Key Indicator:	2.6- Student Performance and Learning Outcome
2.6.1	**Teachers and students are aware of the stated programme and course outcomes of the programs offered by the institution.**
File Description	Cos for all courses

Key Indicator:	2.6- Student Performance and Learning Outcome
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File Description	Cos for all courses

TEACHERS AND STUDENTS ARE AWARE OF THE STATED PROGRAMME AND COURSE OUTCOMES OF THE PROGRAMS OFFERED BY THE INSTITUTION.

Sr. No.	Details of Documents
File Description	COS FOR ALL COURSES
1	B. PHARM SYALLBUS
2	M. PHARM SYALLBUS

Index Sr. No.: 1

B. Pharm New Syllabus

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COURSE OUTCOMES

Course code/ Course title	Courseoutcomes
BP101T Human Anatomy And Physiology-I (Theory)	The Students shall be able to: CO 1 Explain the gross morphology, structure and functions of various organs of the human body. CO 2 Describe the various homeostatic mechanisms and their imbalances. CO 3 Identify the various tissues and organs of different systems of human body. CO 4 Perform the various experiments related to special senses and nervous system. CO 5 Appreciate coordinated working pattern of different organs of each system
BP102T. Pharmaceutical Analysis (Theory)	The Students shall be able to: CO 1 understand the principles of volumetric and electro chemical analysis CO 2 carryout various volumetric and electrochemical titrations CO 3 develop analytical skills CO 4 Understand the handling of Indian Pharmacopoeial monographs CO 5 Understand the concept of errors
BP103T. Pharmaceutics- I (Theory)	The Students shall be able to: CO 1 Know the history of profession of pharmacy CO 2 Understand the basics of different dosage forms, pharmaceutical incompatibilities CO 3 Understand the professional way of handling the prescription CO 4 Preparation of various conventional dosage forms CO 5 Understand the basics of pharmaceutical calculations.
BP104T. Pharmaceutical Inorganic Chemistry (Theory)	The Students shall be able to: CO 1 know the sources of impurities CO 2 methods to determine the impurities in inorganic drugs and pharmaceuticals CO 3 understand the medicinal and pharmaceutical importance of inorganic compounds CO 4 Know General methods of preparation of some inorganic compounds CO 5 Know the basics of radiopharmaceuticals

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BP105T Communication Skills (Theory)	The Students should beable to: CO 1 Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation CO 2 Communicate effectively (Verbal and Non Verbal) CO 3 Effectivelymanage the team as a team player CO 4 Develop interview skills CO 5 Develop Leadership qualities and essentials
BP 106RBT. Remedial Biology (Theory)	The Students should beable to: CO 1 know the classification and salient features of five kingdoms of life CO 2 understand the basic components of anatomy & physiology of plant CO 3 know understand the basic components of anatomy & physiology animal with special reference to human CO 4 Know the basics of Plants and mineral nutrition CO 5 Know the basics of Plant growth and development
BP 106RMT. Remedial Mathematics (Theory)	The Students should beable to: CO 1 Know the theory and their application in Pharmacy CO 2 Solve the different types of problems by applying theory CO 3 Appreciate the important application of mathematics in Pharmacy CO 4 Know the basics of **Analytical Geometry** CO 5 Know the basics of **Laplace Transform**

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Course code/ Course title	Courseoutcomes
BP107P Human Anatomy And Physiology (Practical)	The Students shall be able to: CO 1 Know basics of compound microscope CO 2 Perform Microscopic study of various tissues. CO 3 Identify of bones of the human body CO 4 Enumerate of various blood cells count CO 5 Determine bleeding time, clotting time, Hb content, blood group CO 6 Determine heart rate, pulse rate and blood pressure
BP108P Pharmaceutical Analysis (Practical)	The Students shall be able to: CO 1 Perform the limit tests for various impurities CO 2 Perform Preparation and standardization of various reagents CO 3 Perform Assay of the various compounds along with Standardization of Titrant CO 4 Determine Normality by Conductometric titration CO 5 Determine Normality by Potentiometric titration
BP109P Pharmaceuticsi (Practical)	The Students shall be able to: CO 1 Prepare monophasic liquid dosage forms CO 2 Prepare Biphasic liquid dosage forms CO 3 Prepare Solid dosage forms CO 4 Prepare unit dosage forms CO 5 Prepare Semisolid forms and suppositories
BP110P Pharmaceutical Inorganic Chemistry (Practical)	The Students shall be able to: CO 1 Perform limit tests for various impurities CO 2 Perform Identification of various inorganic compounds CO 3 **Prepare inorganic pharmaceuticals** CO 4 Determine Swelling power of Bentonite CO 5 Determine Neutralizing capacity of aluminum hydroxide gel
BP111P Communication Skills (Practical)	The Students shall be able to: CO 1 Understand Basic communication including dos and donts CO 2 Pronounce Consonant Sounds and Vowel Sounds CO 3 Understand Figures of Speech CO 4 Develop Writing Skills and E-Mail etiquette CO 5 Develop Interview Handling Skills and Presentation Skills

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BP112RBP Remedial Biology (Practical)	The Students shall be able to: CO 1 Know basics of compound microscope CO 2 Perform Section cutting techniques, Mounting and staining, Permanent slide preparation CO 3 Understand Detailed study of frog by using computer models CO 4 Study of Stem, Root, Leaf, seed, fruit, flower and their modifications CO 5 Determine bleeding time, clotting time, Hb content, blood group CO 6 Determine blood group, blood pressure, tidal volume

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Course code/ Course title	Courseoutcomes
BP201T Human Anatomy And Physiology-Ii (Theory)	The Students shall be able to: CO 1 Explain the gross morphology, structure and functions of various organs of the human body. CO 2 Describe the various homeostatic mechanisms and their imbalances. CO 3 Identify the various tissues and organs of different systems of human body. CO 4 Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume. CO 5 Appreciate coordinated working pattern of different organs of each system
BP202T Pharmaceutical Organic Chemistry –I (Theory)	The Students shall be able to: CO 1 write the structure, name and the type of isomerism of the organic compound CO 2 write the reaction, name the reaction and orientation of reactions CO 3 account for reactivity/stability of compounds, CO 4 identify/confirm the identification of organic compound CO 5 Know General methods of preparation and reactions of organic compounds
BP203 T Biochemistry (Theory)	The Students shall be able to: CO 1 Understand the concept of Biomolecules and Bioenergetics CO 2 Understand the catalytic role of enzymes CO 3 Understand the importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes CO 4 Understand the metabolism of nutrient molecules in physiological and pathological conditions. CO 5 Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.
BP 204T Pathophysiology (Theory)	The Students shall be able to: CO 1 Understand Basic principles of Cell injury and Adaptation CO 2 Understand Basic mechanism involved in the process of inflammation and repair CO 3 Describe the etiology and pathogenesis of the selected disease states CO 4 Name the signs and symptoms of the diseases CO 5 Mention the complications of the diseases

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BP205 T Computer Applications In Pharmacy (Theory)	The Students should beable to: CO 1 Understand the basics of number systems CO 2 Understand Concept of Information Systems and Software CO 3 know the various types of application of computers in pharmacy CO 4 know the various types of databases CO 5 know the various applications of databases in pharmacy
BP 206 T Environmental Sciences (Theory)	The Students should beable to: CO 1 Create the awareness about environmental problems among learners. CO 2 Impart basic knowledge about the environment and its allied problems. CO 3 Motivate learner to participate in environment protection and environment improvement. CO 4 Acquire skills to help the concerned individuals in identifying and solving environmental problems. CO 5 Develop an attitude of concern for the environment and Strive to attain harmony with Nature.

