



SGT UNIVERSITY
SHREE GURU GOBIND SINGH TRICENTENARY UNIVERSITY
(UGC Approved) Gurugram, Delhi-NCR
Budhera, Gurugram-Badli Road, Gurugram (Haryana) – 122505 Ph. : 0124-2278183, 2278184, 2278185

SGT College of Pharmacy

Program Outcomes (POs)



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Programme outcomes

- PO 1. Creation of talented and skilled manpower to meet the requirement in the areas of
Pharmaceutical Sciences
- PO 2. Facilitating academia-industry interphase
- PO 3. Increased employability opportunities for students
- PO 4. Increase in number of Placement of graduating students



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Program Specific Outcomes (PSOs)



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Programme specific outcomes

Bachelor of Pharmacy

Trained, skilled and competent graduates in the area of Pharmacy and health who can resolve the industrial pharmaceutical problems by using their knowledge and critical thinking and can communicate in an effective, robust and respectful, ethical and responsible manner from a professional perspective. They also can carry out self-assessment, supplement their knowledge and adapt their approach.

Graduates will acquire adequate scientific information regarding basic principles of Pharmaceutical and Medicinal chemistry, Pharmaceutics including Cosmetology, Pharmacology and Pharmacognosy. They will also have hands on training of practical aspects of Synthesis of APIs and its intermediates along with Formulation and Development, Analysis and Quality assurance of various pharmaceutical dosage forms including those of herbal origin as per standards of official books, WHO, and other regulatory agencies.

- PSO 1. Graduate will be able to think logically and solve the problems, will develop an ability to conduct, analyze and interpret data of pharmaceutical experiments in various sectors like drug discovery, formulation development, production, quality control, quality assurance etc.) as per the needs of pharmaceutical industries.
- PSO 2. Graduates will develop an ability to visualize and work on multidisciplinary tasks. They will be able to demonstrate necessary skills (e.g. working independently, time management and organizational skills) and an adaptable, flexible and effective approach towards organizational development.
- PSO 3. Graduates will develop interpersonal skills like swaying, negotiating and working with others, conflict board and leading others through problem-solving process. They will be able to lead and function both alone and as a member of a team.
- PSO 4. Graduates will demonstrate knowledge of professional and ethical responsibilities as per pharmaceutical jurisprudence.
- PSO 5. They will retrieve, evaluate, and apply current drug information in the delivery of pharmaceutical care and assure safe and accurate preparation and dispensing.
- PSO 6. Graduates will demonstrate the impact of pharmacy knowledge on the society and also will be aware of modern healthcare issues to create awareness through interactions with others.
- PSO 7. Graduates will be able to demonstrate a high-level of understanding of the key stages in drug discovery, development, and commercialization. This will lead to the manufacturing of drugs and pharmaceuticals considering its impact on the environment and surrounding.



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- PSO 8. The graduates will swear by a code of ethics of Pharmacy Council of India in relation to community and shall act as integral part of a health care system.
- PSO 9. The graduates will acquire excellent interpersonal oral communication and writing skills for effective exchange of professional information
- PSO 10. Graduates will demonstrate the skills to use modern pharmaceutical tools, software, and equipments to analyze and solve problems.
- PSO 11. Graduates will apply theoretical and practical skills developed through classroom, laboratories and team project experiences and thus will develop confidence and will be able to i) do specialized research in the core and applied areas of pharmaceutical sciences. ii) manufacture, analyse and assure the drug based formulations. iii) promote and market the pharmaceuticals, and iv) train budding pharmacist to become self-reliant pharmacist and a health care professional.

Programme specific outcomes

Diploma in Pharmacy

- PSO 1. The professionals will develop an ability to visualize and work on multidisciplinary tasks. They will be able to demonstrate necessary skills (e.g. working independently, time management and organizational skills) and an adaptable, flexible and effective approach towards organizational development.
- PSO 2. The professionals will develop interpersonal skills like swaying, negotiating and working with others, conflict board and leading others through problem-solving process. They will be able to lead and function both alone and as a team part.
- PSO 3. The professionals will demonstrate knowledge of professional and ethical responsibilities as per pharmaceutical jurisprudence.
- PSO 4. They will retrieve, evaluate, and apply current drug information in the delivery of pharmaceutical care and assure safe and accurate preparation and dispensing.
- PSO 5. The professionals will demonstrate the impact of pharmacy knowledge on the society and also will be aware of modern healthcare issues to create awareness through interactions with others.
- PSO 6. The professionals will be able to demonstrate a high-level of understanding of the key stages in drug discovery, development, and commercialization. This will lead to the manufacturing of drugs and pharmaceuticals considering its impact on the environment and surrounding.
- PSO 7. The professionals will swear by a code of ethics of Pharmacy Council of India in relation to community and shall act as integral part of a health care system.



