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EDUCATION EMPOWERS

Babu Vijendra Marg, Adarsh Institutional
Area Gangoh, Distt. Saharanpur (U.P.)
247341, India
Tel: +91 7830810052
E-mail: registrargangoh@shobhituniversity.ac.in
U.: www.sug.ac.in

School of Pharmacy (AVIPS)

Bachelor of Pharmacy (B. Pharm.)

Program Outcomes, Program Specific Outcomes & Course Outcomes (POs, PSOs& COs)

Program Outcomes

Program Outcome		Statement
PO 1	Clinical Competence	Graduates will be able to conduct comprehensive medication reviews, assess patient health needs, and design effective therapeutic regimens.
PO 2	Pharmaceutical Knowledge	Graduates will possess a thorough understanding of pharmacology, pharmacotherapy, drug interactions, and the mechanisms of drug action.
PO 3	Ethical Practice	Graduates will demonstrate professionalism and ethical behavior in all aspects of pharmacy practice, including patient interactions and professional relationships.
PO 4	Communication Skills	Graduates will effectively communicate with patients, caregivers, and healthcare team members, ensuring clarity and understanding of medication information.
PO 5	Critical Thinking and Problem Solving	Graduates will apply critical thinking skills to analyze patient data, identify medication-related problems, and develop appropriate solutions.
PO 6	Research and Evidence-Based Practice	Graduates will be able to conduct research, critically evaluate scientific literature, and apply evidence-based guidelines in clinical practice.
PO 7	Inter-professional Collaboration	Graduates will work effectively within interdisciplinary teams to enhance patient care and contribute to overall healthcare delivery.
PO 8	Lifelong Learning	Graduates will demonstrate a commitment to continuous professional development and lifelong learning in the rapidly evolving field of pharmacy.
PO 9	Public Health Awareness	Graduates will engage in community health initiatives, promoting wellness and preventive care through education and outreach.
PO 10	Contribution to Drug Discovery and Development	Gain exposure to the process of drug discovery, formulation, and regulatory approval, contributing to advancements in pharmaceutical research and the development of new therapies.
PO 11	Legal Aspects of Pharmacy Practice	Understand the legal and regulatory frameworks governing pharmacy practice, including drug laws, licensing, and professional responsibilities in various healthcare settings.

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PO 12	Continuous Professional Development	Cultivate a habit of continuous learning through professional development, conferences, and reading, ensuring that pharmacy practice evolves in response to new knowledge and technologies.

Program Specific Outcomes (PSOs)

Program Specific Outcome	Statement
PSO 1	Students will demonstrate the ability to assess patient medication needs, develop individualized care plans, and implement appropriate therapeutic interventions.
PSO2	Students will gain knowledge in drug formulation, development processes, and the management of pharmaceutical products throughout their lifecycle.
PSO 3	Students will apply pharmacological principles and clinical knowledge to evaluate and optimize drug therapy in diverse patient populations.
PSO 4	Students will understand the regulatory frameworks governing pharmacy practice, including drug approval processes, safety, and quality assurance.

Course Outcomes (COs)
Semester I

Course: Human Anatomy and Physiology-I

Course Outcomes	Statement
CO 1	Explain the gross morphology, structure and functions of various organs of the humanbody.
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

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DIRECTOR
Gangoh-Saharanpur U.P.

Shobhit University
EDUCATION EMPOWERS
Babu Vijendra Marg, Adarsh Institutional
Area Gangoh, Distt. Saharanpur (U.P.)
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Course: Pharmaceutical Analysis

Course Outcomes	Statement
CO 1	Understand the principles of volumetric and electro chemical analysis
CO 2	Carryout various volumetric and electrochemical titrations
CO 3	Develop analytical skills

Course: Pharmaceutics- I

Course Outcomes	Statement
CO 1	Know the history of profession of pharmacy
CO 2	Understand the basics of different dosage forms, pharmaceutical incompatibilities andpharmaceutical calculations
CO 3	Understand the professional way of handling the prescription
CO 4	Preparation of various conventional dosage forms

