



UTTARANCHAL UNIVERSITY

(Established vide Uttaranchal University Act, 2012, UGC Approved)

(Uttarakhand Act No. 11 of 2013)

Arcadia Grant, P.O. Chandanwari, Premnagar, Dehradun, Uttarakhand

UTTARANCHAL INSTITUTE OF PHARMACEUTICAL SCIENCES

College - UTTARANCHAL INSTITUTE OF PHARMACEUTICAL SCIENCES (UIPS)

Program- B. Pharm.

Programme Educational Objective (PEO's)

PEO 1	To produce graduates of the program with strong fundamental concepts in pharmaceutical sciences along with necessary skill set so as to increase inclination to become entrepreneur, pursue career/ higher studies and research.
PEO 2	To generate prospective knowledge pools with interpersonal, collaborative skills to identify, assess, formulate problems, and execute solutions and also to acquire professional manufacturing and research skills in making the pharmaceutical products, integrate critical thinking and providing services in health care system through research based outcome.
PEO 3	To inculcate in students ethical and professional attitude, multidisciplinary approach, strong communication skills and also leadership and entrepreneurship capabilities in future pharmacists.
PEO 4	To develop pharmacist to contribute effectively towards the social health care system and creating awareness about healthcare issues.
PEO 5	To develop awareness among students towards interdisciplinary and holistic approach in pharmaceuticals for social cause, problem solving and life-long learning.



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Program Specific Outcomes (PSO's)

PS0 1	Able to apply the in-depth knowledge of pharmaceuticals, cosmetology, pharmaceutical & medicinal chemistry, pharmacology, Pharmacognosy and other basic knowledge associated with pharmacy and allied sciences.
PS0 2	Able to choose multi-disciplinary career in pharmaceutical industry or institute or healthcare system.
PS0 3	Able to strengthen the professional and ethical approach, effective communication, team work, project skills and adopt in a globe of constantly developing trends.
PS0 4	Able to stream a self esteemed, lifelong career of personal and professional growth with ethical codes.

S.R.No	P.O.s	PO Details
PO1	Disciplinary Knowledge	Learn and acquire in depth knowledge and core scientific information regarding pharmaceuticals, cosmetology, pharmaceutical & medicinal chemistry, pharmacology, Pharmacognosy and other basic knowledge associated with pharmacy and allied sciences.
PO2	Problem Analysis and Critical Thinking	Learn and acquire in depth knowledge and core scientific information regarding pharmaceuticals, cosmetology, pharmaceutical & medicinal chemistry, pharmacology, Pharmacognosy and other basic knowledge associated with pharmacy and allied sciences.
PO3	Design/Development of Solutions	Design solutions using domain knowledge for complex pharmaceutical problems related to public health and safety, environment and society.
PO4	Conduct Investigations of Complex Problems	Apply research based knowledge including design of experiments, analysis and interpretation of data and synthesis of the information to find valid problems and the methodology to overcome.
PO5	Modern Tool Usage	Create, select and apply appropriate techniques, modern pharmaceutical tools, language simulation software, presentation skills, database management and equipment to analyze and solve problems.
PO6	Social Interaction	Understand the concept of community pharmacy and be able to participate in health care programs, create awareness about the effective and safe use of medicines.
PO7	Environment And Sustainability	Demonstrate the knowledge to develop a healthy, friendly and sustainable professional environment for continuous development providing better pharmacy related solutions to the society.
PO8	Ethics	Demonstrate knowledge of professional & ethical duties as per pharmaceutical jurisprudence and imbibe ethical principles and moral values in personal and professional endeavours. Demonstrate behaviour that recognizes cultural and personal variability in values, communication and lifestyles.
PO9	Individual And Team Work	Develop leadership skill in the diverse areas of profession, individual and team work capabilities, plan and implement professional activities. Acquire knowledge in order to execute responsibilities successfully towards developing expertise as per the needs of industry and academia, individually or in a team even in the multi-disciplinary arena.
PO10	Effective Communication	Develop an ability to write effective reports, make excellent presentations, and documentations, and communicate effectively, clear exchange of information with the pharmacy community and society.
PO11	Project Management And Finance	Demonstrate a knowledge & Understanding of project & finance management related to clinical, hospital, pharmacy practice and/or development of Active Pharmaceutical Ingredients & formulations within the pharmacy domain or with the multi-disciplinary environments.
PO12	Life-long Learning	Develop an aptitude for life-long learning and continuous professional development for a highly productive career and to tackle future challenges. Use self-assessment and feedback effectively, to identify



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learning needs and to satisfy them on an ongoing basis.

Course Outcomes (CO's)

Program- B. Pharm.

Course Name- Human Anatomy and Physiology I– Theory **Course Code-** BP101T

BP101T. CO1	Demonstrate competency in identifying the human body structure.
BP101T. CO2	Identify the various tissues and organs of different systems of human body.
BP101T. CO3	Compare and contrast the different parts of human tissue, organ and system.
BP101T. CO4	Diagrammatic representation of human organ and system.
BP101T. CO5	Estimate different components available in human tissue and body fluid.
BP101T. CO6	Recognize the major organs and vessels and understand the function of different human system.