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- PSO 8. The professionals will acquire excellent interpersonal oral communication and writing skills for effective exchange of professional information
- PSO 9. The professionals will demonstrate the skills to use modern pharmaceutical tools, software, and equipments to analyze and solve problems.

Programme specific outcomes

Bachelor of Pharmacy (Practice)

- PSO 1. The purpose of the course is to enter the additional qualification of the registered pharmacists to the register of pharmacists.
- PSO 2. To allow the student to understand and develop data collection and reporting skills in the area of community, hospital and clinical pharmacy in particular and principles of pharmacy practice in general, the assignment work shall be carried out under the supervision of a teacher of the Academic Institution on the topic approved by the Head of the Academic Institution.
- PSO 3. Develop the professionals' skills in data collection, analysis and reporting, and interpretation.



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Course Outcomes (COs)



Course outcomes

Bachelor of Pharmacy (Programme code: 0126)

Name of the new course introduced in the last 5 years	Course code	Course outcome
Human Anatomy and Physiology I– Theory	01260112	CO 1. Students would have studied about the gross morphology, structure and functions of cell, skeletal, muscular, cardiovascular system of the human body
Human Anatomy and Physiology I– Practical	01260118	CO 2. They would have understood the various homeostatic mechanisms and their imbalances. CO 3. Students would be able to identify the different types of bones in human body. CO 4. Students would be able to identify the various tissues of different systems of human body. CO 5. Students would learn about the various experimental techniques related to physiology. CO 6. They would have learnt various techniques like blood group determination, blood pressure measurement, blood cells counting
Pharmaceutical Analysis-I – Theory	01260115	CO 1. Learning this subject content will develop the ideas with the fundamental of analytical chemistry among the pupil.
Pharmaceutical Analysis-I – Practical	01260121	CO 2. It constructs the fundamental methodology to prepare different strength of solutions. CO 3. It facilitates the fellow pupil to predict the sources of mistakes and errors. CO 4. It helps to develop the fundamentals of volumetric analytical skills. CO 5. It consolidates the basic knowledge in the principles of electrochemical analytical techniques CO 6. The student's interpretation skills will be improved by the course content in terms of choice of analytical techniques to perform the estimation of different category drugs.



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Pharmaceutics-I – Theory	01260116	CO 1. Know the history of profession of pharmacy CO 2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
Pharmaceutics-I – Practical	01260117	CO 3. Understand the professional way of handling the prescription CO 4. Preparation of various conventional dosage forms CO 5. He must know to prepare dosage forms including, internal as well as external preparations CO 6. He must be able to know and formulate biphasic liquid dosage forms such as emulsion and suspension
Pharmaceutical Inorganic Chemistry– Theory	01260113	CO 1. Well acquainted with the principles of limit tests. CO 2. Familiar with different classes of inorganic pharmaceuticals and their analysis CO 3. Identification of different anions, cations and different inorganic pharmaceuticals.
Pharmaceutical Inorganic Chemistry – Practical	01260119	CO 4. Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals CO 5. understand the medicinal and pharmaceutical importance of inorganic compounds CO 6. To have been introduced to a variety of inorganic drug classes.
Communication skills – Theory*	01260114	CO 1. Understand the behavioral needs for a Pharmacist to function effectively in the CO 2. areas of pharmaceutical operation
Communication skills – Practical	01260120	CO 3. Communicate effectively (Verbal and Non Verbal) CO 4. Effectively manage the team as a team player CO 5. Develop interview skills CO 6. Develop Leadership qualities and essentials
Remedial Biology	01260109	CO 1. Cell biology (Basic Nature of Plant cell and Animal cell)
Remedial Biology – Practical	01260111	CO 2. Classification System of both Plants & Animals CO 3. Various tissue system and organ system in plant and animals