Course: Pharmaceutical Inorganic Chemistry

Course Outcomes	Statement
CO 1	Know the sources of impurities and methods to determine the impurities in inorganicdrugs and pharmaceuticals
CO 2	Understand the medicinal and pharmaceutical importance of inorganic compounds

Course: Communication Skills

Course Outcomes	Statement
CO 1	Understand the behavioral needs for a Pharmacist to function effectively in theareas of pharmaceutical operation
CO 2	Communicate effectively (Verbal and Non Verbal)
CO 3	Effectively manage the team as a team player
CO 4	Develop interview skills

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CO 5	Develop Leadership qualities and essentials

Course: Remedial Biology

Course Outcomes	Statement
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 withspecial reference to human

Course: Remedial Mathematics

Course Outcomes	Statement
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

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Course Outcomes (COs)

2nd Semester

Course: Human Anatomy and Physiology-II

Course Outcomes	Statement
CO 1	Explain the gross morphology, structure and functions of various organs of thehuman 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
CO 6	Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

Course: Pharmaceutical Organic Chemistry –I

Course Outcomes	Statement
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

Course: Biochemistry

Course Outcomes	Statement
CO 1	Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
CO 2	Understand the metabolism of nutrient molecules in physiological and pathological conditions.

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CO 3	Understand the genetic organization of mammalian genome and functions ofDNA in the synthesis of RNAs and proteins.

Course: Pathophysiology

Course Outcomes	Statement
CO 1	Describe the etiology and pathogenesis of the selected disease states;
CO 2	Name the signs and symptoms of the diseases; and
CO 3	Mention the complications of the diseases.

Course: Computer Applications in Pharmacy

Course Outcomes	Statement
CO 1	Know the various types of application of computers in pharmacy
CO 2	Know the various types of databases
CO 3	Know the various applications of databases in pharmacy

Course: Environmental Sciences

Course Outcomes	Statement
CO 1	Create the awareness about environmental problems among learners.
CO 2	Impart basic knowledge about the environment and its allied problems.
CO 3	Develop an attitude of concern for the environment.
CO 4	Motivate learner to participate in environment protection and environmentimprovement.
CO 5	Acquire skills to help the concerned individuals in identifying and solvingenvironmental problems.
CO6	Strive to attain harmony with Nature.

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Course Outcomes (COs)

3rd Semester

Course: Pharmaceutical Organic Chemistry –II

Course Outcomes	Statement
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	Prepare organic compounds

Course: Physical Pharmaceutics-I

Course Outcomes	Statement
CO 1	Understand various physicochemical properties of drug molecules in thedesigning 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.

Course: Pharmaceutical Microbiology

Course Outcomes	Statement
CO 1	Understand methods of identification, cultivation and preservation of various microorganisms
CO 2	To 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 pharmaceuticalindustries.

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Course: Pharmaceutical Engineering

Course Outcomes	Statement
CO 1	To know various unit operations used in Pharmaceutical industries.
CO 2	To understand the material handling techniques.
CO 3	To perform various processes involved in pharmaceutical manufacturing process.
CO 4	To carry out various test to prevent environmental pollution.
CO 5	To appreciate and comprehend significance of plant lay out design for optimumuse of resources.
CO6	To appreciate the various preventive methods used for corrosion control inPharmaceutical industries.

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Course Outcomes (COs)

4th Semester

Course: Pharmaceutical Organic Chemistry –III

Course Outcomes	Statement
CO 1	Understand the methods of preparation and properties of organic compounds
CO 2	Explain the stereo chemical aspects of organic compounds and stereo chemicalreactions
CO 3	Know the medicinal uses and other applications of organic compounds

Course: Medicinal Chemistry – I

Course Outcomes	Statement
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 ofdrugs
CO 3	Know the Structural Activity Relationship (SAR) of different class of drugs
CO 4	Write the chemical synthesis of some drugs

Course: Physical Pharmaceutics-II

Course Outcomes	Statement
CO 1	Understand various physicochemical properties of drug molecules in thedesigning 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.

