.	Understanding the anatomy & physiology of plants and animals.
		CO3.	Remembering the anatomy & physiology of animals in relevance to humans.

17765	***Remedial Biology (Practical)***	**CO1.**	Demonstrating microscopic structure of cells and tissues of both plant and animals.
		CO2.	Analyzing various physiological conditions of human such as blood group, blood pressure & tidal volume, etc.
17100	***Remedial Mathematics (Theory)***	**CO1.**	Understanding the basic concepts of mathematical theory, formulas and their applications in Pharmacy.
		CO2.	Understanding the application of Mathematics in Pharmacy.
		CO3.	Remembering different formulas used in pharmaceutical calculations.
17101	***Human Anatomy and Physiology – II (Theory)***	**CO1.**	Understanding the structure and functions of various organs of the human body.
		CO2.	Explaining various homeostatic mechanisms and their imbalances in human body.
		CO3.	Identifying the interlinked mechanisms of homeostasis in human body.
		CO4.	Analyzing the hematological tests and vital signs and symptoms.
17766	***Human Anatomy and Physiology – II (Practical)***	**CO1.**	Understanding gross morphology, structure and functions of various organs of the human body.
		CO2.	Demonstrating function of various organs and systems of human body with appropriate models
		CO3.	Analyzing various physiological parameters of body fluids
17102	***Pharmaceutical Organic Chemistry – I (Theory)***	**CO1.**	Understanding nomenclature, structure, name and the type of isomerism of organic compounds.
		CO2.	Remembering chemical reactions, and preparation of organic compounds.
		CO3.	Identifying the organic compounds.
17767	***Pharmaceutical Organic Chemistry – I (Practical)***	**CO1.**	Determining presence of elements and functional groups in organic compounds
		CO2.	Analyzing organic compounds qualitatively
		CO3.	Constructing molecular models
		CO4.	Synthesizing organic compounds

17103	***Biochemistry (Theory)***	**CO1.**	Understanding the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
		CO2.	Describing the metabolism of nutrient molecules in physiological and pathological conditions.
		CO3.	Explaining the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
17768	***Biochemistry (Practical)***	**CO1.**	Determining blood and urine components qualitatively and quantitatively.
		CO2.	Identifying and analyzing the content of different biomolecules in body fluids.
17104	**Pathophysiology *(Theory)***	**CO1.**	Understanding the etiology and pathogenesis of the selected disease conditions.
		CO2.	Understanding concepts, principles of pathophysiology and identifying responses related to pathophysiologic processes results in disease.
		CO3.	Analyzing the complications of the diseases.
17105	***Computer Applications in Pharmacy (Theory)***	**CO1.**	Understanding application of computers in pharmacy.
		CO2.	Recognizing concept of information system, software and bioinformatics.
		CO3.	Applying computers for data analysis in preclinical development.
17769	***Computer Applications in Pharmacy (Practical)***	**CO1.**	Determining blood and urine components qualitatively and quantitatively.
		CO2.	Identifying and analyzing the contents of different biomolecules in body fluids.
17106	***Environmental Sciences***	**CO1.**	Understanding concepts &sources of environment and its associated problems and measures to control.
		CO2.	Describing the ecosystems.
		CO3.	Analyzing human impacts on the environment.
17107	***Pharmaceutical Organic Chemistry – II (Theory)***	**CO1.**	Understanding the mechanism of a chemical reaction and isomerism of organic Compounds.
		CO2.	Explaining the orientation and name of a chemical reaction.
		CO3.	Demonstrating preparation, reactivity and stability of organic compounds.