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		<p>CO 4. Theory of evolution</p> <p>CO 5. Anatomy and Physiology of plants and animals</p>
Remedial Mathematics – Theory*	01260110	<p>CO 1. Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.</p> <p>CO 2. Create, use and analyze mathematical representations and mathematical relationships</p> <p>CO 3. Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy</p> <p>CO 4. Perform abstract mathematical reasoning</p>
Human Anatomy and Physiology II – Theory	01260210	<p>CO 1. Students would have studied about the gross morphology, structure and functions of nervous, respiratory, urinary and reproductive systems in the human body.</p> <p>CO 2. They would have studied in detailed about energy and metabolism.</p> <p>CO 3. Students would able to identify the various organs of different systems of human body.</p> <p>CO 4. They would have performed and learnt about the experiments like neurological reflex, body temperature measurement</p> <p>CO 5. They would have studied elaborate on interlinked mechanisms in the maintenance of normal functioning of human body</p> <p>CO 6. They would have learnt and performed the experiments like Olfaction, gustation reflex and eye sight</p> <p>CO 7. Detail the gross morphology and detail structure of the organ of endocrine, nervous, digestive, respiratory, urinary and reproductive system.</p> <p>CO 8. Explain the physiology of endocrine, nervous, digestive, respiratory, urinary and reproductive system.</p> <p>CO 9. Describe the neuro-endocrine and other regulatory mechanism for endocrine, nervous, digestive, respiratory, urinary and reproductive physiology.</p>
Human Anatomy and Physiology II – Practical	01260215	



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		<p>CO 10. Appreciate coordinated working pattern and interlinked mechanisms in the maintenance of normal execution (homeostasis) of human body.</p> <p>CO 11. Determine vital capacity, tidal volume, body temperature and basal mass index.</p> <p>CO 12. Demonstrate general neurological examinations and feedback mechanisms.</p>
Pharmaceutical Organic Chemistry I – Theory	01260211	<p>CO 1. Write the structure, name of organic compound</p> <p>CO 2. Knowledge about the type of isomerism</p> <p>CO 3. Write the reaction, name the reaction and orientation of reactions</p>
Pharmaceutical Organic Chemistry I – Practical	01260216	<p>CO 4. Account for reactivity/stability of compounds,</p> <p>CO 5. Identify/ confirm unknown organic compound</p> <p>CO 6. Knowledge about the naming reactions of carbonyl compounds</p> <p>CO 7. To perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration, etc.</p>
Biochemistry – Theory	01260212	<p>CO 1. To understand the importance of metabolism of substrates.</p> <p>CO 2. Will acquire chemistry and biological importance of biological macromolecules.</p>
Biochemistry – Practical	01260217	<p>CO 3. To get knowledge in qualitative and quantitative estimation of biological macromolecules.</p> <p>CO 4. To know the interpretation of data emanating from a Clinical Test Lab.</p> <p>CO 5. To know how physiological states influence the structures and re-activities of biomolecules.</p> <p>CO 6. To understand the basic principles of protein and polysaccharide structure.</p>
Pathophysiology – Theory	01260213	<p>CO 1. Describe the etiology and pathogenesis of the selected disease states</p> <p>CO 2. Knowledge of signs and symptoms of the diseases</p> <p>CO 3. Identify the complications of the diseases.</p> <p>CO 4. Know most commonly encountered pathophysiological state(s) and/or disease</p>



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		mechanism(s), as well as any clinical testing requirements
Computer Applications in Pharmacy – Theory *	01260214	CO 1. Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement CO 2. Design and develop solutions to analyze pharmaceutical problems using computers.
Computer Applications in Pharmacy – Practical	01260218	CO 3. Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical related activities CO 4. Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy.
Environmental sciences – Theory *	01260219	CO 1. The students should be able to understand our environment, its biotic and abiotic components, renewable and non-renewable natural wealth and the multidisciplinary nature of studies. CO 2. The students should be able to know, know and explain about the natural resources like forest, water, minerals, food, energy and land, the problems associated with them and role of an individual in their conservation. CO 3. The students should be able to understand and explain the concept of an ecosystem, different types of ecosystems like forest, grassland, desert and aquatic, their structure, functions and characteristics. CO 4. The students should be able to know, understand and explain about various environmental pollutions like soil, water and air and preventive measures for them.
Pharmaceutical Organic Chemistry II – Theory	01260310	CO 1. Basic knowledge regarding general methods of preparation of organic compounds. CO 2. Understand the reactions of some organic compounds.
Pharmaceutical Organic Chemistry	01260314	CO 3. To know Reactivity of organic compounds. CO 4. Special emphasis on mechanisms and orientation