Course code/ Course title	Courseoutcomes
BP 207 P Human Anatomy And Physiology (Practical)	The Students shall be able to: CO 1 Study the various system using specimens and models CO 2 demonstrate the general neurological examination CO 3 Examine the different types of taste. CO 4 demonstrate the reflex activity and visual activity CO 5 Demonstrate positive and negative feedback mechanism. CO 6 prepare permanent slides of vital organs and gonads.
BP208P Pharmaceutical Organic Chemistry -I (Practical)	The Students shall be able to: CO 1 Perform Systematic qualitative analysis of unknown organic compounds CO 2 Identify unknown compound from the literature usingmelting point/ boiling point. CO 3 Prepare the derivatives of unknown compounds CO 4 Prepare suitable solid derivatives from organic compounds CO 5 Construct molecular models

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BP 209 P Biochemistry (Practical)	The Students shall be able to: CO 1 Perform Qualitative analysis of carbohydrates, proteins, reducing sugars. CO 2 Perform Qualitative analysis of urine for abnormal constituents CO 3 Determine blood creatinine, blood sugar, serum total cholesterol CO 4 Prepare buffer solution and measurement of pH CO 5 Determine Salivary amylase activity and effect of temperature and substrate concentration.
BP210P Computer Applications In Pharmacy (Practical)	The Students shall be able to: CO 1 Design a questionnaire using a word processing package to gather information about a particular disease. CO 2 Create a HTML web page to show personal information CO 3 Create a database in MS Access to store the patient information with the required fields Using access CO 4 Design a form in MS Access to view, add, delete and modify the patient record in the database CO 5 Retrieve the information of a drug and its adverse effects using online tools.

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BP301T Pharmaceutical Organic Chemistry –Ii (Theory)	The Students shall be able to: CO 1 write the structure, name and the type of isomerism of the organic compound CO 2 write the reaction, name the reaction and orientation of reactions CO 3 Understand account for reactivity/stability of compounds, CO 4 prepare organic compounds
BP302T Physical Pharmaceutics-I (Theory)	The Students shall be able to: CO 1 Understand various physicochemical properties of drug molecules in the designing the dosage forms CO 2 Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations CO 3 Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
BP303T Pharmaceutical Microbiology (Theory)	The Students shall be able to: CO 1 Understand methods of identification, cultivation and preservation of various microorganisms CO 2 Understand the importance and implementation of sterlization in pharmaceutical processing and industry CO 3 Learn sterility testing of pharmaceutical products CO 4 Carried out microbiological standardization of Pharmaceuticals. CO 5 Understand the cell culture technology and its applications in pharmaceutical industries.
BP304T Pharmaceutical Engineering (Theory)	The Students shall be able to: CO 1 Know various unit operations used in Pharmaceutical industries. CO 2 Understand the material handling techniques. CO 3 Perform various processes involved in pharmaceutical manufacturing process. CO 4 Carry out various test to prevent environmental pollution. CO 5 Appreciate and comprehend significance of plant lay out design for optimum use of resources. CO6 Appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.

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Course code/ Course title	Courseoutcomes
BP 305 P Pharmaceutical Organic Chemistry -II (Practical)	The Students shall be able to: CO 1 Perform experiments involving Recrystallization CO 2 Perform experiments involving Steam distillation CO 3 Determine acid value including standardization of reagents CO 4 Determine Saponification value including standardization of reagents CO 5 Determine Iodine value including standardization of Reagents CO 6 Prepare various organic compounds
BP306P Physical Pharmaceutics – I (Practical)	The Students shall be able to: CO 1 Determine the solubility of drug at room temperature CO 2 Determine pKa value by Half Neutralization/ Henderson Hasselbalch equation. CO 3 Determine Partition co- efficient CO 4 Determine surface tension of given liquids by drop count and drop weight method CO 5 Determine HLB number, critical micellar concentration of surfactants
BP 307 P Pharmaceutical Microbiology (Practical)	The Students shall be able to: CO 1 Understand different equipments and processing, e.g., B.O.D. incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, refrigerator, microscopes used in experimental microbiology. CO 2 Perform Sterilization of glassware, preparation and sterilization of media. CO 3 Perform Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations. CO 4 Perform Simple, Grams staining and acid fast staining CO 5 Perform Isolation of pure culture of micro-organisms by multiple streak plate technique and other techniques. CO 6 Perform Microbiological assay of antibiotics by cup plate method and other methods CO 7 Perform Motility determination by Hanging drop method, Sterility testing of pharmaceuticals, Bacteriological analysis of water.

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BP308P Pharmaceutical Engineering (Practical))	The Students shall be able to: CO 1 Determine radiation constant of brass, iron, unpainted and painted glass, moisture content and loss on drying, overall heat transfer coefficient by heat exchanger. CO 2 Determine humidity of air – i) From wet and dry bulb temperatures –use of Dew point method. CO 3 Describe Construction working and application of Pharmaceutical Machinery such as rotary tablet machine, fluidized bed coater, fluid energy mill, de humidifier. CO 4 Perform size analysis by sieving and size reduction. CO 5 Understand the functioning of colloid mill, planetary mixer, fluidized bed dryer, freeze dryer and such other major equipment. CO 6 Understand Factors affecting Rate of Filtration and Evaporation, effect of time on the Rate of Crystallization.

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BP401T P'ceutical Organic Chemistry –III (Theory)	The Students shall be able to: CO 1 understand the methods of preparation and properties of organic compounds CO 2 explain the stereo chemical aspects of organic compounds and stereo chemical reactions CO 3 know the medicinal uses and other applications of organic compounds
BP402T. Medicinal Chemistry – I (Theory)	The Students shall be able to: CO 1 understand the chemistry of drugs with respect to their pharmacological activity CO 2 understand the drug metabolic pathways, adverse effect and therapeutic value of drugs CO 3 know the Structural Activity Relationship (SAR) of different class of drugs CO 4 write the chemical synthesis of some drugs
BP403T Physical Pharmaceutics-II (Theory)	The Students shall be able to: CO 1 Understand various physicochemical properties of drug molecules in the designing the dosage forms CO 2 Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations CO 3 Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
BP404T. Pharmacology-I (Theory)	The Students shall be able to: CO 1 Understand the pharmacological actions of different categories of drugs CO 2 Explain the mechanism of drug action at organ system/sub cellular/macromolecular levels. CO 3 Apply the basic pharmacological knowledge in the prevention and treatment of various diseases. CO 4 Observe the effect of drugs on animals by simulated experiments CO 5 Appreciate correlation of pharmacology with other bio medical sciences