Course Name- Pharmaceutical Analysis I – Theory

Course Code- BP102T

BP102T. CO1	Understand the importance of analytical chemistry and its scope.
BP102T. CO2	Describe various methods used for identification and estimation of compounds.
BP102T. CO3	Illustrate the importance of standardization of chemical substances and propose the assay of different drugs.
BP102T. CO4	Classify analytical errors and describe sources of impurities.
BP102T. CO5	Assess the instrumentation applicable in electrochemical method of analysis.
BP102T. CO6	Describe the concept of concentration, acid base theory, redox reaction and indicators.

Course Name- Pharmaceutics I – Theory

Course Code- BP103T

BP103T. CO1	Describe history of Pharmacy, development of pharmacy profession and industry in India.
BP103T. CO2	Understand the pharmaceutical dose calculation required for compounding and dispensing.
BP103T. CO3	Identify monophasic and biphasic liquids.
BP103T. CO4	Examine and classify pharmaceutical incompatibilities.
BP103T. CO5	Evaluate suppositories and semisolid dosage forms.

Course Name- Pharmaceutical Inorganic Chemistry – Theory **Course Code-** BP104T

BP104T. CO1	Understand sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals.
BP104T. CO2	Appraise the physical and chemical properties of inorganic compounds.
BP104T. CO3	Classify the different class of inorganic compounds.
BP104T. CO4	Describe the basic concept of acid base and physiological buffer system.
BP104T. CO5	Understand the procedure to perform specific test and limit test of inorganic medicinal compounds as per official pharmacopoeia.
BP104T. CO6	Describe the application of radiopharmaceutical substances and measurement.



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Course Name- Communication skills – Theory

Course Code- BP105T

BP105T. CO1	Understand the meaning and the process of effective communication along with its classification into various types.
BP105T. CO2	Comprehend the different elements and barriers to effective communication and develop ways to overcome the same.
BP105T. CO3	Construct clear concepts of writing, listening and speaking skills in English Communication.
BP105T. CO4	Acquire the knowledge of body language and presentation skill to communicate in interviews and professional situations.
BP105T. CO5	Understand the concept of teamwork, leadership and importance of personal development skills.

Course Name- Remedial Biology – Theory

Course Code- BP106RBT

BP106RBT. CO1	Compare the salient features of five kingdoms of life.
BP106RBT. CO2	Classify the basic components of plant anatomy and physiology.
BP106RBT. CO3	Compare the basic components of animal anatomy and physiology with special reference of human.
BP106RBT. CO4	Discuss the various components of living world.

Course Name- Remedial Mathematics – Theory

Course Code- BP106RMT

BP106RMT. CO1	Describe the concept of matrix. Definite and indefinite integral, derivatives and Laplace transform and its application in pharmacy.
BP106RMT. CO2	Applications of mathematical concepts and principles to perform computations for Pharmaceutical Sciences and research field in pharmacy.
BP106RMT. CO3	Create, use and analyze mathematical representations, mathematical relationships and Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy.
BP106RMT. CO4	Construct and develop basic tools that are employed in working out numerical problems in day-to-day operations in the labs, in the wards, in the community and related professional environments.
BP106RMT. CO5	The knowledge acquired in this subject will be useful in ensuing fields like pharmaceutical engineering and pharmaceutical analysis.

Course Name- Human Anatomy and Physiology – Practical

Course Code- BP107P

BP107P. CO1	Enumerate various components of body fluids.
BP107P. CO2	Compare micro and macroscopic data of human tissue.
BP107P. CO3	Determine the various biological processes.
BP107P. CO4	Illustrate bones and tissue on the basis of their structure and roles.



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Course Name- Pharmaceutical Analysis I – Practical

Course Code- BP108P

BP108P. CO1	Reproduce the calibration of glassware.
BP108P. CO2	Prepare the solution of different strength & standardization.
BP108P. CO3	Assess the assay of the drug by volumetric analysis.
BP108P. CO4	Assess the standardization by electrochemical analysis.

Course Name- Pharmaceutics I – Practical

Course Code- BP109P

BP109P. CO1	Demonstrate dosage forms of various pharmaceutical preparations.
BP109P. CO2	Examine preparation and formulation in relation to I.P
BP109P. CO3	Assess physical incompatibilities and methods to overcome them.
BP109P. CO4	Illustrate uses and storage of Pharmaceutical Preparation.

Course Name- Pharmaceutical Inorganic Chemistry – Practical Course Code- BP110P

BP110P. CO1	Discuss handling of glassware's and chemicals with safety precaution.
BP110P. CO2	Critique the identification of the organic compounds.
BP110P. CO3	Find out the limit of impurities in pharmaceutical substance.
BP110P. CO4	Produce the inorganic compounds in laboratory.

Course Name- Communication skills – Practical

Course Code- BP111P

BP111P. CO1	Develop linguistic competence through accuracy in grammar, pronunciation & vocabulary.
BP111P. CO2	Develop communication skills leading to effective and productive interaction in the areas of pharmaceutical operation.
BP111P. CO3	Enhance competence in both spoken & written language using a wide range of communication strategies.
BP111P. CO4	Listen and comprehend Spoken English and respond appropriately in different socio-cultural and professional contexts.
BP111P. CO5	Effectively use English Language and sharpen public speaking skills.
BP111P. CO6	Enhance the confidence of the students to face interviews, competitive examinations and day-to-day formal & informal communication situations.

