

Shellino Education Society's

## ARUNAMAI COLLEGE OF PHARMACY

● Gat No 285, Vidgaon Road, Mamurabad, Jalgaon, (MS) 425002

Approved by PCI, New Delhi & Affiliated to KBC North Maharashtra University, Jalgaon

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**Nanasaheb R. G. Patil**  
(President)

**Dr. T. A. Deshmukh**  
(Principal)

**2.6.1 The collage sets course outcomes (generic and programme-specific) and degree attributes in accordance with regulatory body and university provisions; which is communicated to students and teachers through websites and other documents:**

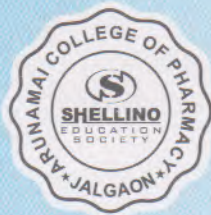
As per the University Curriculum designed for B. Pharmacy, Course Outcomes are given for each subject. The course outcomes for each subject are around 3 - 5 for each subject. There are separate syllabus results for theory and practical subjects. Program Outcomes based on course outcome are prescribed for B.Pharmacy. Before starting each subject in the syllabus, the teacher discusses the syllabus outcomes of that subject with the students. They are informed about it in advance and what are the consequences. In addition, through WhatsApp groups, students are informed which subject teachers will be allotted to teach in the coming weeks and what their objectives will be. Also, regular mock exams are also arranged to evaluate the subject result. These are displayed in the college building and on the collage website for the knowledge of teachers and students. Further, teachers are also creating correlations between course outcomes and program outcomes in their academic diaries to improve student skills.

### Course Outcome B. Pharmacy (PCI) Syllabus:

Course code /Course title	CO	Statements
First year B. Pharmacy (Semester-I)  BP101T. Human Anatomy & Physiology-I (Theory)	CO1:	Understand the various parts of human body, Structural and functions of cell and classification of tissue and types of tissue.
	CO2:	Describe the structure and function of skin & Deferent salient features and functions of Joints and also structural and function of bones.
	CO3:	Explain the body fluids & composition and function of blood; as well as Lymphatic organ and functions of lymphatic system.
	CO4:	Gain the knowledge about Structure and functions of sympathetic and parasympathetic nervous system and Structure and functions of Sensory organ and there disorder.



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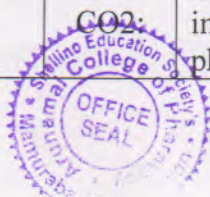
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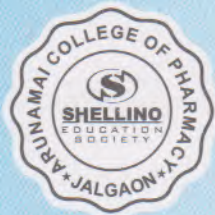
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(President)

**Dr. T. A. Deshmukh**  
(Principal)

	CO5:	Understands the anatomy of heart ; Structure and function of <b>Cardiovascular system</b>
BP102T. Pharmaceutical Analysis-I	CO1	Explain the Different techniques of analysis; expressing Concentration; 1 <sup>0</sup> & 2 <sup>0</sup> standards. Preparation & standardization of various molar & normal solutions & Explain the source, types, methods of minimizing errors.
	CO2:	Understands theories of <b>acid base titration</b> , neutralization curves; Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl
	CO3:	Explain the different method like Mohr's, Volhard's Modified Volhard's, Fajans method. Principle and steps involved in gravimetric analysis.
	CO4:	Explain the concept of Oxidation and reduction, Types of redox titrations their Principles and applications.
	CO5:	Learn the Electrochemical methods of analysis like conductometry, potentiometer, polarography and understand their application.
BP103T. Pharmaceutics-I	CO1:	Knowledge of pharmacopoeias also study the dosage forms; Parts of prescription; dose calculations based on age, body weight and body surface area..
	CO2:	Study the Pharmaceutical calculations; Study the definition classification, official preparations of powders & liquid dosage forms.
	CO3:	Understand definition, advantages and disadvantages classification and preparation of monophasic and biphasic dosage forms.
	CO4:	Types and preparation evaluation suppositories. Identify the physical & chemical incompatibilities.
	CO5:	Composition of ointments, pastes, creams and gels. Evaluation of semi solid dosages forms.
BP104T. Pharmaceutical Inorganic Chemistry	CO1:	Explain the Sources and types of impurities & method of preparation inorganic drugs and pharmaceuticals.
	CO2:	Explain the different buffers, their preparation and use in pharmaceutical systems; Functions of major physiological ions,



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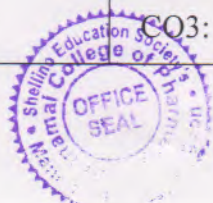
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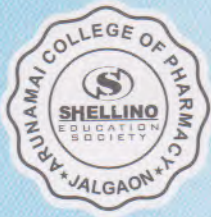
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(Principal)