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BP405T. Pharmacognosy And Phytochemistry I (Theory)	The Students shall be able to: CO 1 Know the techniques in the cultivation and production of crude drugs CO 2 Know the crude drugs, their uses and chemical nature CO 3 Know the evaluation techniques for the herbal drugs CO 4 Carry out the microscopic and morphological evaluation of crude drugs

Course code/ Course title	Courseoutcomes
BP 406 P. Medicinal Chemistry – I (Practical)	The Students shall be able to: CO 1 Prepare few drugs / intermediates like 1,3-pyrazole, Benzimidazole, Phenytoin etc CO 2 Perform Assay of few drugs like Chlorpromazine, Phenobarbitone, Ibuprofen etc CO 3 Determine of Partition coefficient for any two drugs
BP407P. Physical Pharmaceutics- II (Practical)	The Students shall be able to: CO 1 Determine particle size, particle size distribution using sieving method and Microscopic method CO 2 Determine bulk density, true density and porosity, angle of repose and influence of lubricant on angle of repose CO 3 Determine viscosity of liquid using Ostwald's viscometer CO 4 Determine sedimentation volume with effect of different suspending agent and with effect of different concentration of single suspending agent CO 5 Determine viscosity of semisolid by using Brookfield viscometer

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BP408P Pharmacology-I (Practical)	The Students shall be able to: CO 1 Understand experimental pharmacology, Commonly used instruments in experimental pharmacology, common laboratory animals, Maintenance of laboratory animals as per CPCSEA guidelines. CO 2 Understand Common laboratory techniques. Blood withdrawal, serum and plasma separation, anesthetics and euthanasia used for animal studies. CO 3 Know different routes of drugs administration in mice/rats. CO 4 Understand effect of hepatic microsomal enzyme inducers on the phenobarbitone sleeping time in mice. CO 5 Perform effect of drugs on ciliary motility of frog oesophagus, on rabbit eye as well as Effect of drugs on locomotor activity using actophotometer.
BP409P Pharmacognosy And Phytochemistry I (Practical)	The Students shall be able to: CO 1 Perform Analysis of few crude drugs by various chemical tests. CO 2 Determine stomatal number and index, vein islet number, vein islet termination and paliside ratio. CO 3 Determine size of starch grains, calcium oxalate crystals by eye piece micrometer CO 4 Determine Fiber length and width, number of starch grains by Lycopodium spore method CO 5 Determine Extractive values and moisture content of crude drugs

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BP501T. Medicinal Chemistry – II (Theory)	The Students shall be able to: CO 1 Understand the chemistry of drugs with respect to their pharmacological activity CO 2 Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs CO 3 Know the Structural Activity Relationship of different class of drugs CO 4 Study the chemical synthesis of selected drugs
BP 502 T. Industrial PharmacyI (Theory)	The Students shall be able to: CO 1 Know the various pharmaceutical dosage forms and their manufacturing techniques. CO 2 Know various considerations in development of pharmaceutical dosage forms CO 3 Formulate solid, liquid and semisolid dosage forms and evaluate them for their
BP503.T. Pharmacology-II (Theory)	The Students shall be able to: CO 1 Understand the mechanism of drug action and its relevance in the treatment of different diseases CO 2 Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments CO 3 Demonstrate the various receptor actions using isolated tissue preparation CO 4 Appreciate correlation of pharmacology with related medical sciences
BP504 T. Pharmacognosy And Phytochemistry II (Theory)	The Students shall be able to: CO 1 to know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents CO 2 to understand the preparation and development of herbal formulation. CO 3 to understand the herbal drug interactions CO 4 to carryout isolation and identification of phytoconstituents

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BP 505 T. Pharmaceutical Jurisprudence (Theory)	The Students shall be able to understand: CO 1 The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals CO 2 Various Indian pharmaceutical Acts and Laws CO 3 The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals CO 4 The code of ethics during the pharmaceutical practice

Course code/ Course title	Courseoutcomes
BP 506 P. Industrial PharmacyI (Practical)	The Students shall be able to: CO 1 Understand Preformulation studies of any Drug substance. CO 2 perform Preparation and evaluation of Tablet and Capsules CO 3 Perform Preparation of Injections and ophthalmic products. CO 4 Perform preparation of various cosmetics. CO 5 perform Quality Control test for Tablet and capsules CO 6 perform Evaluation of various Packaging Materials
BP 507 P. Pharmacology-II (Practical)	The Students shall be able to: CO 1 Use experimental animals and tissues derived from them in pharmacological screening and evaluations of drugs CO 2 Perform Simulated experiment of study of various effects of drugs on isolated frog heart using suitable software CO 3 Handle Equipment's used in isolated tissue experiments & various physiological salt solutions used in experimental pharmacology. CO 4 Perform Simulated experiment of recording of dose response curve of acetyl choline/ histamine on rat/ guinea pig ileum or rat ileum OR goat trachea OR chicken ileum using suitable software CO 5 Perform the various drug effect on animals by using software

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BP 508 P. Pharmacognosy . And Phytochemistry II (Practical)	The Students shall be able to: CO 1 Study Morphology, histology and powder characteristics & extraction of crude drugs. CO 2 perform isolation & detection of active principles from crude drugs. CO 3 Perform Separation of sugars by Paper chromatography CO 4 Perform TLC of herbal extract CO 5 Perform Distillation of volatile oils and detection of phyto constitutents by TLC CO 6 Perform Analysis of crude drugs by chemical tests

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BP601T. Medicinal Chemistry – III (Theory)	The Students shall be able to: CO 1 Understand the importance of drug design and different techniques of drug design. CO 2 Understand the chemistry of drugs with respect to their biological activity. CO 3 Know the metabolism, adverse effects and therapeutic value of drugs. CO 4 Know the importance of SAR of drugs
BP602 T. Pharmacology-III (Theory)	The Students shall be able to: CO 1 understand the mechanism of drug action and its relevance in the treatment of different infectious diseases CO 2 comprehend the principles of toxicology and treatment of various poisoning CO 3 appreciate correlation of pharmacology with related medical sciences
BP 603 T. Herbal Drug Technology (Theory)	The Students shall be able to: CO 1 understand raw material as source of herbal drugs from cultivation to herbal drug product CO 2 know the WHO and ICH guidelines for evaluation of herbal drugs CO 3 know the herbal cosmetics, natural sweeteners, nutraceuticals CO 4 appreciate patenting of herbal drugs, GMP
BP 604 T. Biopharmaceutics And Pharmacokinetics (Theory)	The Students shall be able to: CO 1 Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance CO 2 Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination. CO 3 To understand the concepts of bioavailability and bioequivalence of drug products and their significance CO 4 Understand various pharmacokinetic parameters, their significance & applications.

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BP 605 T. Pharmaceutical Biotechnology (Theory)	The Students shall be able to understand: CO 1 Importance of Immobilized enzymes in Pharmaceutical Industries CO 2 Genetic engineering applications in relation to production of pharmaceuticals CO 3 Importance of Monoclonal antibodies in Industries CO 4 Appreciate the use of microorganisms in fermentation technology
BP606T Pharmaceutical Quality Assurance (Theory)	The Students shall be able to: CO 1 understand the cGMP aspects in a pharmaceutical industry CO 2 appreciate the importance of documentation. CO 3 understand the scope of quality certifications applicable to pharmaceutical industries CO 4 understand the responsibilities of QA & QC departments.