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Shobhit University
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Course: Pharmacology-I

Course Outcomes	Statement
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 ofvarious diseases.
CO 4	Observe the effect of drugs on animals by simulated experiments
CO 5	Appreciate correlation of pharmacology with other bio medical sciences

Course: Pharmacognosy and Phytochemistry-I

Course Outcomes	Statement
CO 1	To know the techniques in the cultivation and production of crude drugs
CO 2	To know the crude drugs, their uses and chemical nature
CO 3	Know the evaluation techniques for the herbal drugs
CO 4	To carry out the microscopic and morphological evaluation of crude drugs

Course Outcomes (COs)
5th Semester

Course: Medicinal Chemistry – II

Course Outcomes	Statement
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 ofdrugs
CO 3	Know the Structural Activity Relationship of different class of drugs
CO 4	Study the chemical synthesis of selected drugs

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Course: Industrial Pharmacy-I

Course Outcomes	Statement
CO 1	Know the various pharmaceutical dosage forms and their manufacturingtechniques.
CO 2	Know various considerations in development of pharmaceutical dosage forms
CO 3	Formulate solid, liquid and semisolid dosage forms and evaluate them for theirquality

Course: Pharmacology-II

Course Outcomes	Statement
CO 1	Understand the mechanism of drug action and its relevance in the treatment ofdifferent diseases
CO 2	Demonstrate isolation of different organs/tissues from the laboratory animals bysimulated experiments
CO 3	Demonstrate the various receptor actions using isolated tissue preparation
CO 4	Appreciate correlation of pharmacology with related medical sciences

Course: Pharmacognosy and Phytochemistry-II

Course Outcomes	Statement
CO 1	To know the modern extraction techniques, characterization and identification of theherbal 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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DIRECTOR
Gangoh-Saharanpur,UP

Shobhit University
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Course: Pharmaceutical Jurisprudence

Course Outcomes	Statement
CO 1	The Pharmaceutical legislations and their implications in the development andmarketing of pharmaceuticals.
CO 2	Various Indian pharmaceutical Acts and Laws
CO 3	The regulatory authorities and agencies governing the manufacture and sale ofpharmaceuticals
CO 4	The code of ethics during the pharmaceutical practice

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Shobhit University
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Course Outcomes (COs)
6th Semester

Course: Medicinal Chemistry – III

Course Outcomes	Statement
CO 1	Understand the importance of drug design and different techniques of drugdesign.
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.

Course: Pharmacology-III

Course Outcomes	Statement
CO 1	Understand the mechanism of drug action and its relevance in the treatment ofdifferent infectious diseases
CO 2	Comprehend the principles of toxicology and treatment of various poisonings and
CO 3	Appreciate correlation of pharmacology with related medical sciences.

Course: Herbal Drug Technology

Course Outcomes	Statement
CO 1	Understand raw material as source of herbal drugs from cultivation to herbal drugproduct
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.

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Shobhit University
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Course: Biopharmaceutics and Pharmacokinetics

Course Outcomes	Statement
CO 1	Understand the basic concepts in biopharmaceutics and pharmacokinetics andtheir 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 drugproducts and their significance.
CO 4	Understand various pharmacokinetic parameters, their significance & applications.

Course: Pharmaceutical Biotechnology

Course Outcomes	Statement
CO 1	Understanding the importance of Immobilized enzymes in PharmaceuticalIndustries
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

Course: Pharmaceutical Quality Assurance

Course Outcomes	Statement
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 pharmaceuticalindustries
CO 4	Understand the responsibilities of QA & QC departments

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Course Outcomes (COs)

7th Semester

Course: Instrumental Methods of Analysis

Course Outcomes	Statement
CO 1	Understand the interaction of matter with electromagnetic radiations and itsapplications in drug analysis
CO 2	Understand the chromatographic separation and analysis of drugs.
CO 3	Perform quantitative & qualitative analysis of drugs using various analyticalinstruments.

Course: Industrial Pharmacy-II

Course Outcomes	Statement
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

Course: Pharmacy Practice

Course Outcomes	Statement
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 clinicalreview
CO 4	Obtain medication history interview and counsel the patients
CO 5	Identify drug related problems
CO6	Detect and assess adverse drug reactions

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CO7	Interpret selected laboratory results (as monitoring parameters in therapeutics) ofspecific disease states
CO8	Know pharmaceutical care services
CO9	Do patient counseling in community pharmacy;
CO10	Appreciate the concept of Rational drug therapy.