	CO3:	Explain the medicinal important of pharmaceutical inorganic compound.
BP105T. Communication Skills	CO1:	Understand the behavioural needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
	CO2:	Basic listening skills, writing skills to communicate effectively and manage team as team player.
	CO3:	Effectively develop presentation skill with confidence to crack interviews.
	CO4:	Communication skills in group discussion; effectively stand in group/ businesswise.
BP106T.RBT Remedial biology	CO1:	The student must able to Know the cell biology and classification
	CO2:	Learn and comprehend various tissue organ system in plant and animal
	CO3:	Understands and explain anatomy and physiology of animal and plant
BP106T.RMT Remedial Mathematics	CO1:	The student must able to Study the theoretical concept of various topics and their application in pharmacy.
	CO2:	Solve the different types of pharmaceutical problems by applying theoretical concept.
	CO3:	Appreciate the important application of mathematics and statistics in pharmacy.
BP107P. Human Anatomy & Physiology-I (Theory)	CO1:	Explain the microscope parts apply this knowledge to study histology of different tissue.
	CO2:	Explain the component of skeletal system and identify and described parts in detail.
	CO3:	Methods use in diagnosis of disease using haematological test like bleeding time, clotting time, WBC, RBC, Blood group.
	CO4:	Describe the basic principle of cardiovascular system bright to aces heart rate, pulse rate and blood pressure.
BP108P. Pharmaceutical Analysis-I	CO1:	The student must able to Perform limit test of Chloride, Sulphate, Iron, and Arsenic.
	CO2:	Preparation and standardization of Sodium hydroxide Sulphuric acid, Sodium thiosulfate, Potassium permanganate, Ceric ammonium sulphate
	CO3:	Perform, Record and calculate Assay with Standardization of Titrant.



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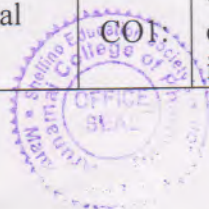
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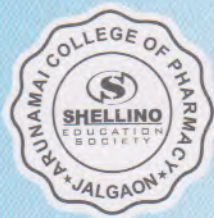
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	CO4:	To understand electro-analytical methods by determination of Normality
BP109P. Pharmaceutics-I	CO1:	Prepare monophasic, biphasic, powder and semisolid systems.
	CO2:	Perform experiment according to GLP & record in the journals.
BP110P. Pharmaceutical Inorganic Chemistry	CO1	Perform qualitative analysis of given inorganic compound.
	CO2:	Cary out qualitative test of given inorganic compound
	CO3:	Perform Limit test Chloride, sulphate Iron etc.
	CO4:	Preparation of inorganic pharmaceuticals
BP111P. Communication Skills	CO1:	Demonstrate and Apply basic communication & pronunciations skill and advanced learning skill.
	CO2:	Practice skill and presentation skill.
BP112RBP. Remedial biology	CO1:	Demonstrate microscope, section cutting technique its significance.
	CO2:	Perform blood group detection, Measurement of blood pressure, Tidal volume.
	CO3:	Identify microscopy of tissue pertinent steam, root, leaf, seed, fruit, and flower.

First year B. Pharmacy (Semester-II)	CO	Statement
BP201T. Human Anatomy & Physiology-II (Theory)	CO1:	Explain the anatomy and physiology of nervous system and structure and function of brain.
	CO2:	Describe anatomy and functions of stomach, formation and role of ATP.
	CO3:	Discuss the anatomy of lungs Volumes and capacities transport of respiratory gases tidal volume, artificial respiration and resuscitation methods as well as anatomy of respiratory system
	CO4:	Understands structure and function of pituitary gland, thyroid gland, Parathyroid gland and adrenal gland.
	CO5:	Described anatomy and function of male and female reproductive system and sex hormones.
BP202T. Pharmaceutical organic chemistry-I	CO1:	Classify & give IUPAC nomenclature of various organic compounds along with types of isomerisation.