Course code/ Course title	Courseoutcomes
BP607P. Medicinal Chemistry- III (Practical)	The Students shall be able to: CO 1 prepare drugs and their intermediates CO 2 perform assay of drugs CO 3 prepare medicinally important compounds by microwave irradiation technique CO 4 draw structures and reactions using chem draw. CO 5 determine physicochemical properties for class of drugs course contents using drug design software
BP 608 P. Pharmacology-III (Practical)	The Students shall be able to: CO 1 Understand the Dose calculation in pharmacological experiments CO 2 Study the effects of various drugs on experimental models CO 3 study the acute toxicity effect CO 4 study acute skin and eye irritation / corrosion of a test substance CO 5 study Biostatistics methods in experimental pharmacology

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BP 609 P. Herbal Drug Technology (Practical)	The Students shall be able to: CO 1 perform preliminary phytochemical screening of herbal drugs CO 2 perform determination of alcohol content. CO 3 perform evaluation of herbal excipients CO 4 perform Preparation and standardisation of herbal cosmetics and formulations CO 5 perform Monograph analysis CO 6 perform Determination of content in herbal drugs

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Course code/ Course title	Course outcomes
BP701T. Instrumental Methods Of Analysis (Theory))	The Students shall be able to: CO 1 Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis CO 2 Understand the chromatographic separation and analysis of drugs. CO 3 Perform quantitative & qualitative analysis of drugs using various analytical
BP 702 T. Industrial Pharmacy II (Theory)	The Students shall be able to: CO 1 Know the process of pilot plant and scale up of pharmaceutical dosage forms CO 2 Understand the process of technology transfer from lab scale to commercial batch CO 3 Know different Laws and Acts that regulate pharmaceutical industry CO 4 Understand the approval process and regulatory requirements for drug products
BP 703T. Pharmacy Practice (Theory)	The Students shall be able to: CO 1 know various drug distribution methods in a hospital CO 2 appreciate the pharmacy stores management and inventory control CO 3 monitor drug therapy of patient through medication chart review and clinical CO 4 obtain medication history interview and counsel the patients CO 5 identify drug related problems detect and assess adverse drug reactions
BP 704T Novel Drug Delivery Systems (Theory)	The Students shall be able to: CO 1 Understand selection of drug, polymer, formulation and evaluation of controlled drug delivery system CO 2 Understand selection of drug, polymer, formulation and evaluation of Mucosal and implantable drug delivery system CO 3 Understand selection of drug, polymer, formulation and evaluation of transdermal, gastroretentive and nasopulmonary drug delivery system CO 4 Understand selection of drug, polymer, formulation and evaluation of targeted drug delivery system CO 5 Understand selection of drug, polymer, formulation and evaluation of ocular intrauterine drug delivery system

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BP705P. Instrumental Methods Of Analysis (Practical)	The Students shall be able to: CO 1 identify sample by ascending paper chromatography CO 2 perform identification of sample by radial paper chromatography and thin layer chromatography CO 3 calibrate visible spectrophotometer or colorimeter and determine λ max of drug CO 4 perform colorimetric analysis of excipients/finished products CO 5 determine quinine sulphate/riboflavin using fluorimeter

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Course code/ Course title	Course outcomes
BP801T. Biostatisitcs And Research Methodology (Theory)	The Students shall be able to: CO 1 Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment) CO 2 Know the various statistical techniques to solve statistical problems CO 3 Appreciate statistical techniques in solving the problems
BP 802T Social And Preventive Pharmacy	The Students shall be able to: CO 1 Acquire high consciousness/realization of current issuesrelated to health and pharmaceutical problems within the country and worldwide. CO 2 Have a critical way of thinking based on current healthcare development CO 3 Evaluate alternative ways of solving problems related tohealth and pharmaceutical issues
BP804 ET Pharmaceutical Regulatory Science (Theory)	The Students shall be able to: CO 1 Know about the process of drug discovery and development CO 2 Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals CO 3 Know the regulatory approval process and their registration in Indian and international markets
BP 806 ET Quality Control And Standardization Of Herbals (Theory)	The Students shall be able to: CO 1 know WHO guidelines for quality control of herbal drugs CO 2 know Quality assurance in herbal drug industry CO 3 know the regulatory approval process and their registration in Indian and international markets CO 4 appreciate EU and ICH guidelines for quality control of herbal drugs

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- Course Outcomes according to North Maharashtra University Syllabus for Final Year B Pharmacy of 2019-2020 batch

Course code/ Course title	Course outcomes
T.4.7.1 Pharmaceutical Technology – II(Pharmaceutics-VIII)	The students shall be able to: CO 1 General understanding regarding Parenteral preparation. CO 2 Design facilities and environmental control of parenterals CO 3 To know about formulation of ophthalmic preparation CO 4 Understand drug stability studies and methods of stability studies of pharmaceutical formulations. CO 5 knowledge regarding oral sustained and controlled release drug delivery systems CO 6 Use of polymers in dosage form design and information of microencapsulation with optimization of dosage forms.
T.4.7.2 Pharmaceutical Chemistry –VIII (Medicinal Chemistry-III)	The students shall be able to: CO 1 To understand classification and SAR of sedatives and hypnotics anticonvulsant. CO 2 Knowledge about physicochemical properties,MOA and synthesis of Antidipressants and antiparkinsons. CO 3 To understand general Anesthetics and local anesthetics and MOA CO 4 Knowledge regarding drugs for Alzheimer's diseasesand Antiviral agents including HIV CO 5 Detail information and structure ,SAR of Vitamins and related compounds,CNS stimulants
T. 4.7.3 Pharmacology-III	The students shall be able to: CO 1 Knowledge regarding types and pharmacology of drugs utilizes in Cardiovascular system. CO 2 To understands bioassay and its methods CO 3 To study immunosuppressant and immunostimulants CO 4 Introduction and molecular basis of chemotherapy CO 5 Knowledge about Chemotherapy of Cancer, T.B., leprosy.

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T.4.7.4 Pharmaceutical Analysis-III	The Students shall be able to: CO 1 Understand the basic concept related to Chromatography and its types CO 2 To know principal instrumentations of electrophoresis and its developments CO 3 Radioimmuno assay and related immune assay techniques CO 4 To know basic concept in Spectroscopy like electromagnetic radiations, wavelength, wave number and frequency CO 5 Knowledge and mechamism of UV-visible spectroscopy,fluroscence spectroscopy CO 6 Factors affecting to atomic emission and atomic spectrophotometry.
T.4.7.5 Pharmaceutical biotechnology	The Students should beable to: CO 1 Defination ,scope and potential of biotechnology. CO 2 Fermentation technology and industrial microbiology CO 3 Introduction ,types and applications of animal cell culture. CO 4 Know about genetic recombinations of animal cells CO 5 Understands biotechnological production of human insulin,human growth harmone and interference. CO 6 To study principal and applications of blotting techniques like polymer chain reactions and ELIZA.
T.4.7.6 Pharmaceutical industrial management	The students be able to : CO 1 To study introduction planning and forecasting of management CO 2 To know organization and communication CO 3 To study **Leadership and Motivation** CO4 To knowledge general agreement on tariff and trade CO 5 World trade organization and trade related Intellectual property rights CO 6 Quality Assurance and statistical quality control