Course Name- Remedial Biology – Practical

Course Code- BP112RBP

BP112RBP. CO1	Identify the various blood parameters for estimation.
BP112RBP. CO2	Compare the morphology of various parts of plants.
BP112RBP. CO3	Demonstrate the various techniques like section cutting, mounting, staining and preparation of permanent slides.
BP112RBP. CO4	Demonstrate the practicals by using computer models.



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Course Name-Human Anatomy and Physiology II – Theory Course Code- BP201T

BP201T. CO1	Understand the morphology, structure and functions of various organs of human body.
BP201T. CO2	Attain knowledge the various homeostatic mechanisms and their types in human body.
BP201T. CO3	Understand the various organ systems of human body.
BP201T. CO4	Detailed knowledge about hematological factors of human body.
BP201T. CO5	Known the coordination between various organs and organ systems.

Course Name-Pharmaceutical Organic Chemistry I – Theory Course Code- BP202T

BP202T. CO1	Interpret the IUPAC Nomenclature for organic compounds.
BP202T. CO2	Propose the reactivity and stability of organic compounds.
BP202T. CO3	Understand the orientation of reactions and naming of reactions.
BP202T. CO4	Classify the alcohols and their uses.
BP202T. CO5	Appraise the chemistry of aliphatic amines.
BP202T. CO6	Understand the carbonyl compounds and chemistry of various naming reactions.

Course Name-Biochemistry – Theory

Course Code- BP203T

BP203T. CO1	Understand the concept of bioenergetics and their significance.
BP203T. CO2	Understand Carbohydrates, lipids, proteins and nucleic acids
BP203T. CO3	Asses the knowledge of carbohydrate metabolism and related disease.
BP203T. CO4	Illustrate the importance of biological oxidation.
BP203T. CO5	Discuss about nucleic acid metabolism and genetic information, genetic code and translation of protein.
BP203T. CO6	Explore enzymes, their regulation, and biochemical functions.

Course Name-Pathophysiology – Theory

Course Code- BP204T

BP204T. CO1	Compare the etiology and pathogenesis of various diseased states.
BP204T. CO2	Assess the sign and symptoms of various diseases.
BP204T. CO3	Examine the complication of diseases.
BP204T. CO4	Recommend the prognosis of diseased conditions.
BP204T. CO5	Create a bridge between diagnosis and prognosis of diseases.



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Course Name-Computer Applications in Pharmacy – Theory Course Code- BP205T

BP205T. CO1	Test and examine different kinds of software for different medicines
BP205T. CO2	Create a database for pharmacy using Laboratory Information management System.
BP205T. CO3	Estimate the Impact of Bioinformatics in Vaccine Discovery.
BP205T. CO4	Create a website using CSS to demonstrate different diseases and medicine.
BP205T. CO5	Create Electronic Prescribing and discharge (EP) systems for patient

Course Name-Environmental Sciences – Theory

Course Code- BP206T

BP206T. CO1	Describe the concept of environment and environment studies.
BP206T. CO2	Explain about the natural resources problems associated with them and role of an individual in their conservation.
BP206T. CO3	Classify different types of ecosystems, their structure, functions and characteristics.
BP206T. CO4	Develop an attitude of concern for the environment.
BP206T. CO5	Create awareness about environment at problems among learners.

Course Name- Human Anatomy and Physiology II– Practical Course Code- BP207P

BP207P. CO1	Identify the various tissues and organs of different systems of human body.
BP207P. CO2	Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.
BP207P. CO3	Interlink organs and organ systems of human body.
BP207P. CO4	Understand the morphology of various organs of human body
BP207P. CO5	Understand the various blood groups found in humans and their confirmatory tests.

Course Name- Pharmaceutical Organic Chemistry I – Practical Course Code- BP208P

BP208P. CO1	Identify the organic compounds.
BP208P. CO2	Examine the elements present in organic compounds.
BP208P. CO3	Figure out the functional group present in the sample.
BP208P. CO4	Synthesize organic compounds in the laboratory.

Course Name- Biochemistry – Practical

Course Code- BP209P

BP209P. CO1	Analysis of carbohydrates, lipids and proteins in sample.
BP209P. CO2	Determination of blood sugar, creatinine and serum cholesterol level.
BP209P. CO3	Determination of salivary amylase activity and effect of temperature on its activity.
BP20P. CO4	Determine abnormal constituents present in urine sample.



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UTTARANCHAL INSTITUTE OF PHARMACEUTICAL SCIENCES

Course Name- Computer Application in Pharmacy- Practical Course Code- BP210P

BP210P.CO1	Apply various types of application of computers in pharmacy.
BP210P.CO2	Demonstrate the various types of databases.
BP210P.CO3	Apply the various applications of databases in pharmacy.
BP210P.CO4	Apply the web based tools for pharmacy practice.

Course Name-Pharmaceutical Organic Chemistry II – Theory Course Code- BP301T

BP301T.CO1	Synthesize organic compounds using general methods.
BP301T.CO2	Propose the mechanism and orientation regarding the reactions of some organic compounds.
BP301T.CO3	Illustrate the reactivity of organic compounds.
BP301T.CO4	Assess the chemistry of fats and oils.
BP301T.CO5	Appraise the chemistry of cycloalkanes and polynuclear hydrocarbons.
BP301T.CO6	Describe the knowledge about the electrophilic and nucleophilic reactions.