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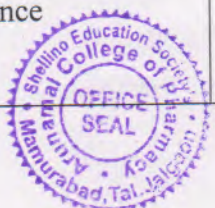
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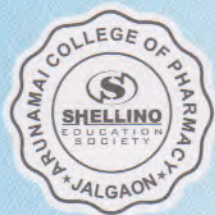
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	CO2:	Described and explain the hybridization and stability in alkanes, alkenes, and conjugated dienes.
	CO3:	Described and explain the different nucleophilic substitution and addition reaction in alkyl halides
	CO4:	Described and explain the method of preparation, reaction, chemical properties, uses, structure and their qualitative identification test for compounds of different functional group Alcohol, Carbonyl compounds (Aldehydes & ketones), <b>Carboxylic acids</b> , Aliphatic amines
BP203T. Biochemistry	CO1:	Understand classification, structure, function, digestion and metabolism of bio molecules.
	CO2:	Study thermodynamic and bio energetic aspect of biochemical reaction
	CO3:	Reproduce name structure, product and enzymes are involved in all metabolic process.
	CO4:	Understand the catalytic role of enzyme, importance of enzyme inhibitor in digestion of new molecule.
	CO5:	Explain three corner central paradigm of biochemistry i.e. replication, transcription, translation.
BP204T. Pathphysiology	CO1:	Explain the principle related to cell injury, adaption, repair, growth, inflammation.
	CO2:	Describe the etiology and Pathphysiology of disease related to CVS & Skeletal, joints.
	CO3:	Describe the etiology and Pathphysiology of disease related to Infectious disease.
	CO4:	Apply the knowledge of related to diseases and symptoms to identify the disease.
BP205T. Computer application in pharmacy	CO1:	Understand the basics of computers.
	CO2:	Differentiate among different web technologies and database.
	CO3:	Delate various application of computers in pharmacy.
BP206T. Environmental Science	CO1:	Describe the basics of environmental sciences like need and purpose of study the subject.
	CO2:	Classify and compare different sources of energies.
	CO3:	Describe the Structure and function of an ecosystem.



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BP207P. Human Anatomy & Physiology-II (Practical)	CO1:	Identify and explain histology structure of various tissues and organs of differed systems of human body.
	CO2:	Plan, execute and conclude the experiment by different methodologies.
	CO3:	Explain construction and working of spirometer for the measurement of lung volume and capacities.
	CO4:	Explain the response of human body visual acuity, reflex activity, body temperature.
BP208P. Pharmaceutical organic chemistry-I	CO1:	Practice and follow safety rule and precautionary measure in laboratory.
	CO2:	Identify and systematic qualitative analysis of organic compounds
	CO3:	Preparation of suitable solid derivatives from organic compounds & Construction of molecular models.
BP209P. Biochemistry	CO1:	Able to perform qualitative and quantitative analysis of various samples of carbohydrates, protein.
	CO2:	Understand the clinical application of biochemical method thru experiment like blood Creatinine, blood sugar, serum total cholesterol & Salivary amylase activity.
BP210P. Computer application in pharmacy	CO1:	Use MS Word MS Access for designing questionnaire, form to record patient information, creating patient database, mailing labels, invoice able and generate reports.
	CO2:	Apply learning to the problem of pharmaceutical origin.

Second year B. Pharmacy (Semester-III)	CO	Statement
BP301T. Pharmaceutical organic chemistry-II	CO1:	Explain different reaction and aromatic character, resonance, orientation effect of substituent in benzene and its derivatives.
	CO2:	Explain and described the method of preparation reaction chemical properties and uses structure and qualitative identification test for phenols, aromatic amines, aromatic acids and hydrocarbon.



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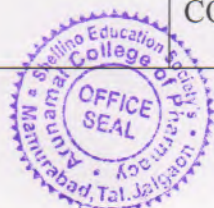
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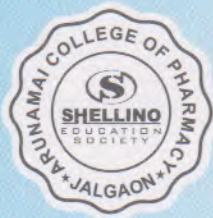
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	CO3:	Understand the chemistry of fats and oils along with determine their analytical constants like acid value, Saponification value, iodine value and RM value
	CO4:	Synthesis, reactions, Structure and medicinal uses <b>polynuclear hydrocarbons.</b>
	CO5:	Explain different conformational Stabilities & reactions of cyclopropane and cyclobutane
BP302T. Physical Pharmaceutics-I	CO1:	Understand the different physicochemical properties of drug molecule in the designing of the dosage form.
	CO2:	Know the principle of the chemical Kinetic & to use them for stability testing and determination of expiry date of formulation.
	CO3:	Demonstrate the use of physicochemical properties in the formulation development and evaluation of dosage forms.
BP303T. Pharmaceutical Microbiology	CO1:	Understand classification and method of identification isolation and cultivation and preservation of various classes of microorganisms.
	CO2:	Understand the uses of various microscopic technique staining technique and biochemical test for adaptation of microorganism
	CO3:	Describe various method for control microorganism their evolution and factor affecting their efficiency.
	CO4:	Describe various method used for sterilization of Pharmaceutical product and evaluation of efficiency of method of sterilization.
	CO5:	Outline cell culture technology and its applications in pharmaceutical industries.
BP304T. Pharmaceutical Engineering	CO1:	Explain the various unit operations used in Pharmaceutical industries.
	CO2:	Perform various processes involved in pharmaceutical manufacturing process.
	CO3:	Appreciate and comprehend significance of plant lay out design for optimum use of resources like Evaporation, Distillation, Filtration, Centrifugation, Size Separation.
	CO4:	Described various preventive methods used for corrosion control in Pharmaceutical industries