17770	***Pharmaceutical Organic Chemistry – II (Practical)***	**CO1.**	Explaining various laboratory techniques involved in synthesis of organic compounds.
		CO2.	Standardizing oils and reagents.
		CO3.	Synthesizing organic compounds.
17108	***Physical Pharmaceutics – I (Theory)***	**CO1.**	Understanding various physicochemical parameters of drugs.
		CO2.	Understanding various physicochemical properties of a drugs and pharmaceuticals used for dosage form design.
		CO3.	Remembering various methods to determine physicochemical parameters of a drugs and pharmaceuticals.
17771	***Physical Pharmaceutics – I (Practical)***	**CO1.**	Understanding various physicochemical properties of a drug molecule.
		CO2.	Determining various physicochemical parameters of a drug molecule to be utilized for developing a stable formulation.
17109	***Pharmaceutical Microbiology (Theory)***	**CO1.**	Understanding various methods of identification, cultivation and preservation of microorganisms.
		CO2.	Describing various methods of sterilization and sterility testing for pharmaceutical Products.
		CO3.	Recognizing concept of cell culture technology and its applications in pharmaceutical industries.
		CO4.	Analyzing microbiological standardization of pharmaceuticals.
17772	***Pharmaceutical Microbiology (Practical)***	**CO1.**	Demonstrating operation of various equipment and processes used in experimental microbiology.
		CO2.	Practicing various microbiological assays as well as sterility tests for pharmaceuticals.
17110	***Pharmaceutical Engineering (Theory)***	**CO1.**	Understanding various unit operation and material handling techniques used in pharmaceutical industries.
		CO2.	Recognizing the appropriate materials for pharmaceutical plant construction.
		CO3.	Understanding and demonstrating steps in various processes involved in pharmaceutical manufacturing.
		CO4.	Applying various methods for prevention of corrosion of materials used in pharmaceutical plant construction.

17773	***Pharmaceutical Engineering (Practical0***	**CO1.**	Understanding various unit operation and material handling techniques used in pharmaceutical industries.
		CO2.	Demonstrating various processes involved in pharmaceutical manufacturing.
		CO3.	Analyzing various parameters of unit operation process.
17111	***Pharmaceutical Organic Chemistry - III (Theory)***	**CO1.**	Understanding the methods of preparation and properties of organic compounds.
		CO2.	Explaining stereo chemical aspects and reactions of organic compounds.
		CO3.	Demonstrating medicinal use and other application of organic compounds.
17112	***Medicinal Chemistry – I (Theory)***	**CO1.**	Understanding the chemistry of drugs, their pharmacological activities, metabolic pathways, adverse effect and therapeutic values.
		CO2.	Demonstrating the structure activity relationship (SAR) of different classes of drugs.
		CO3.	Illustrating the chemical synthesis of some drugs.
17774	***Medicinal Chemistry – I (Practical)***	**CO1.**	Recognizing various mechanisms for synthesis of drugs or their intermediates.
		CO2.	Explaining the principal involved in assay of drugs in dosage forms.
		CO3.	Illustrating different physico-chemical properties of various classes of drug.
17113	***Physical Pharmaceutics – II (Theory)***	**CO1.**	Understanding various physiochemical characteristics of drugs and pharmaceuticals in dosage form design.
		CO2.	Understanding reaction kinetics in relation to stability of drugs and dosage forms.
		CO3.	Remembering the use of various physicochemical parameters in relation to formulation development.
17775	***Physical Pharmaceutics – II (Practical)***	**CO1.**	Understanding role of different physiochemical parameters in dosage form designing.
		CO2.	Determining various physiochemical parameters of drug and excipients using various instrumental techniques.
17114	***Pharmacology – I (Theory)***	**CO1.**	Understanding the pharmacological actions of different categories of drugs.
		CO2.	Explaining mechanism of drug action at organ/sub- cellular/macromolecular level.