Course Name- Physical Pharmaceutics I – Theory

Course Code- BP302T

BP302T.CO1	Illustrate the various physico- chemical properties of drug molecules.
BP302T.CO2	Explain the principle of different process using various diagrams.
BP302T.CO3	Discuss the co-relation between in-situ and biological system.
BP302T.CO4	Assess various physicochemical properties and phenomena's used in pharmaceutical formulation.
BP302T.CO5	Co-relate complexation between drug and biological molecules.
BP302T.CO6	Collaborate various solution having different properties with biological system.

Course Name- Pharmaceutical Microbiology – Theory

Course Code- BP303T

BP303T.CO1	Describe the cell culture technology and estimate the importance of its application in pharmaceutical industries.
BP303T.CO2	Examine the sterility testing of pharmaceutical products.
BP303T.CO3	Figure out the methods of identification, cultivation and preservation of various microorganisms.
BP303T.CO4	Assess the importance and implementation of sterilization in pharmaceutical processing and industry.
BP303T.CO5	Verify the microbiological standardization of pharmaceuticals.

Course Name- Pharmaceutical Engineering – Theory

Course Code- BP304T

BP304T.CO1	Describe the mechanism & laws, theories and applications of unit operation in pharmaceutical manufacturing.
BP304T.CO2	Explain the principle, construction and working of equipment's used for handling, unit processes in pharmaceutical industries.

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BP304T.CO3	Illustrate the factors influencing the operating processes and fix optimum conditions for unit operation.
BP304T.CO4	Analyse the use of correct materials for construction of pharmaceutical plant.
BP304T.CO5	Assess the industrial hazards and safety measures could occur in industry.
BP304T.CO6	Formulate an overview regarding equipment selection used in unit operation during manufacturing.

Course Name-Pharmaceutical Organic Chemistry II –Practical Course Code- BP305P

BP305P.CO1	Produce the organic compounds in the lab.
BP305P.CO2	Qualify the purity of organic compounds.
BP305P.CO3	Examine the standardization of secondary standards.
BP305P.CO4	Interpret & report the analytical constant of fats and oils.

Course Name- Physical Pharmaceutics I – Practical Course Code- BP306P

BP306P.CO1	Performing various methods to identify physicochemical properties.
BP306P.CO2	Estimation of Physicochemical properties using different methods.
BP306P.CO3	Determination of various test parameters using different samples.
BP306P.CO4	Interpret the data collected from various test determination.

Course Name- Pharmaceutical Microbiology – Practical Course Code- BP307P

BP307P.CO1	Study the setup of different equipment and media preparation used in experimental microbiology.
BP307P.CO2	Assess the importance of various staining techniques.
BP307P.CO3	Examine the sterility testing of pharmaceutical products.
BP307P.CO4	Find out the various techniques used for culture and isolation.
BP307P.CO5	Assess the microbiological assays.

Course Name- Pharmaceutical Engineering – Practical Course Code- BP308P

BP308P.CO1	Demonstrate construction and working of equipment to be used.
BP308P.CO2	Calculate various pharmaceutical parameters using the equipment's.
BP308P.CO3	Analyze various factors that affect unit operation.
BP308P.CO4	Construct graphs and curves on various dependent or non-dependent variables.

Course Name- Communication skills – Theory Course Code- BP105TLE

BP105TLE.CO1	Understand the meaning and the process of effective communication along with its classification into various types.
BP105TLE.CO2	Comprehend the different elements and barriers to effective communication and develop ways to overcome the same.
BP105TLE.CO3	Construct clear concepts of writing, listening and speaking skills in English Communication.
BP105TLE.CO4	Acquire the knowledge of body language and presentation skill to communicate in interviews and professional situations.



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UTTARANCHAL INSTITUTE OF PHARMACEUTICAL SCIENCES

BP105TLE.CO5	Understand the concept of teamwork, leadership and importance of personal development skills.
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Course Name- Communication skills – Practical

Course Code- BP111PLE

BP111PLE.CO1	Develop linguistic competence through accuracy in grammar, pronunciation & vocabulary.
BP111PLE.CO2	Develop communication skills leading to effective and productive interaction in the areas of pharmaceutical operation.
BP111PLE.CO3	Enhance competence in both spoken & written language using a wide range of communication strategies.
BP111PLE.CO4	Ability to listen and comprehend Spoken English and respond appropriately in different socio-cultural and professional contexts.
BP111PLE.CO5	Effectively use English Language and sharpen public speaking skills.
BP111PLE.CO6	Enhance the confidence of the students to face interviews, competitive examinations and day-to-day formal & informal communication situations.

Course Name- Pharmaceutical Organic Chemistry III– Theory Course Code- BP401T

BP401T.CO1	Understand the methods of preparation and uses of organic compounds.
BP401T.CO2	Propose the mechanism and orientation regarding the reactions of prescribed organic compounds.
BP401T.CO3	Illustrate the reactivity of organic compounds.
BP401T.CO4	Assess the chemistry of Stereo isomerism.
BP401T.CO5	Discuss naming reactions.
BP401T.CO6	Describe the Hetero-cyclic compounds.