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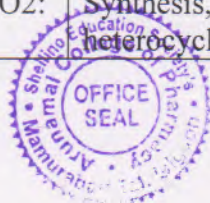
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BP305P. Pharmaceutical organic chemistry-II	CO1:	Perform experiment involving in laboratory techniques <b>recrystallization</b> & distillation.
	CO2:	Determine analytical constant like acid value, Saponification value ,iodine value of fats and oil
	CO3:	Explain the theoretical aspect of organic synthesis and perform various organic synthetic reactions.
	CO4:	Plan, execute and conclude the experiment using various methodologies.
BP306P. Physical Pharmaceutics-I	CO1:	Understand the principle & method for determination various physical parameter of formulation & drug.
	CO2:	Analyze HLB number of a surfactant by Saponification method.
	CO3:	Compare and contrast between different methods used in the determination of the same physicochemical parameters.
BP307P. Pharmaceutical Microbiology	CO1:	Select and utilize different equipment and processing in experimental microbiology.
	CO2:	Identify and isolate various microorganisms.
	CO3:	Perform sterility testing of pharmaceutical products.
	CO4:	Perform microbiological standardization of Pharmaceuticals.
BP308P. Pharmaceutical Engineering	CO1:	Impact knowledge of different unit operations process.
	CO2:	Perform numerical involved in calculating process related determinants.
	CO3:	Analyze and interpret the data generated from the experiments performed.

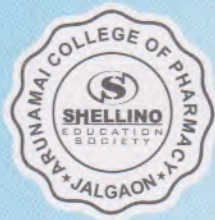
Second year B. Pharmacy (Semester-IV)	CO	Statement
BP401T. Pharmaceutical organic chemistry-III	CO1:	Basic knowledge and various terminologies involved in stereochemistry.
	CO2:	Understand nomenclature and classification Synthesis, reactions and medicinal uses heterocyclic compounds/derivatives



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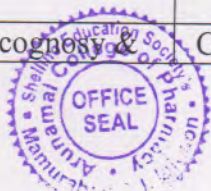
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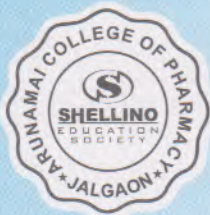
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	CO3:	Remembers the reaction Metal hydride, Clemmensen, Birch reduction, Wolff Kishner reduction. Oppenauer-oxidation & Dakin reaction. Beckmanns and Schmidt rearrangement. Claisen-Schmidt condensation
BP402T. Medicinal Chemistry-I	CO1:	Correlate the physico-chemical properties of drug with biological response and metabolism of drugs with biological activity
	CO2:	Explain the chemistry, metabolic pathways & SAR of drug acting on CNS like adrenergic, cholinergic drug.
	CO3:	Explain the chemistry & SAR of Benzodiazepines, Barbiturates & Phenothiazines
	CO4:	Explain the chemistry, metabolic pathways & SAR of narcotic & non-narcotic drugs.
BP403T. Physical Pharmaceutics-II	CO1:	Understand the concept of coarse & colloidal dispersion, rheology and powder technology and drug stability.
	CO2:	Identify the different type of dispersion, rheological properties of the different dosage forms.
	CO3:	Understand different type of orders of reaction and ways of drug degradation.
	CO4:	Explain methods for determine particle size by different methods
	CO5:	Explain with illustration the principles of chemical kinetics & to use for stability testing and determination expiry date of formulations.
BP404T. Pharmacology-I	CO1:	Explain terminologies used in pharmacology like synergism agonist, antagonist.
	CO2:	Explain the pharmacodynamic & there principles and mechanisms drug action, receptor theories and classification of receptors.
	CO3:	Explain the mechanism of drug acting on peripheral nervous system
	CO4:	Explain the pharmacology drug use in central nervous system.
	CO5:	Apply the knowledge of basic principle of pharmacology in predicting adverse drug reaction, drug interaction and drug development process.
BP405T. Pharmacognosy &	CO1:	Outline the alternative system medicine, Classify