		CO3.	Illustrating effect of drugs on animal models.
		CO4.	Applying pharmacological knowledge in prevention and treatment of diseases.
17776	***Pharmacology – I (Practical)***	**CO1.**	Understanding the use of instruments and techniques in experimental pharmacology.
		CO2.	Demonstrating the different routes of drug administration on animal models.
		CO3.	Analyzing drug actions using simulated experiments on animal models.
17115	***Pharmacognosy & Phytochemistry - I (Theory)***	**CO1.**	Understanding the techniques in the cultivation and production of crude drugs.
		CO2.	Describing the crude drugs, their uses and chemical nature.
		CO3.	Illustrating the evaluation techniques for the herbal drugs.
		CO4.	Analysing the microscopic and morphological evaluation of crude drugs.
17777	***Pharmacognosy & Phytochemistry - I (Practical)***	**CO1.**	Illustrating various physic-chemical parameters of crude drugs through chemical tests and microscopical examination.
		CO2.	Analysing various physic-chemical parameters of crude drugs for its standardization.
17116	***Medicinal Chemistry – II (Theory)***	**CO1.**	Understanding the chemistry of drugs with respect to their pharmacological activity.
		CO2.	Explaining drug metabolic pathways, adverse effects and therapeutic values of drugs.
		CO3.	Describing structural Activity Relationship of different class of drugs.
		CO4.	Demonstrating synthesis of selected drugs.
17038	***Industrial Pharmacy - I (Theory)***	**CO1.**	Understanding concepts and factors in development of pharmaceutical dosage forms.
		CO2.	Describing various pharmaceutical dosage forms and their manufacturing techniques.
		CO3.	Illustrating formulation of solid, liquid and semisolid dosage forms.
		CO4.	Evaluating different dosage forms for its quality and stability.

17728	***Industrial Pharmacy - I (Practical)***	**CO1.**	Understanding the importance of preformulation and rational behind use of formulation ingredients.
		CO2.	Stating the functioning of various equipment's used for liquid, solid, and semisolid dosage form formulations.
		CO3.	Formulating various dosage forms.
		CO4.	Evaluating various dosage forms for its quality and efficacy.
17040	***Pharmacology -II (Theory)***	**CO1.**	Understanding the mechanism of drug actions in relevance to its therapeutic use.
		CO2.	Illustrating drug's action in isolated tissues or organs using simulated animal model.
		CO3.	Demonstrating various receptor mediated actions using isolated tissue preparations.
		CO4.	Analyzing correlation of pharmacology with related medical sciences.
17729	***Pharmacology -(Practical)***	**CO1.**	Demonstrating drug effects using computer model.
		CO2.	Estimating biochemical parameters in body fluids.
		CO3.	Experimenting on isolated tissue preparation and *in vivo* studies.
		CO4.	Analysing various receptor site interactions using isolated tissue preparations.
17041	***Pharmacognosy & Phytochemistry – II (Theory)***	**CO1.**	Understanding modern extraction techniques, isolation, characterization and identification of the herbal drugs and its phytoconstituents.
		CO2.	Demonstrating the preparation and development of herbal formulations.
		CO3.	Interpreting herbal drug interactions.
		CO4.	Analysing isolated phytoconstituents for its chemical nature and structural Configuration.
17730	***Pharmacognosy & Phytochemistry – II (Practical)***	**CO1.**	Examining phytoconstituents belongs to different chemical groups.
		CO2.	Analysing crude drugs by chemical tests.
		CO3.	Evaluating and characterizing crude drugs belongs to various chemical class

17042	***Pharmaceutical Jurisprudence (Theory)***	**CO1.**	Understanding the pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
		CO2.	Recognizing various regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
		CO3.	Demonstrating various Acts and Laws pertaining to manufacturing, sale and distribution of drugs and pharmaceuticals in India.
		CO4.	Applying the code of ethics during the pharmaceutical practice.
17043	***Medicinal Chemistry – III (Theory)***	**CO1.**	Understanding the chemistry of drugs with respect to their pharmacological activity.
		CO2.	Explaining the importance of drug design and different techniques of drug design.
		CO3.	Describing structural Activity Relationship of different classes of drug.
		CO4.	Demonstrating the drug metabolic pathways, adverse effect and therapeutic value of drugs.
17731	***Medicinal Chemistry – III (Practical)***	**CO1.**	Illustrating structures and its activity using chem draw®.
		CO2.	Determining physiochemical properties of drugs using drug design software
		CO3.	Analyzing drugs and their intermediates through assay.
		CO4.	Synthesizing drugs and their intermediates.
17044	***Pharmacology – III (Theory)***	**CO1.**	Understanding the mechanism of drug actions in relevance to its therapeutic use.
		CO2.	Recognizing the principles of toxicology and treatment of poisoning.
		CO3.	Analyzing correlation of pharmacology with related medical sciences.
17732	***Pharmacology – III (Practical)***	**CO1.**	Interpreting the relationship between dosage calculation and activity of the drug.
		CO2.	Applying the biostatistical methods in experimental pharmacology.
		CO3.	Analyzing drugs through bioassays.
		CO4.	Evaluating the toxic effects of drug on animal tissues.