Course: Novel Drug Delivery Systems

Course Outcomes	Statement
CO 1	To understand various approaches for development of novel drug delivery systems.
CO 2	To understand the criteria for selection of drugs and polymers for the development ofNovel drug delivery systems, their formulation and evaluation

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Course Outcomes (COs)

8th Semester

Course: Biostatisitcs and Research Methodology

Course Outcomes	Statement
CO 1	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design ofExperiment)
CO 2	Know the various statistical techniques to solve statistical problems
CO 3	Appreciate statistical techniques in solving the problems.

Course: Social and Preventive Pharmacy

Course Outcomes	Statement
CO 1	Acquire high consciousness/realization of current issues related 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 to health and pharmaceutical issues.

Course: Pharma Marketing Management

Course Outcomes	Statement
CO 1	The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.

Course: Pharmaceutical Regulatory Science

Course Outcomes	Statement
CO 1	Know about the process of drug discovery and development
CO 2	Know the regulatory authorities and agencies governing the manufacture and saleof pharmaceuticals
CO 3	Know the regulatory approval process and their registration in Indian

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DIRECTOR
Gangoh-Saharanpur U.P.

Shobhit University
EDUCATION EMPOWERS
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Course: Pharmacovigilance

Course Outcomes	Statement
CO 1	Why drug safety monitoring is important?
CO 2	History and development of pharmacovigilance
CO 3	National and international scenario of pharmacovigilance
CO4	Dictionaries, coding and terminologies used in pharmacovigilance
CO5	Detection of new adverse drug reactions and their assessment
CO6	International standards for classification of diseases and drugs
CO7	Adverse drug reaction reporting systems and communication in pharmacovigilance
CO8	Methods to generate safety data during pre-clinical, clinical and post approval phases ofdrugs' life cycle
CO9	Drug safety evaluation in pediatrics, geriatrics, pregnancy and lactation
CO10	Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India
CO11	ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning
CO12	CIOMS requirements for ADR reporting
CO13	Writing case narratives of adverse events and their quality.

Course: Quality Control and Standardization of Herbals

Course Outcomes	Statement
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 andinternational markets
CO4	Appreciate EU and ICH guidelines for quality control of herbal drugs

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Course: Computer Aided Drug Design

Course Outcomes	Statement
CO 1	Design and discovery of lead molecules
CO 2	The role of drug design in drug discovery process
CO 3	The concept of QSAR and docking
CO4	Various strategies to develop new drug like molecules.
CO5	The design of new drug molecules using molecular modeling software

Course: Cell and Molecular Biology

Course Outcomes	Statement
CO 1	Summarize cell and molecular biology history.
CO 2	Summarize cellular functioning and composition.
CO 3	Describe the chemical foundations of cell biology.
CO4	Summarize the DNA properties of cell biology.
CO5	Describe protein structure and function.
CO6	Describe cellular membrane structure and function.
CO7	Describe basic molecular genetic mechanisms.
CO8	Summarize the Cell Cycle

Course: Pharmacological Screening Methods

Course Outcomes	Statement
CO 1	Appreciate the applications of various commonly used laboratory animals.
CO 2	Appreciate and demonstrate the various screening methods used in preclinicalresearch

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CO 3	Appreciate and demonstrate the importance of biostatistics and research methodology
CO4	Design and execute a research hypothesis independently

Course: Advanced Instrumentation Techniques

Course Outcomes	Statement
CO 1	Understand the advanced instruments used and its applications in drug analysis
CO 2	Understand the chromatographic separation and analysis of drugs.
CO 3	Understand the calibration of various analytical instruments
CO4	Know analysis of drugs using various analytical instruments.

Course: Dietary Supplements and Nutraceuticals

Course Outcomes	Statement
CO 1	Understand the need of supplements by the different group of people to maintainhealthy life.
CO 2	Understand the outcome of deficiencies in dietary supplements.
CO 3	Appreciate the components in dietary supplements and the application.
CO4	Appreciate the regulatory and commercial aspects of dietary supplements includinghealth claims.

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