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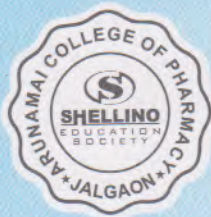
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Phyto chemistry-I		the drug according to origin, quality & quantitative control parameter of drug.
	CO2:	Describe the primary and secondary plant metabolite their biosynthesis and evaluation and therapeutics application.
	CO3:	Describe the application of plant tissue culture technique to with value to production secondary metabolite
	CO4:	<b>Cultivation, Collection, Processing and storage of drugs,</b> Factors influencing cultivation of medicinal plants. Plant hormones and their applications.
	CO5:	Detailed study with respect to chemistry, sources, preparation, evaluation, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and Medicines.
BP406P. . Medicinal Chemistry-I	CO1:	Demonstrate skills of handling synthetic procedure and quantitative evaluation technique.
	CO2:	Synthesize and explain reaction mechanism of medicinally important compounds by using conventional methods.
	CO3:	Perform quantitative analysis of drug such as Chlorpromazine, Phenobarbitone, Atropine Ibuprofen, Aspirin and furosemide.
	CO4:	Design the experimental requirement of Determination of Partition coefficient of organic molecule and evaluation.
BP407P. Physical Pharmaceutics-II	CO1:	Determine physico chemical properties in the formulation development and, evaluation of dosage form.
	CO2:	Determine reaction rate constant, order of different reaction.
	CO3:	Carrying out Accelerated stability studies.
	CO4:	Find out properties of powder & liquid dosage forms And observe on quality.
BP408P. Pharmacology-I	CO1:	Explain, Understand, evaluate and apply basic technique related instrument and animal handling for experiment purpose. Route of administration.
	CO2:	Understand the CPCSEA guideline for ethical



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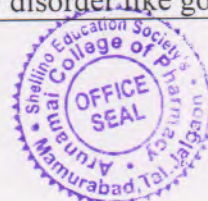
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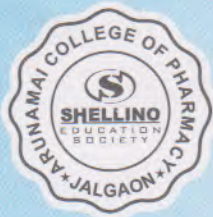
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		animal handling & Care of laboratory animal.
	CO3:	Explain common laboratory techniques, like blood withdrawal, serum plasma separation, anaesthetics and euthanasia used for animal studies.
	CO4:	Demonstrate the effect of drugs on animals by simulated experiments.
BP409P. Pharmacognosy & Phyto chemistry-I	CO1:	Determination the quantitative microscopy for leaf constant.
	CO2:	Determine different extractive, ash value, moisture content, swelling index and foaming index by official books.
	CO3:	Determination of histological feature of plant of diagnostic significance like size of starch grains, calcium oxalate crystals.
	CO4:	Analysis of crude drugs by chemical tests.

Third year B. Pharmacy (Semester-V)	CO	Statement
BP501T. Medicinal Chemistry-II	CO1:	Understand the chemistry of drugs with respect to their pharmacological activity.
	CO2:	Be aware of the drug metabolic pathways, adverse effect and therapeutic value of drugs.
	CO3:	Know the Structural Activity Relationship of different class of drugs.
	CO4:	Study the chemical synthesis of selected drugs.
BP502T. Industrial Pharmacy-I	CO1:	Understand the various dosage form and their manufacturing technique.
	CO2:	All the related and practical aspect of solid, liquid and semisolid dosage form and their development & evaluation.
	CO3:	Correlate the theoretical knowledge with professional and practical need of pharmaceutical industry.
BP503T. Pharmacology-II	CO1:	Classify the drug use for cardiovascular, urinary and endocrine system and explain their pharmacology.
	CO2:	Explain autacoids and their drug and role in inflammatory disorder like gout & rheumatoid.



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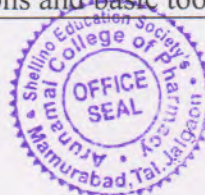
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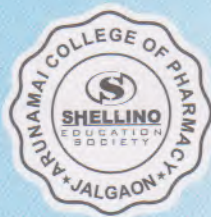
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	CO3:	Explain & understand the concept of bioassay, Types of bioassay, method and applications of with different example of drug.
BP504T. Pharmacognosy & Phyto chemistry-II	CO1:	Explain the modern process of extraction by using different method principles, isolation, purification, identification and analysis of diverse phytoconstituents.
	CO2:	To develop the skill of general method of extraction, evaluation and chemical test of crude drug containing secondary metabolite.
	CO3:	Establish the characterization & identification of the herbal drugs like Forskolin, Sennoside, Artemisinin, Diosgenine Digoxin.
	CO4:	Study of utilization of radioactive isotopes in the investigation of Biogenetic studies.
BP505T. Pharmaceutical Jurisprudence	CO1:	The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
	CO2:	Various Indian pharmaceutical Acts and Laws
	CO3:	The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
	CO4:	The code of ethics during the pharmaceutical practice.
BP506P. Industrial Pharmacy-I	CO1:	Proper use of various equipments in pharmaceutical laboratory related to tablets, capsules and tablet coating.
	CO2:	Include knowledge of formulation evaluation and labeling of Tablets and capsules
	CO3:	Use necessary tools and equipment for preparation as per SOP
	CO4:	Describe the evaluation criteria for glass containers
	CO5:	as per I.P.
BP507P. Pharmacology-II	CO1:	Understand methods of blood collection from experimental animals and various routes of drug administration and experimental principles for experiments.
	CO2:	Describe the composition of physiological salt solutions and basic tools used in pharmacology