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Course code/ Course title	Course outcomes
P.4.7.1 Pharmaceutical Technology – II(Pharmaceutics-VIII)	The Students shall be able to: CO 1 General understanding regarding Parenteral preparation. CO 2 To prepare and evaluation of ampoule containing SWFI and different injections CO 3 Introduction of ophthalmic products CO 4 To prepare and evaluate eye drops like zinc sulphate,sulphacetamide and eye ointment like like chloramphenicol and sulphacetamide CO 5 To perform test like powered glass test,water attack test CO 6 To evaluate plastic containers ,rubber closures, glass containers containing parenteral products
P.4.7.2 Pharmaceutical Chemistry –VIII (Medicinal Chemistry-III)	The Students shall be able to: CO 1 Purification techniques of solvents /liquid by fractional distillation under vaccume. CO 2 Various synthesis like benzil from benzoin,hydantoin from benzil. CO 3 To prepare isonicotinic acid, CO 4 Cyclazation reaction like 2- Phenyl endole. CO 5 Esterification like synthesis of N-butyl acetate from N-butanoland acetic acid
P. 4.7.3 Pharmacology-III	The Students shall be able to: CO 1 T-test for comparing different in means between groups student's test CO 2 To case presentation for any one non communicable and one communicable diseases CO 3 Calculation of sample size using any free online software package and concept of randomization CO 4 To determine Na+ and K + Concentrations in urine samples using flamephotometry or any other sutaible technique. CO 5 To study DNA electophorosis or protein electrophoresis using free extracted sampless.

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P.4.7.4 Pharmaceutical Analysis-III	The Students shall be able to: CO 1 To identify sample by ascending paper chromatography CO 2 To study identification of sample by radial paper chromatography and thin layer chromatography CO 3 To calibrate visible spectrophotometer or colorimeter and determine λ max of drug CO 4 To know colorimetric analysis of excipients/finished products CO 5 To determine quinine sulphate/riboflavin using fluorimeter CO 6 Demonstration of H.P.T.L.C.

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Course code/ Course title	Course outcomes
T.4.8.1 Pharmaceutics -IX	The Students shall be able to: CO 1 To introduce targeted drug delivery system and Occular drug delivery system CO 2 To study in detail transdermal drug delivery system CO 3 To know gastroretentive drug delivery system and its evaluation techniques. CO 4 To understand colon specific drug delivery system and mucosal drug delivery system. CO 5 Knowledge about pulmonary and nasal drug delivery system. CO 6 To study physiology and development of intrauterine and intravaginal drug delivery.
T.4.8.2 Pharmaceutical Analysis-IV	The Students shall be able to: CO 1 To study in detail column and gas chromatography CO 2 Detail knowledge about HPLC. CO 3 Know estimation from Ion exchange and ion pair chromatography,gel permeation chromatography and flash chromatography CO 4 Interfeces and applications of hyphenated techniques GCMS and LCMS CO 5 Detail knowledge regarding Infra-red spectroscopy,NMR spectroscopy and Mass spectroscopy CO 6 Structural elucidation problems based on IR,NMR and Mass spectroscopy.
T. 4.8.3 Pharmaceutical Chemistry-IX(Medicinal Chemistry-IV)	The Students shall be able to: CO 1 Quantitative approaches to structure activity relationship and designing prodrugs,bioprecursors. CO 2 To study diruetics and steroids CO 3 To get knowledge regarding anti histaminics,antiemitics,anti ulcer drugs and analgesics. CO 4 Introduction of NSAIDS like aspirin ,paracetamol,Ibuprofen CO 5 Knowledge about hypoglysemics and its classification.

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T.4.8.4 Pharmacognosy-VI	The Students shall be able to: CO 1 World –wide trade in medicinal plants and their derived products CO 2 To know A brief account of plant based industries and institutions involved in work on medicinal and aromatic plants in India. CO 3 To study Arromatic plants in Indian trade. CO 4 Understands phytocosmetics and industrial significants CO 5 To study quality control and standardization of herbal drugs. CO 6 To know global regulatory status and patenting of herbal medicines.
T.4.8.5 Pharmacology IV(Clinical pharmacy and drug interactions)	The Students should beable to: CO 1 To introduce drug development process and drug interactions. CO 2 Drug induced disease and therapeutic monitoring CO 3 Introduction of adverse reaction monitoring and pharmacovigilence. CO 4 Different drug medication errors CO 5 Drug utilization and evaluationand essential and rational drug use. CO 6 To study of pharmacoeconomics and pharmaco-epidemiology.
T.4.8.6 Pharma-marketing **(Elective)**	The students be able to : CO 1 To know meaning ,concepts ,importance and emerging trends in marketing CO 2 Product decision its classification,productport folio analysis and new product decision. CO 3 To study Importance ,objectives and determinants of prize in pricing CO4 To introduce pharmaceutical marketing challenges CO 5 To know about promotion its meaning and methods CO 6 Strategic marketing planning ,marketing implenitation and its evaluation

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Course code/ Course title	Course outcomes
P.4.8.1 Pharmaceutics-IX	The Students shall be able to: CO 1 Introduction of novel drug delivery system. CO 2 Formulation and evaluation of nano particle by suitable technique CO 3 Formulation and evaluation of ocular inserts ,trandermal patch and floating tablets CO 4 Dissolution study of marketed sustained release tablets and marketed enteric coated tablets. CO 5 Rheological study of gels and viscosity determinations CO 6 Effect of concentration of effervescent agents on floating lag time.
P.4.8.2 Pharmaceutical Analysis -IV	The Students shall be able to: CO 1 To calibrate UV-spectrophotometer and determination of λ max of drug. CO 2 UV-spectrophotometric analysis of raw materials/finished products. CO 3 To determine the effect of pH upon the Absorption spectrum of sulphanilamide, CO 4 To know assay of caffeine and sodium benzoate inj. By simultenious equation method and absorbance ratio method CO 5 H.P.L.C. demonstration CO 6 To determine the structure of compound by F.T.I.R
P. 4.8.3 Pharmaceutical Chemistry-IX(Medicinal Chemistry-IV)	The Students shall be able to: CO 1 To determine partition coefficient dissociation constant and molar refractivity of compound from QSAR analysis (Demonstration) CO 2 To synthesize methyl salicylate,Paracetamol and phenacetin CO 3 To study synthesis of aspirin,acetyl glycine, CO 4 To synthesize para methyl acetophenone . CO 5 Synthesis of benzanilide from benzophenone and M-nitro phenol from m-nitro aniline
P.4.8.4 Pharmacognosy-VI	The Students shall be able to: CO 1 To isolate sum selected phytoconstituents studied in theory CO 2 Analysis of volatile oils and their chromatographic profiles CO 3 To prepare herbal skin and hair care cosmetics CO 4 To standardize herbal crude drug and extract by physical and chemical parameters CO 5 To prepare and standersize different herbal formulations

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M.Pharm Syllabus

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COURSE OUTCOMES:

M.Pharm (PCI new Syllabus)

Course code/Course Title	Course Outcomes	Bloom level
M.Pharm (Quality Assurance) Sem-I)		
On successful completion of the course, the students will be able to		
Modem Pharmaceutical Analytical Techniques (MQA101T)	The student should able to CO1: Understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analytical instruments such as UV-Visible, IR" and Spechroflourimetry etc. CO2: Develop basic practical skills using instrumentation techniques CO3: Expand the theoretical krowledge on principle, theory ard [nsfiumentation of Mass Spectroscopy CO4: Skills in selecting the suitable chromatographic techniques for separations of drugs and pharmaceuticals. CO5: To apply the knowledge learning in developing new procedures of their own design CO6: Comparing various m€ftods ofanalysis and their outcomes such as RIA Radio Immuno Assav). ELISA .Bioluminescence assays	Understanding Relating Creating
Quality Management Systems (MQA l02T)	The student should able to CO1: Study the various approaches for the importance of quality as a strategic decision. CO2: Understand about the Tools for quality improvement. Co3: To study the various statistical approaches for quality. CO4: To study the ISO management system. Quality control and Quality Assurance	Understanding Relating
Quality Control and Quality Assurance .(MQA 103T)	The student should able to CO1: Understand the CGMP aspects in a pharmaceutical industry. CO2: Undented the scope of quality certification applicable to Pharmaceutical industries	Understanding Creating Transferring

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	CO3: Understand the responsibilities of QA & QC departments. CO4: Appreciate the importance of documentation. CO5: study the Indusial Management and GMP c8nsiderations.	
Product Development and Technology/ Tranter (MQA 104T)	The student should able to CO1: Understand the necessary information to transfer. technology,_ from R&D to manufacturing by sorting out various information obtained during R&D CO2: Understand the new product development process CO3: Elucidate necessary information to transfer technology of existing products between various manufacturing places	Understanding Transferring
Quality Assurance Practical - I (MQA 105P)	The student should able to CO1: Perform Experiments based on IIPLC. CO2: Explain the case studies on Total Quality Management Six Sigma Change Management / Charge control. Deviations. CO3: Underhand simultaneous estimation of multi component containing formulations by UV Spectrophotometry. CO4: Study the Development of Stability study protocol. CO5: Study the Accelerated Liability studies.	Understanding Judging Transferring

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M.Pharm (Quality Assurance) (Sem-II)		
On successful completion of the course, the students will be able to		
Hazards and Safety Management MQA201T	The student should able to CO1: Ensure safety standards in pharmaceutical industry. CO2: Understand Impart basic knowledge about the environment and its allied problems CO3: Teach the method of Hazard assessment provide safe industrial atmosphere.	Understanding
Pharmaceutical Validation (MQA 202T)	The student should able to Col: To Understand the various equipment's and instruments CO2: Explain validation of analytical method for estimation of drugs CO3: Know Process 1'alidation of different dosage forms.	Understanding Analysis Transferring
Audits and Regulatory Compliance (MPA 203T)	The student should able to COI: Understand the importance of auditing. CO2r Understand the methodology of auditing. CO3: Car{y ort the audit process. CO4: Prepare the auditing report	Understanding Analysis Transferring
Pharmaceutical Manufacturing Technology (MQA 204T)	The student should able to CO1: Understand the common practice in the pharmaceutical industry Development plant layout and production planning. CO2: Explain principles and practices of aseptic process technology. don-sterile manufacturing technology and packaging technology- CO3: Understanding of principles and implementation of Quality by design (QbD) and process analytical technology (PAT) in pharmaceutical manufacturing	Understanding
Quality Assurance Practical -II (MQA 205P)	The student should able to CO1: Perform Organic contaminants .residue analysis by HPLC. CO2: Analyse Validation of an analytical method for a drug. CO3: I understand Cleaning validation of equipment's CO4 : Explain Case study on application of QbD.	Understanding Analysis

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M Pharm Second Year Third Semester		
Research Methodology & biostatistics (MRM 301T)	The student should able to CO1: Understand general Research Methodology Its objective, Requirements, practical difficulties, review of literature, study design. CO2: Understand Biostatistics its Definition applications, sample size, Importance of sample size, factor influencing sample size dropouts. CO3: Know about Medical Research its History, values in medical .ethics, autonomy), beneficence, non-maleficence, double effect conflicts between, autonomy and beneficence /non-maleficence. CO4: : Know about CPCSEA guidelines for laboratory animal facility its Goals, veterinary care, quarantine surveillance. CO5: Understand Declaration of Helsinki its History. Introduction , basic, principles for all medical research	Understanding Transferring

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COURSE OUTCOMES:
M.Pharm (PCI new Syllabus)

Course code/ Course Title	Course Outcomes	Bloom level
M.Pharm (Pharmaceutics) (Sem-I)		
On successful completion of the course, the students will be able to		
MPH 101TMODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	T-1 To Know Chemicals and Excipients	Understanding
	T-2 The analysis of various drugs in single and combination dosage forms	Relating
	T-3 Theoretical and practical skills of the instruments	Creating
MPH 102T DRUG DELIVERY SYSTEMS	T-1 To Understand The various approaches for development of novel drug delivery systems.	Understanding
	T-2 The criteria for selection of drugs and polymers for the development of delivering system	Understanding
	T-3 The formulation and evaluation of Novel drug delivery systems	Relating
MPH 103T MODERN PHARMACEUTICS	T-1 To Understand The elements of preformulation studies.	Understanding
	T-2 The Active Pharmaceutical Ingredients and Generic drugProduct development	Creating
	T-3 Industrial Management and GMP Considerations	Understanding
	T-4 Optimization Techniques & Pilot Plant Scale Up Techniques	Understanding
	Stability Testing, sterilization process & packaging of dosage forms	Transferring
MPH 104T REGULATORY AFFAIRS	T-1 To Understand The Concepts of innovator and generic drugs, drug development process	Understanding
	T-2 The Regulatory guidance and guidelines for filing andapproval process	Understanding
	T-3 Preparation of Dossiers and their submission to regulatory agencies in different countries	Transferring
	T-4 Post approval regulatory requirements for actives and drug products Submission of global documents in CTD/ eCTDformats	Understanding

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	T-5 Clinical trials requirements for approvals for conducting clinical trials Pharmacovigilence and process of monitoring in clinical trials.	Understanding
MPH 105P PHARMACEUTICS PRACTICALS - I	P-1 Understand Formulation and evaluation of sustained release and controlled release formulations	Understanding / Judging
	P-2 Study the principles of UV, HPLC, Gas Chromatography and flame photometry	Transferring
	P-3 Study the effect of compressional force on tablets	Transferring