Course Name- Medicinal Chemistry I – Theory

Course Code- BP402T

BP402T.CO1	Classify the different classes of drugs with their structure.
BP402T.CO2	Assess the relation between physicochemical properties & biological action of drugs.
BP402T.CO3	Illustrate the structural activity relationship of selective classes of drugs.
BP402T.CO4	Appraise the synthesis of selective drugs.
BP402T.CO5	Criticize the mechanism and metabolic pathways of different class of drugs with their adverse effects.

Course Name- Physical Pharmaceutics II – Theory

Course Code- BP403T

BP403T.CO1	Classify dispersed system and explain colloidal and coarse dispersions.
BP403T.CO2	Describe rheology and related properties.
BP403T.CO3	Evaluate micromeretical properties of drugs and excipients.
BP403T.CO4	Assess drug stability of ingredients and formulations.



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Course Name- Pharmacology I – Theory Course Code- BP404T

BP404T.CO1	Understand the pharmacological actions of different categories of drugs.
BP404T.CO2	Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels.
BP404T.CO3	Apply the basic pharmacological knowledge in prevention & treatment of various diseases.
BP404T.CO4	Classify receptors and study of principles, site mechanisms & factors modifying drug actions.
BP404T.CO5	Employ the drugs acting on peripheral and central nervous system.
BP404T.CO6	Classify the various routes of administration with advantages and disadvantages.

Course Name-Pharmacognosy and Phytochemistry I– Theory Course Code- BP405T

BP405T.CO1	Illustrate the basics of Pharmacognosy, classification and system of medicines.
BP405T.CO2	Discuss cultivation, collection and quality control of crude drugs.
BP405T.CO3	Appraise the primary and secondary metabolites.
BP405T.CO4	Develop plant tissue culture and plant products.

Course Name- Medicinal Chemistry I – Practical Course Code- BP406P

BP406P.CO1	Generate the intermediates compounds.
BP406P.CO2	Produce the medicinal compounds in the lab.
BP406P.CO3	Assess the different physicochemical properties of drugs.
BP406P.CO4	Estimate the purity of drugs.

Course Name- Physical Pharmaceutics II – Practical Course Code- BP407P

BP407P.CO1	Determination of different physical attributes of ingredients.
BP407P.CO2	Conclude different properties of formulations.
BP407P.CO3	Practice of various viscometers and rate constants.
BP407P.CO4	Assess the stability of formulations.

Course Name- Pharmacology I – Practical Course Code- BP408P

BP408P.CO1	Demonstrate and handling of laboratory animals as per CPCSEA guidelines.
BP408P.CO2	Demonstration of different routes of drugs administration and techniques of blood removal in mice/rats.
BP408P.CO3	Study the effect of drugs on organs of experimental animals.
BP408P.CO4	Correlate the working of pharmacological equipments with the software's/videos.

Course Name- Pharmacognosy and Phytochemistry I – Practical Course Code- BP409P

BP409P.CO1	Examine the leaf constants of crude drugs.
BP409P.CO2	Assess the different chemical tests to analyze the specific crude drugs.

UTTARANCHAL INSTITUTE OF PHARMACEUTICAL SCIENCES

BP409P.CO3	Estimate various Macroscopic parameters.
BP409P.CO4	Estimate various physico-chemical parameters.

Course Name-Computer Applications in Pharmacy – Theory Course Code- BP205TLE

BP205TLE. CO1	Test and examine different kinds of software for different medicines.
BP205TLE. CO2	Create a database for pharmacy using Laboratory Information management System.
BP205TLE. CO3	Estimate the Impact of Bioinformatics in Vaccine Discovery.
BP205TLE. CO4	Create a website using CSS to demonstrate different diseases and medicine.
BP205TLE. CO5	Create Electronic Prescribing and discharge (EP) systems for patient.

Course Name- Computer Application in Pharmacy- Practical Course Code- BP210PLE

BP210PLE. CO1	Apply various types of application of computers in pharmacy.
BP210PLE. CO2	Demonstrate the various types of databases.
BP210PLE. CO3	Apply the various applications of databases in pharmacy.
BP210PLE. CO4	Apply the web based tools for pharmacy practice.

Course Name- Medicinal Chemistry II – Theory

Course Code- BP501T

BP501T.CO1	Understand the chemistry of drugs with respect to their pharmacological activity.
BP501T.CO2	Classify and mention the moa of drugs.
BP501T.CO3	Recognize important application of drugs for pharmacological action.
BP501T.CO4	Describe the pharmacokinetics of drugs.
BP501T.CO5	Accesses the SAR of drugs.
BP501T.CO6	Describe the synthesis of drugs.

Course Name- Industrial Pharmacy I– Theory

Course Code- BP502T

BP502T.CO1	Recall the concepts of dosage form design & formulation strategies.
BP502T.CO2	Assess the various factors affecting pharmaceutical dosage forms.
BP502T.CO3	Formulate solid, liquid and semisolid dosage forms.
BP502T.CO4	Explain sterile dosage forms and their Preparation.
BP502T.CO5	Analyze dosage form for various quality parameters.
BP502T.CO6	Illustrate packaging components, their types and specification.