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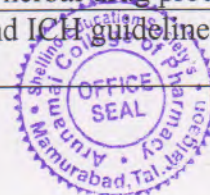
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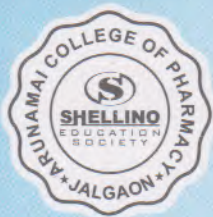
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	CO3:	Perform experiments using different isolated preparations and describe the effect of different drugs on the concentration response curve, interpret the action of different drugs using simulation software.
BP508P. Pharmacognosy & Phyto chemistry-II	CO1:	Identify crude drugs based on morphological and microscopic characters and assign biological source chemical constituents and therapeutic uses.
	CO2:	Apply the knowledge of microscopic characters for powder drug formulation.
	CO3:	Understanding the processes behind the extraction and isolation of alkaloids.
	CO4:	Perform TLC on herbal extract.
	CO5:	Analysis of crude drugs by chemical tests.

Third year B. Pharmacy (Semester-VI)	CO	Statement
BP601T. Medicinal Chemistry-III	CO1:	Understand the chemistry of drugs such as B-lactam antibiotics in relation to their pharmacological activity.
	CO2:	Learn the metabolism, adverse effects and therapeutic value of drugs such as antibiotics and antimalarial.
	CO3:	Know the Structural Activity Relationship of different class of drugs like anti-tubercular agents, Quinolones & antiviral agents.
	CO4:	Understand the importance of metabolism, SA& IUPAC of sulphonamides and sulfones.
	CO5:	Understand the importance of drug design and different techniques of drug design.
BP602T. Pharmacology-III	CO1:	Understand the mechanism of action of drugs and its relevance in the treatment of various infectious diseases.
	CO2:	Comprehend the principles of toxicology and treatment of various poisoning.
	CO3:	Appreciate correlation of pharmacology with related medical sciences.
BP603T. Herbal Drug Technology	CO1:	Understand raw material as source of herbal drugs from cultivation to herbal drug product.
	CO2:	Know the WHO and ICH guidelines for evaluation of herbal drugs.



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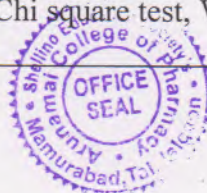
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	CO3:	Know the herbal cosmetics, natural sweeteners, nutraceuticals
	CO4:	Appreciate patenting of herbal drugs, GMP.
BP604T. Biopharmaceutics & Pharmacokinetics	CO1:	Understand the basic concepts and their importance in biopharmaceutics and pharmacokinetics.
	CO2:	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
	CO3:	To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
	CO4:	Understand various pharmacokinetic parameters, their significance & applications
BP605T. Pharmaceutical Biotechnology	CO1:	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries.
	CO2:	Genetic engineering applications in relation to production of pharmaceuticals.
	CO3:	Importance of Monoclonal antibodies in Industries
	CO4:	Appreciate the use of microorganisms in fermentation technology
BP606T. Quality Assurance	CO1:	Understand the cGMP aspects in a pharmaceutical industry
	CO2:	To appreciate the importance of documentation
	CO3:	Understand the scope of quality certifications applicable to pharmaceutical industries
	CO4:	Be aware of the responsibilities of QA & QC departments
BP607P. Medicinal Chemistry-III	CO1:	Preparation of medicinally important compounds or intermediates by Microwave irradiation technique.
	CO2:	Perform assay on drug.
	CO3:	Apply the principle of green chemistry.
	CO4:	Determination of physicochemical properties using drug design software.
BP608P. Pharmacology-III	CO1:	Problem based on dose calculation in pharmacological experiment and calculation of pharmacokinetic parameter like Student's t test, ANOVA, Chi square test, Wilcoxon Signed Rank test.