17045	***Herbal Drug Technology (Theory)***	**CO1.**	Understanding raw material as source of herbal drugs from cultivation to herbal drug product.
		CO2.	Explaining the WHO and ICH guidelines for evaluation of herbal drugs.
		CO3.	Recognizing the herbal cosmetics, natural sweeteners, nutraceuticals.
		CO4.	Illustrating patenting of herbal formulations.
17733	***Herbal Drug Technology (Practical)***	**CO1.**	Demonstrating toxicity studies of herbal drugs on animal models.
		CO2.	Analyzing herbal formulations to comply Pharmacopoeial standard.
		CO3.	Formulating different herbal solid, semisolid and liquid dosages forms.
17046	***Biopharmaceutics and Pharmacokinetics (Theory)***	**CO1.**	Understanding basic concepts in biopharmaceutics and pharmacokinetics and their significance.
		CO2.	Describing the concepts of bioavailability and bioequivalence of drug products and their significance.
		CO3.	Applying pharmacokinetic parameters in calculation and fixation of dosage regimen.
		CO4.	Analyzing plasma drug concentration versus time data to calculate pharmacokinetic parameters and profiles of drug/formulations.
17047	***Pharmaceutical Biotechnology (Theory)***	**CO1.**	Understanding basic concepts of biotechnology and its application in pharmaceutical industries.
		CO2.	Demonstrating genetic engineering applications in relation to production of pharmaceuticals.
		CO3.	Explaining the production/processing and storage of some of the antibiotics, vitamins, blood product and plasma substitutes.
		CO4.	Employing the use of microorganisms in fermentation technology.
17048	***Pharmaceutical Quality Assurance (Theory)***	**CO1.**	Understanding the cGMP aspects, scope of quality certifications applicable to pharmaceutical industries.
		CO2.	Explaining the responsibilities of QA & QC departments and regulatory aspects of pharmaceuticals.
17049	***Instrumental Methods of Analysis (Theory)***	**CO1.**	Understanding the interaction of matters with electromagnetic radiations and its application in drug analysis.
		CO2.	Understanding the chromatographic separation and analysis of drugs.
		CO3.	Performing quantitative & qualitative analysis of drugs using various analytical instruments.

17734	***Instrumental Methods of Analysis (Practical)***	**CO1.**	Understanding operational principles of different analytical instruments
		CO2.	Analyzing drugs quantitatively and qualitatively with different instrumental techniques.
		CO3.	Assessing drug formulations with reference to Pharmacopoeial monograph.
17128	***Industrial Pharmacy – II (Theory)***	**CO1.**	Understanding the process of pilot plant and scale up techniques for pharmaceutical dosage forms.
		CO2.	Describing the process of technology transfer from lab scale to commercial batch.
		CO3.	Demonstrating regulatory requirements for drug approval and clinical studies.
17051	***Pharmacy Practice (Theory)***	**CO1.**	Understanding the management of hospital, hospital pharmacy and community pharmacy, inventory control &drug distribution system.
		CO2.	Identifying drug related problems, adverse drug reactions and monitoring drug therapy of patient by interpreting laboratory results and clinical review.
		CO3.	Practicing medication history interview, patient counselling and promoting rational drug use.
17052	***Novel Drug Delivery System (Theory)***	**CO1.**	Understanding various approaches in development of novel drug delivery systems.
		CO2.	Defining the criteria for selection of drugs and polymers for development of novel drug delivery systems.
		CO3.	Formulating various novel drug delivery systems.
		CO4.	Evaluating various novel drug delivery systems.
17735	***Practice School (Practical)***	**CO1.**	Understanding the working of any one of the following departments 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
17054	***Biostatistics and Research Methodology (Theory)***	**CO1.**	Understanding various statistical techniques to solve statistical problems
		CO2.	Recognizing the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment).
		CO3.	Applying statistical techniques in solving the problems.