Course Name- Pharmacology II – Theory

Course Code- BP503T

BP503T.CO1	Understand the signs and symptoms of various diseases.
BP503T.CO2	Understand the mechanism of drug action and its relevance in the treatment of different diseases.
BP503T.CO3	Discuss the various receptor actions.
BP503T.CO4	Access the various classes of drugs.
BP503T.CO5	Appraise the bio assays of drugs on isolated tissues.



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Course Name- Pharmacognosy and Phytochemistry II– Theory Course Code- BP504T

BP504T.CO1	Figure out metabolic pathway related to the formation of different secondary metabolites.
BP504T.CO2	Illustrate all Pharmacognostical evaluation including general introduction of secondary metabolites.
BP504T.CO3	Report the isolation, identification, analysis and industrial production of different phytoconstituents.
BP504T.CO4	Appraise the modern methods of extraction and application of latest techniques like spectroscopy, chromatography & electrophoresis in evaluation of crude drugs.

Course Name- Pharmaceutical Jurisprudence – Theory

Course Code- BP505T

BP505T.CO1	Enumerate pharmaceutical legislations and their implications.
BP505T.CO2	Illustrate various Indian Pharmaceutical Acts, Laws and Schedules.
BP505T.CO3	Understand the regulatory authorities and agencies governing the manufacture and sale of pharmaceutical products.
BP505T.CO4	Discuss code of ethics during the pharmaceutical practice.

Course Name- Industrial Pharmacy-I – Practical

Course Code- BP506P

BP506P.CO1	Analyze the packaging material used for pharmaceutical packagings.
BP506P.CO2	Asses' Preformulation concepts and their influence on stability.
BP506P CO3	Evaluate quality test of prepared formulations.
BP506P CO4	Formulate solid, liquid and semisolid dosage forms.

Course Name- Pharmacology II – Practical

Course Code- BP507P

BP507P.CO1	Prepare and learn the composition of various physiological salt solutions.
BP507P.CO2	Formulate the different dilutions of test drugs.
BP507P CO3	Illustrate the action of various drugs on isolated tissues.
BP507P CO4	Correlate the data and draw the inference.

Course Name- Pharmacognosy and Phytochemistry II –Practical Course Code- BP508P

BP508P.CO1	Assess the morphology, histology and powder characteristics of specific crude drugs.
BP508P.CO2	Examine the different chemical test to analyze the specific crude drugs.
BP508P CO3	Estimate the isolation and detection of active constituents present in crude drugs.
BP508P CO4	Estimate the various phytoconstituents by using specific separation methods.

Course Name- Medicinal Chemistry III – Theory Course Code- BP601T

BP601T.CO1	Classify the different classes of drugs with their structure.
BP601T. CO2	Illustrate the structural activity relationship & synthesis of selective classes of drugs.
BP601T. CO3	Criticize the mechanism and metabolic pathways of different class of drugs with their adverse effects.
BP601T. CO4	Acquire the detail knowledge of communicable disease.
BP601T. CO5	Compose the various approach in drug design.

Course Name- Pharmacology III – Theory

Course Code- BP602T

BP602T.CO1	Explain various drugs used for respiratory and gastrointestinal disorders
BP602T. CO2	Understand concepts of antiviral agents, anticancer agents, chemotherapy of parasitic diseases, Antifungal, Antimalarial, anthelmintics and chemotherapy of tuberculosis and leprosy.
BP602T. CO3	Describe the details of anticancer drugs and immunomodulatory drugs.
BP602T. CO4	Understand the basic concept in chemotherapy.
BP602T. CO5	Understand the toxicity profile of drugs.
BP602T. CO6	Develop knowledge about the chrono pharmacology.

Course Name- Herbal Drug Technology – Theory

Course Code- BP603T

BP603T.CO1	Describe the herbal cosmetics, natural sweeteners and Nutraceuticals.
BP603T. CO2	Appraise various regulatory guidelines for evaluation of herbal drugs.
BP603T. CO3	Design herbal drug product using plant materials as raw substance.
BP603T. CO4	Device the patenting of herbal products and good manufacturing practice (GMP).

Course Name- Biopharmaceutics and Pharmacokinetics –Theory Course Code- BP604T

BP604T.CO1	Understand the concepts of bioavailability and bioequivalence
BP604T. CO2	Illustrate the basic concepts of biopharmaceutics and pharmacokinetics and their significance.
BP604T. CO3	Compare the methods to enhance the dissolution rate and bioavailability of poorly soluble drugs.
BP604T. CO4	Calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism and excretion.
BP604T. CO5	Discuss non-linear pharmacokinetics with its significance.

Course Name- Pharmaceutical Biotechnology – Theory Course Code- BP605T

BP605T.CO1	Demonstrate the importance of biotechnology with reference to pharmaceutical sciences.
BP605T. CO2	Explain genetic engineering applications in relation to production of

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	pharmaceuticals.
BP605T. CO3	Illustrate the importance of immobilized enzymes and monoclonal antibodies in industries.
BP605T .CO4	Classify immunity and immune blotting techniques.
BP605T. CO5	Create awareness regarding new biological revolutions in diagnostic, prevention and cure of diseases.

Course Name- Quality Assurance –Theory

Course Code- BP606T

BP606T.CO1	Appraise the cGMP aspects in pharmaceutical industry.
BP606T. CO2	Recommend the importance of documentation.
BP606T. CO3	Support the scope of quality certification applicable to pharmaceutical industry.
BP606T. CO4	Assess the importance of QA & QC departments in pharmaceutical industry.
BP606T. CO5	Support the importance of regulatory affairs.