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M.Pharm (Pharmaceutics) (Sem-II)		
On successful completion of the course, the students will be able to		
MPH 201T MOLECULAR	T-1 To Understand The various approaches for development of novel drug delivery Systems.	Understanding
PHARMACEUTICS (NANO TECHNOLOGY & TARGETED DDS) (NTDS)	T-2 The criteria for selection of drugs and polymers for the development of NTDS	Understanding
	T-3 The formulation and evaluation of novel drug deliverysystems	Relating/Judging
MPH 202T ADVANCED BIOPHARMACEUTI CS & PHARMACOKINETICS	T-1 To Understand The basic concepts in biopharmaceutics and pharmacokinetics	Understanding
	T-2 The use raw data and derive the pharmacokinetic models andparameters the best describe the process of drug absorption, distribution, metabolism and elimination.	Transferring
	T-3 The critical evaluation of biopharmaceutic studies involvingdrug product equivalency.	Judging
	T-4 The design and evaluation of dosage regimens of the drugsusing pharmacokinetic and biopharmaceutic parameters	Understanding
	T-5 The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic	Transferring
MPH 203T COMPUTER AIDEDDRUG DEVELOPMENT	T-1 To Understand History of Computers in Pharmaceutical Research and Development	Understanding
	T-2 Computational Modeling of Drug Disposition	Understanding
	T-3 Computers in Preclinical Development	Understanding
	T-4 Optimization Techniques in Pharmaceutical Formulation	Understanding
	T-5 Computers in Market Analysis	Understanding
	T-6 Computers in Clinical Development	Understanding

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	T-7 Artificial Intelligence (AI) and Robotics	Remembering/ Understanding
	T-8 Computational fluid dynamics(CFD)	Understanding
MPH 204T COSMETICS AND COSMECEUTICALS	T-1 To Understand Key ingredients used in cosmetics and cosmeceuticals	Understanding
	T-2 Key building blocks for various formulations	Understanding
	T-3 Current technologies in the market	Understanding
	T-4 Various key ingredients and basic science to developcosmetics and Cosmeceuticals	Transferring
	T-5 Scientific knowledge to develop cosmetics and cosmeceuticals with desired Safety, stability, and efficacy	Transferring
MPH 205P PHARMACEUTICS PRACTICALS – II	P-1 Understand Bioavailability studies and Pharmacokinetic andIVIVC data analysis	Understanding
	P-2 To study Computer Simulations and Computational Modeling and its use in Pharmacokinetics and Pharmacodynamics	Understanding
	P-3 To study formulation and evaluation of various novel dosage forms	Understanding/ Transferring
	P-4 To study to develop Clinical Data Collection manual	Transferring

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Vision:

Reaching towards preeminence in education by providing quality teaching and learning aspects with effective application of advance technologies to device an integrated framework that contains all the aspects of pharmaceutical education and research to develop an ideal pharmacist to serve humanity better than the best.

Mission:

- To impart high degree of excellence in pharmacy education to cater the evolving need of the students, industries and the society at large.
- To create and evaluate innovative pharmacy practice to support pharmaceutical research to optimized quality of medication, cost effectively and healthcare.
- To stimulate an exceptional community of students, faculty and staff.
- To attain personal and professional growth and success.

Mission of College

- To discover novelty in pharmaceutical sciences by improving high impact research, providing excellent research training in core areas of Institute.
- To disseminate transformative pharmacy practices.
- To promote diversity of thoughts and continuous learning.
- To provide society with pharmacist who are leaders in the profession.
- To provide students with an optimal learning environment.

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Programme Educational Objectives (PEO's)

- To discover novelty in pharmaceutical sciences by improving high impact research.
- To disseminate transformative pharmacy practices.
- To promote diversity of thoughts and continuous learning.
- To provide society with pharmacist who are leaders in the profession.
- To provide students with an optimal learning environment.

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Program Outcomes

PO-1	Pharmacy Knowledge	Graduates will assimilate knowledge sciences, pharmaceutical science and social, and administrative pharmacy manufacturing practices. or administrative pharmaceutical and manufacturing practice
PO-2	Planning ability	Graduates will use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions as well as Develop and implement plans and organize work to meet deadlines.
PO-3	Problem analysis	Graduates will identify, formulate, research literature and analyses complex pharmaceutical problems reaching substantiated conclusions using basic principles of sciences and pharmaceutical sciences and also develop ability to solving problem and making decisions during daily practice.
PO-4	Modem Tool Usage	Graduate will learn to create, select, and apply appropriate techniques, resources. and modern Pharmaceutical engineering tools including prediction and modelling to complex pharmacy activities with all understanding of the limitations
PO-5	Leadership skill	Graduate will be able to function effectively as an individual and as a member of team or leader in diverse teams and in multidisciplinary activities & Undertake participating roles as responsible residents or leadership roles when suitable to smooth progress in health and well-being.
PO-6	Professional Identify	The graduates will be focused on developing their carrier, as well as they can do and acquire authentic learning experience through practice exposure and interaction with pharmacist role model and they understand, analyse and communicate the value of their professional roles in society.
PO-7	Communicat ion	Graduate will learn to Communicate effectively on complex pharmacy activities with the respective pharmaceutical field design documentation, make effective presentations, and give and receive clear instructions.
PO-8	Social Activities	Graduated will be prepared to deal with patients behaviour, and psychology, thus for this they will be socially active, participates in social activity, motivates and make effective relation with public domain
PO-9	Lifelong Learning	Graduate will recognize need for and have the preparation and ability to engage in independent and lifelong learning in wider context of growing research and technological change.
PO-10	Pharmaceuti cal Ethics	Graduates will learn ethical principles that commits to professional ethics, responsibilities, and norms of the pharmacy practice.
PO-11	The Pharmacist and society	Apply reasoning informed try the contextual knowledge to assess societal, health, safety, and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

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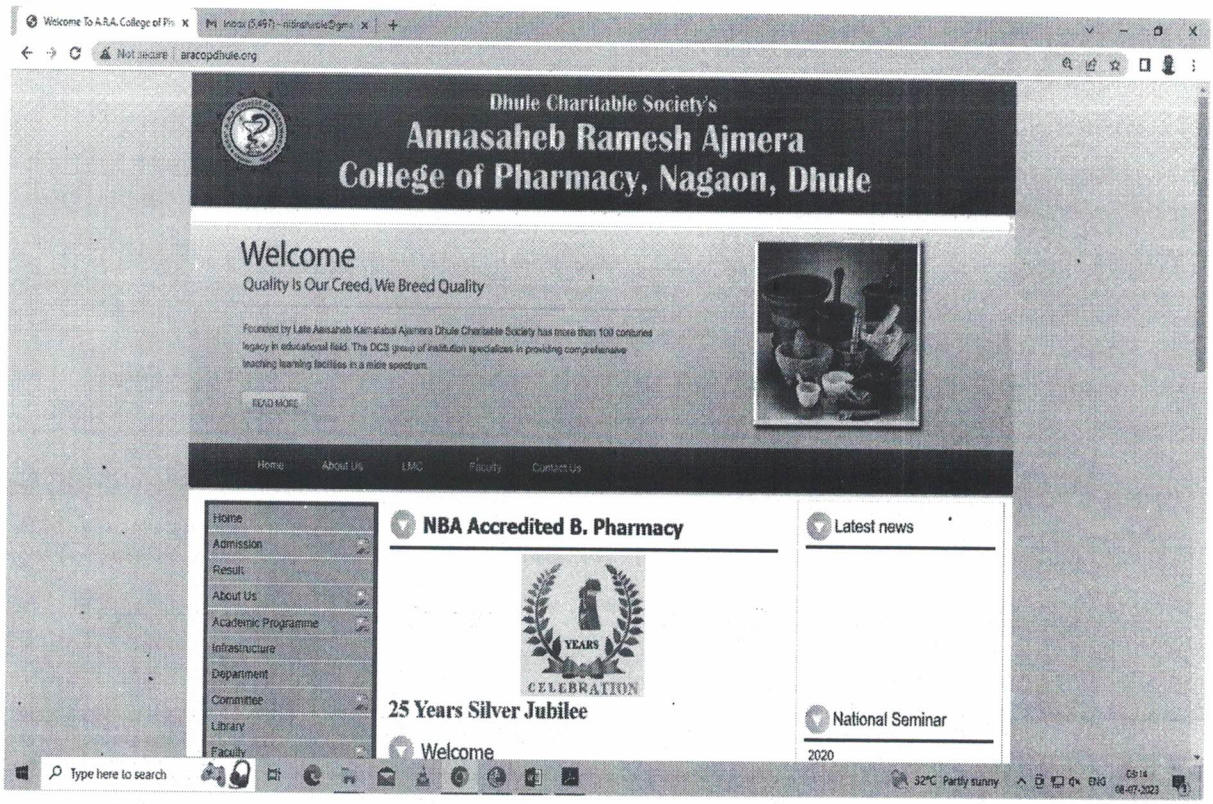
Communication of POs/COs