17055	***Social and Preventive Pharmacy (Elective Theory)***	**CO1.**	Understanding current issues related to health and pharmaceutical problems within the country and worldwide.
		CO2.	Recognizing current healthcare development programs including national health policies &programmes and role of WHO (World Health Organization).
		CO3.	Demonstrating prevention and control of communicable and non-communicable Diseases.
		CO4.	Evaluating alternative ways of solving problems related to health and pharmaceutical issues.
17056	***Pharma Marketing Management (Elective Theory)***	**CO1.**	Understanding marketing concepts and techniques used pharmaceutical industry.
		CO2.	Applying marketing concepts and techniques for pharmaceutical product decision, promotion and pricing.
17057	***Pharmaceutical Regulatory Science (Elective Theory)***	**CO1.**	Understanding the process of drug discovery and development.
		CO2.	Recognizing regulatory authorities and agencies governing the manufacturing, sales and distribution of pharmaceutical products.
		CO3.	Demonstrating regulatory approval process their registration in Indian and international markets.
17058	***Pharmacovigilance (Elective Theory)***	**CO1.**	Understanding drug safety concepts, history, development and national / international scenarios of pharmacovigilance.
		CO2.	Practicing pharmacovigilance as per ICH guidelines in detection, assessment and reporting of ADRs.
		CO3.	Analyzing and reporting new adverse drug reactions.
		CO4.	Evaluating drug safety in pediatrics, geriatrics, pregnancy and lactating mothers.
17059	***Quality Control & Standardizations of Herbals (Elective Theory)***	**CO1.**	Understanding WHO, ICH and EU guidelines for quality control of herbal drugs and concept of quality assurance in herbal drug industry.
		CO2.	Demonstrating regulatory requirements and approval process for herbal drug registration in Indian and international markets.
17060	***Computer Aided Drug Design (Elective Theory)***	**CO1.**	Understanding the role of drug design and discovery of lead molecule in drug discovery process.
		CO2.	Recognizing the concept of QSAR, molecular docking and various strategies to develop new drug like molecule.
		CO3.	Describing the design of new drug molecules using molecular modelling software.

17061	***Cell and Molecular Biology (Elective Theory)***	**CO1.**	Understanding cell and molecular biology history, cellular structure its functioning, DNA properties and chemical foundation of cell biology.
		CO2.	Describing protein structure and its function, cellular membrane structure and function and basic molecular genetic mechanisms.
17062	***Cosmetic Science (Elective Theory)***	**CO1.**	Understanding concepts of cosmetics and cosmeceuticals.
		CO2.	Describing basic requirements for formulation and development of skin care, hair care, oral and dental care cosmetic products.
		CO3.	Discussing role of herbs in cosmetics analytical methods for shampoo, skin cream and toothpaste.
		CO4.	Illustrating principles of cosmetic evaluation.
17063	***Experimental Pharmacology (Elective Theory)***	**CO1.**	Recognising the applications of various commonly used laboratory animals.
		CO2.	Demonstrating various screening models used in preclinical research and importance of biostatistics and research methodology.
		CO3.	Designing and executing a research hypothesis independently.
17064	***Advanced Instrumentation Techniques (Elective Theory)***	**CO1.**	Understanding the fundamental working principles and its application of some advanced analytical instruments used in drug analysis.
		CO2.	Describing the principles of chromatographic separation and analysis of drugs.
		CO3.	Recognizing the calibration of various analytical instruments.
		CO4.	Reviewing analysis of drugs using various analytical instruments
17065	***Dietary Supplements and Nutraceuticals (Elective Theory)***	**CO1.**	Understanding the need of dietary supplements by the different group of people to maintain healthy life.
		CO2.	Explaining the outcome of deficiencies in dietary supplements.
		CO3.	Identifying the components in dietary supplements and their application.
		CO4.	Recognizing the regulatory and commercial aspects of dietary supplements including health claims.