Course Name- Medicinal chemistry III – Practical

Course Code- BP607P

BP607P.CO1	Generate the intermediates compounds.
BP607P.CO2	Produce the medicinal compounds in the lab by conventional & microwave method.
BP607P. CO3	Estimate the purity of drugs.
BP607P. CO4	Produce the chemical structures and reactions by using chemdraw.

Course Name- Pharmacology III – Practical

Course Code- BP608P

BP608P.CO1	Develop practical and software skills in pharmacology lab.
BP608P.CO2	Understand the concept and methodology of different bioassays.
BP608P. CO3	Understand the concept of toxicology and OECD guidelines.
BP608P. CO4	Evaluation Drug absorption and mode of action of various drugs using software.

Course Name- Herbal Drug Technology – Practical

Course Code- BP609P

BP609P.CO1	Assemble the monograph of herbal drugs for preparations and documentation.
BP609P.CO2	Estimate the phytochemical screening and standardized the extract used in herbal formulations.
BP609P. CO3	Formulate herbal pharmaceuticals, cosmetics and their analysis.
BP609P. CO4	Examine the quantitative evaluations of herbal products.

Course Name- Instrumental Methods of Analysis – Theory

Course Code- BP701T

BP701T.CO1	Assess the existing knowledge, concepts, techniques, and methodology appropriate to the drug analysis.
BP701T. CO2	Perform quantitative & qualitative analysis of drugs using various analytical instruments.
BP701T. CO3	Appraise the interaction of matter with electromagnetic spectrum.



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BP701T.CO4	Device the handling of sophisticated instruments/equipments.
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Course Name- Industrial PharmacyII – Theory

Course Code- BP702T

BP702T.CO1	Describe the concept of pilot plant, the approval process and regulatory requirement for drug products.
BP702T.CO2	Discuss the current good manufacturing practices and Quality management system.
BP702T.CO3	Illustrate the process of technology transfer from lab to commercial scale.
BP702T.CO4	Prepare & arrange the check list of licensing documentation.

Course Name- Pharmacy Practice – Theory

Course Code- BP703T

BP703T.CO1	Survey the organization of hospital and hospital pharmacy.
BP703T.CO2	Identify and report ADR and drug interaction.
BP703T.CO3	Appraise the therapy of patient through medication and clinical review.
BP703T.CO4	Verify the patient condition by interviewing the medical history of patient.
BP703T.CO5	Identify and report the disease state by interpreting the laboratory results.
BP703T.CO6	Predict the dosing regimen by focusing on pharmacokinetics.

Course Name- Novel Drug Delivery System – Theory

Course Code- BP704T

BP704T.CO1	Illustrate the principles and technology used in the design of novel drug delivery systems.
BP704T.CO2	Assess the various approaches for development of novel drug delivery systems.
BP704T.CO3	Analyze the criteria for selection of drugs and polymers for development of novel drug delivery systems.
BP704T.CO4	Explain the formulation and characterization of different novel drug delivery systems.

Course Name- Instrumental Methods of Analysis – Practical

Course Code- BP705P

BP705P.CO1	Interpret the chemical compound present in any sample.
BP705P.CO2	Calculate the Assay of Drugs using spectroscopic techniques.
BP705P.CO3	Appraise the Separation of Drugs by chromatographic techniques.
BP705P.CO4	Demonstrate the sophisticated equipments and their working.

Course Name- Practice School

Course Code- BP706PS

BP706PS.CO1	Study monograph of a specific drug and adverse drug reactions.
BP706PS.CO2	Monitor drug therapy of patients through medication chart and clinical review.
BP706PS.CO3	Collection and interpretation of data obtained from medication history interview and patient counseling.
BP706PS.CO4	Interpretation of laboratory reports and do patient counseling in community pharmacy.



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UTTARANCHAL INSTITUTE OF PHARMACEUTICAL SCIENCES

Course Name- Biostatistics and Research Methodology

Course Code- BP801T

BP801T.CO1	Understand the basic concepts of biostatistics in pharmacy.
BP801T.CO2	Create and applications of statistical concepts and techniques to perform computations for Pharmaceutical Sciences and research field in pharmacy.
BP801T.CO3	Develop understanding on various kind of research, objectives of doing research, research process, research design and sampling in pharmaceutical sciences.
BP801T.CO4	Have adequate knowledge on measurement, scaling techniques, data analysis and hypothesis testing using suitable test of statistical significance.
BP801T.CO5	Statistical analysis using Excel, SPSS, Design of Experiment, R-software to industrial and clinical trial approach.

Course Name- Social and Preventive Pharmacy

Course Code- BP802T

BP802T.CO1	Modifying the health and hygiene for the prevent of diseases.
BP802T.CO2	Examining the current issues related to health and pharmaceutical problems with in the country and globally.
BP802T.CO3	Finding the alternative modes of thinking based on current healthcare development.
BP802T.CO4	Evaluating and comparing ways of solving problem related to health and pharmaceutical issues.
BP802T.CO5	Supporting the national healthcare programs and providing awareness.
BP802T.CO6	Design a better healthcare services.