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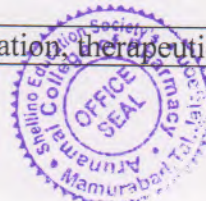
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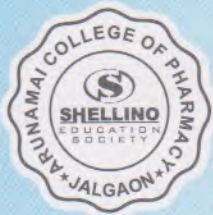
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	CO2:	The effect of drugs on animals by simulated software's.
	CO3:	Determination of different toxicity study.
	CO4:	Different biostatistics methods in experimental pharmacology.
	CO1:	Perform preliminary photochemical screening of crude drugs.
BP609P. Herbal Drug Technology	CO2:	Understanding the process behind extraction and isolation of alkaloids.
	CO3:	Analysis of herbal drugs from recent pharmacopoeias
	CO4:	Determine Phenol content, Aldehydes content etc.

Final year B. Pharmacy (Semester-VII)	CO	Statement
BP701T. Instrumental Method Analysis	CO1:	Explain and illustrate the theory and application of <b>UV Visible spectroscopy</b> , Fluorimetry, <b>IR spectroscopy</b> , Flame Photometry, Atomic absorption spectroscopy, HPLC, GC, TLC, Paper chromatography, Ion exchange, Affinity chromatography, Gel chromatography.
	CO2:	Perform mathematical calculation to obtain quantitative result from <b>UV &amp; chromatography</b> parameter.
	CO3:	Understand the chromatographic separation and analysis of drugs.
	CO4:	Recall the terminologist associated with <b>spectroscopy &amp; chromatography</b> .
BP702T. Industrial Pharmacy-II	CO1:	Know the process of pilot plant and scale up of pharmaceutical dosage forms.
	CO2:	Understand the process of technology transfer from lab scale to commercial batch.
	CO3:	Know different Laws and Acts that regulate pharmaceutical industry.
	CO4:	Understand the approval process and regulatory requirements for drug products.
	CO5:	
BP703T. Pharmacy Practice	CO1:	Understand the management of hospital, community, clinical pharmacy and therapeutic committee.
	CO2:	ADR classification, therapeutic drug monitoring.



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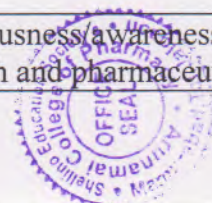
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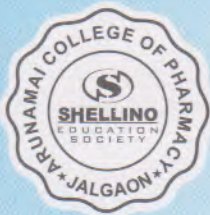
		drug store management and inventory control.
	CO3:	Précis the OTC medication, investigational use of drug and interpretation of clinical lab tests.
	CO4:	Understanding of drug delivery systems, prescribed drug orders and communication skills in practical situations.
	CO5:	Evaluation of patient counselling and Rational drug therapy
BP704T. Novel Drug Delivery System	CO1:	To understand various approaches for the development of new drug delivery systems.
	CO2:	To understand the criteria for selecting drugs and polymers for the development
	CO3:	New drug delivery systems, their design and evaluation.
BP705P. Instrumental Method Analysis	CO1:	Perform analyze and determine and report the content of drug by using <b>UV Visible spectroscopy</b> , Fluorimetry, <b>IR spectroscopy</b> , Flame Photometry, Atomic absorption spectroscopy, colourometry and turbidometry.
	CO2:	The separation of mixture component by applying separation principle on chromatographic technique.
	CO3:	Elaborate the Demonstration experiment on HPLC' Gas Chromatography.
Practice school	CO1:	Development of skill in the modern tools.
	CO2:	Acquire skill of documentation and record keeping.
	CO3:	Plan academic carrier, and personal interests via research experiences.

Final year B. Pharmacy (Semester-VIII)	CO	Statement
BP801T. Biostatistics And Research Methodology	CO1:	Understand various approaches in Biostatistics & Mean, Median, Mode used in pharmaceutical field
	CO2:	Know the operation of M.S. Excel, SPSS, R and MINITAB, DoE (Design of Experiment)
	CO3:	Know the various statistical techniques to solve statistical problems.
	CO4:	Appreciate statistical techniques in solving the problems
BP802T. Social And Preventive Pharmacy	CO1:	Gain a higher consciousness/awareness of current issues related to health and pharmaceutical issues



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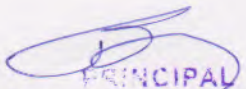
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		in the country and around the world.
	CO2:	A critical way of thinking is based on current healthcare developments.
	CO3:	Evaluate alternative ways of solving health related problems and Pharmaceutical problems.
BP804ET. Pharmaceutical Regulatory Science	CO1:	Learn about the drug discovery and development process
	CO2:	Know the regulatory authorities and agencies that regulate production and sales of pharmaceuticals.
	CO3:	Know the regulatory approval process and their Indian and registration International markets.
BP806ET. Quality Control and Standardization of Herbals	CO1:	Know the WHO guidelines for quality control of herbal medicines.
	CO2:	Learn about quality assurance in the herbal medicine industry.
	CO3:	Regulatory approval process and their registration in India and International markets.
	CO4:	Appreciate EU and ICH guidelines for quality control of herbal medicines.