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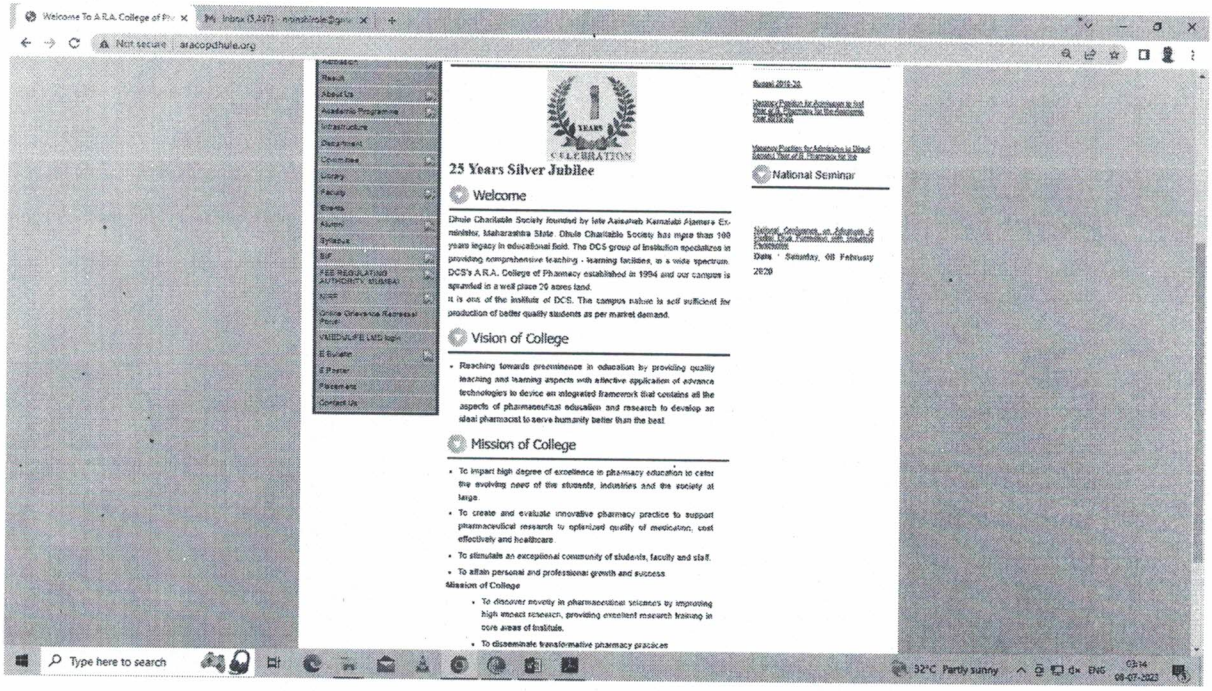

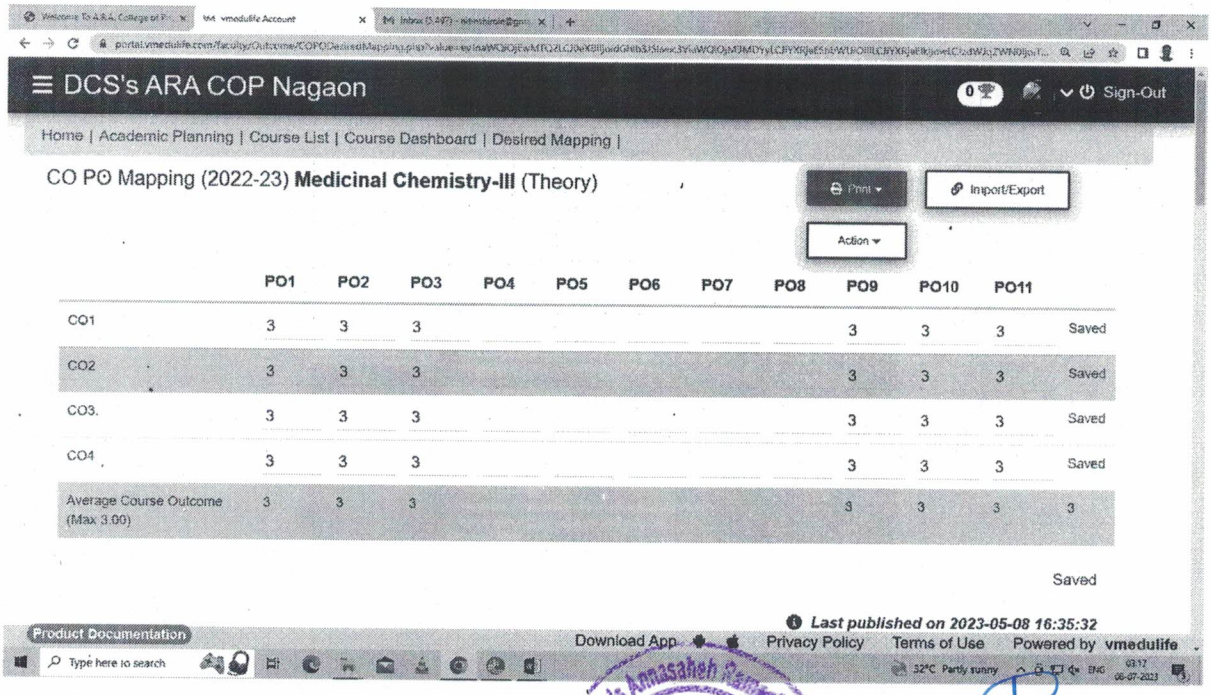

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	
CO1	3	3	3						3	3	3	Saved
CO2	3	3	3						3	3	3	Saved
CO3.	3	3	3						3	3	3	Saved
CO4	3	3	3						3	3	3	Saved
Average Course Outcome (Max 3.00)	3	3	3						3	3	3	3

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