Course Name- Pharma Marketing Management

Course Code- BP803ET

BP803ET.CO1	Describe the concept of pharmaceutical marketing.
BP803ET.CO2	Discuss the role and responsibility of professional sales representative.
BP803ET.CO3	Explain the different pharmaceutical consumer, their buying behavior and consumerism.
BP803ET.CO4	Discuss the various details and components of pharmaceutical product and their promotion.
BP803ET.CO5	Enumerate the concept of price management and the marketing channels in pharmaceutical industry.

Course Name- Pharmaceutical Regulatory Science

Course Code- BP804ET

BP804ET.CO1	Describe new drug discovery, clinical studies and generic drug product development.
BP804ET.CO2	Understanding of IND, NDA and ANDA.
BP804ET.CO3	Identify various procedures for export of pharmaceutical products.
BP804ET.CO4	Prepare clinical trial protocols along with its managing and monitoring.
BP804ET.CO5	Illustrate various laws and acts, use of Orange Book, Purple Book, Federal register.



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UTTARANCHAL INSTITUTE OF PHARMACEUTICAL SCIENCES

Course Name- Pharmacovigilance

Course Code- BP805ET

BP805ET.CO1	Describe the concept of Pharmacovigilance, ADRs detection and reporting and Regulatory terminologies.
BP805ET CO2	Illustrate the drug and disease classification, dictionaries, coding and terminologies used in Pharmacovigilance.
BP805ET CO3	Access the Vaccine safety surveillance, Pharmacovigilance methods and importance of communication in pharmacovigilance.
BP805ET CO4	Discuss the methods for evaluating data of different phases and enumerate ICH guidelines and their significance in Pharmacovigilance.

Course Name- Quality Control and Standardization of Herbal Course Code- BP806ET

BP806ET.CO1	Understand WHO guidelines for quality control of herbal drugs.
BP806ET. CO2	Illustrate the basic concepts of Quality assurance in herbal drug industry.
BP806ET .CO3	Examine the regulatory approval process and their registration in Indian and international markets.
BP806ET. CO4	Estimate ICH guidelines for quality control of herbal drugs.
BP806ET. CO5	Discuss cGMP GAP and GLP in traditional system of medicines.
BP806ET. CO6	Understand the preparation and development of herbal formulation.

Course Name- Computer Aided Drug Design

Course Code- BP807ET

BP807ET.CO1	Understand WHO guidelines for quality control of herbal drugs.
BP807ET. CO2	Illustrate the basic concepts of Quality assurance in herbal drug industry.
BP807ET. CO3	Examine the regulatory approval process and their registration in Indian and international markets.
BP807ET. CO4	Estimate ICH guidelines for quality control of herbal drugs.
BP807ET. CO5	Discuss cGMP GAP and GLP in traditional system of medicines.
BP807ET. CO6	Understand the preparation and development of herbal formulation.

Course Name- Cell and Molecular Biology

Course Code- BP808ET

BP808ET.CO1	Describe the Cell and Molecular Biology.
BP808ET. CO2	Understand the DNA and flow of molecular information.
BP808ET. CO3	Illustrate protein synthesis pathways and their significance.
BP808ET .CO4	Analyze basic molecular genetics mechanisms and Summarize the Cell Cycle and cell signals.

Course Name- Cosmetic Science

Course Code- BP809ET

BP809ET.CO1	Understand principles of formulation and building blocks of cosmeceutical products.
BP809ET. CO2	Summarize common problems associated with skin, hair and oral cavity.
BP809ET .CO3	Classify cosmetic and cosmeceutical product.
BP809ET .CO4	Analysis of individual cosmetic products.
BP809ET .CO5	Design and develop various cosmetic and cosmeceutical products.



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Arcadia Grant, P.O. Chandanwari, Premnagar, Dehradun, Uttarakhand

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Course Name- Experimental Pharmacology

Course Code- BP810ET

BP810ET.CO1	Describe the CPCSEA and OECD guidelines for the conduct of experiments on laboratory animals.
BP810ET.CO2	Appraise various the various screening methods used in preclinical research.
BP810ET.CO3	Illustrate the various preclinical screening models.
BP810ET.CO4	Analyse and interpret experimental data.

Course Name- Advanced Instrumentation Techniques

Course Code- BP811ET

BP811ET.CO1	Define Principle, Instrumentation and applications of instruments.
BP811ET.CO2	Understand the importance, components, Principle, methods and applications of Radio immuno assay.
BP811ET.CO3	Illustrate the Hyphenated techniques like LC-MS/MS, GC-MS/MS, HPTLC-MS.
BP811ET.CO4	Analyse and interpret experimental data.

Course Name- Dietary Supplements and Nutraceuticals

Course Code- BP812ET

BP812ET.CO1	Understand the need of supplements by the different group of people to maintain healthy life.
BP812ET.CO2	Understand the outcomes of deficiencies in dietary supplements.
BP812ET.CO3	Appreciate the components in dietary supplements and the application.
BP812ET.CO4	Appreciate the regulatory and commercial aspects of dietary supplements including health claims.

Course Name-Project Work

Course Code- BP813PW

BP813PW.CO1	Develops the communication and presentation skill.
BP813PW.CO2	Enhance skills and build confidence.
BP813PW.CO3	Learn to write thesis and research paper.
BP813PW.CO4	Understand about research methodology