  
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### Programme Outcomes

**1. Pharmacy Knowledge:** Possess basic and fundamental knowledge and intellectual ability related to the profession of pharmacy including biomedical science; Pharmaceutical Sciences; Behavioural, social and organizational pharmacy science and manufacturing practices.

**2. Planning Abilities:** Graduates demonstrate effective planning abilities along with time management, Resource management, Delegation skills and Organizational skills.

**3. Problem analysis:** Use the principles of scientific inquiry, think analytically, clearly and critically, when solving problems and making decisions in everyday practice. Systematically seek, analyze, evaluate and apply information and make valid decisions.

**4. Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools while understanding limitations.

**5. Leadership skills:** Understand and consider human reactions to change, motivation issues, leadership and team building when planning the changes necessary to meet practice, professional and social responsibilities. Believe in participatory roles such as responsible society or leadership roles when appropriate to improve health and well-being.

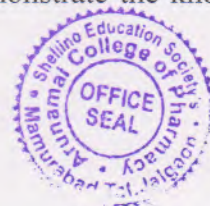
**6. Professional Identity:** Understand, analyze and communicate the value of their professional roles in society as health care professionals, health promoters, teachers, managers, employers, employees.

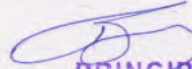
**7. Pharmaceutical Ethics:** Apply noble personal values and ethical principles in professional and social contexts. Express behavior that recognizes cultural and individual variability in values, communication, and lifestyle. Use an ethical framework; Apply ethical principles when making decisions and take responsibility for the consequences associated with decisions.

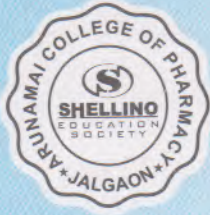
**8. Communication:** Correspond effectively with the pharmacy community and society at large, such as knowing and writing effective information, presenting and documenting effectively, and giving and collecting clear instructions.

**9. The Pharmacist and society:** Apply reasoning informed by sound knowledge to assess social, health, safety and officially sanctioned issues and ensuing responsibilities related to professional pharmacy practice.

**10. Environment and sustainability:** Understand the impact of commercial pharmacy solutions in social and environmental contexts and demonstrate the knowledge and skills required for sustainable development.



  
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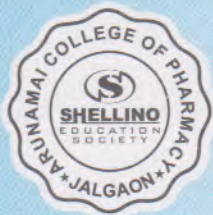
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**11. Life-long learning:** Recognize the need for independent and lifelong learning in the broader context of technological change, and maintain readiness and competence. Assess yourself and use feedback effectively from others to identify learning needs and address ongoing core needs.



  
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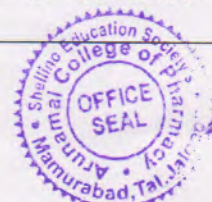
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### Programme Education Objective

PEO No.	PEO Nomenclature	Description
PEO1	Knowledge	Graduates of the program will acquire theoretical knowledge along with essential practical skill sets of pharmaceutical sciences and will be able to use these tools in the pharmaceutical industry, hospitals and institutions or any business sector required for success.
PEO2	Core competence	To complete a perfect blend of fundamentals in pharmaceutical, pharmaceutical chemistry, pharmacology, pharmaceutical and pharmaceutical industries, pharmaceutical analysis as per the needs of community and hospital pharmacy. The objective of the program is to develop students competently for the future
PEO3	Extensiveness	To train students with good knowledge in compounding, dispersing, drug properties, synthesis, formulation and development, analytical aspects, medicinal plants and herbal formulations, pharmacodynamic, pharmacokinetics and molecular modeling with practical performance. Also applying all this in research and development to create new herbal and synthetic pharmaceutical products for the benefit of society.
PEO4	Training	The ideology of the institute is to train graduates to excel in higher education in India and abroad and to succeed in the pharmaceutical professional field. A profession in which the student chooses innovative teaching methods that engage the student in self-learning.
PEO5	professionalism	To inculcate character, self-confidence, self-discipline in the student and make them proficient in their professional and ethical attitude, effective communication skills-teamwork skills. Multidisciplinary approach and ability to relate problems of pharmaceutical sciences to the wider social context.
PEO6	Assessment	Graduates of the program will be able to evaluate the advantages and disadvantages, advantages and disadvantages, the strengths and weaknesses of the subject studied in pharmaceutical technology that they need, and the ideology they see in the field of pharmaceutical science.



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