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II – Practical		of chemical reactions. CO 5. To get knowledge in heterocyclic compounds. CO 6. To acquire knowledge about the electrophilic and nucleophilic reactions.
Physical Pharmaceutics I – Theory	01260311	CO 1. State the physicochemical properties of drug molecules, pH, and solubility CO 2. Explain the role of surfactants, interfacial phenomenon and thermodynamics
Physical Pharmaceutics I – Practical	01260315	CO 3. Describe the flow behavior of fluids and concept of complexation CO 4. Analyze the chemical stability tests of various drug products CO 5. Understand the physical properties of solutions, buffers, isotonicity, disperse systems and rheology. CO 6. Understand of physicochemical properties of drugs including solubility, distribution, adsorption, and stability. CO 7. Have basic knowledge of pharmaceutical suspensions and colloids. CO 8. Have basic understanding of the pharmaceutical applications of various physical CO 9. Principles such as lyophilization, aerosols, condensed systems, and phase diagram.
Pharmaceutical Microbiology – Theory	01260312	CO 1. Students will be able to acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology. CO 2. Students will acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.
Pharmaceutical Microbiology – Practical	01260316	CO 3. Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing. CO 4. Students will demonstrate isolation of and



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		<p>identification of microbes.</p> <p>CO 5. Students can able to design microbiology laboratory considering all the aspects of safety</p> <p>CO 6. Students will acquire knowledge about validating the microbiological equipment and reporting the observations</p>
Pharmaceutical Engineering – Theory	01260313	<p>CO 1. To know various unit operations used in Pharmaceutical industries.</p> <p>CO 2. To understand the material handling techniques.</p> <p>CO 3. To perform various processes involved in pharmaceutical manufacturing process.</p>
Pharmaceutical Engineering – Practical	01260317	<p>CO 4. To carry out various test to prevent environmental pollution.</p> <p>CO 5. To appreciate and comprehend significance of plant lay out design for optimum use of resources.</p> <p>CO 6. To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries</p>
Pharmaceutical Organic Chemistry III– Theory	01260410	<p>CO 1. To acquire the knowledge and understanding of the basic experimental principles of heterocyclic chemistry.</p> <p>CO 2. To draw the structures and synthesize simple pharmaceutically active organic compounds having five and six membered heterocyclic compounds.</p> <p>CO 3. To describe detailed mechanisms for common naming reactions.</p> <p>CO 4. To be able to run experimental techniques, procedures and safe laboratory practices.</p> <p>CO 5. Stereo-chemical features including conformation and stereo electronic effects; Geometrical isomers</p>
Medicinal Chemistry I – Theory	01260411	<p>CO 1. Helps in correlating between pharmacology of a disease and its mitigation or cure.</p> <p>CO 2. To understand the drug metabolic pathways, adverse effect and therapeutic value of drugs</p>
Medicinal Chemistry I – Practical	01260415	<p>CO 3. To know the structural activity relationship of different class of drugs.</p> <p>CO 4. Well acquainted with the synthesis of some</p>



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		<p>important class of drugs.</p> <p>CO 5. Knowledge about the mechanism pathways of different class of medicinal compounds.</p> <p>CO 6. To understand the chemistry of drugs with respect to their pharmacological activity.</p>
Physical Pharmaceutics II – Theory	01260412	<p>CO 1. State the physicochemical properties of drug molecules, pH, and solubility</p> <p>CO 2. Explain the role of surfactants, interfacial phenomenon and thermodynamics</p>
Physical Pharmaceutics II – Practical	01260416	<p>CO 3. Describe the flow behavior of fluids and concept of complexation</p> <p>CO 4. Analyze the chemical stability tests of various drug products</p> <p>CO 5. Understand the physical properties of solutions, buffers, isotonicity, disperse systems and rheology.</p> <p>CO 6. Understand of physicochemical properties of drugs including solubility, distribution, adsorption, and stability.</p> <p>CO 7. Have basic knowledge of pharmaceutical suspensions and colloids.</p> <p>CO 8. Have basic understanding of the pharmaceutical applications of various physical</p> <p>CO 9. Principles such as lyophilization, aerosols, condensed systems, and phase diagram.</p>
Pharmacology I – Theory	01260413	<p>CO 1. Students would have understood the pharmacological actions of different categories of drugs</p>
Pharmacology I – Practical	01260417	<p>CO 2. They would have studied in detailed about mechanism of drug action at organ system/sub cellular/ macromolecular levels.</p> <p>CO 3. They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various diseases.</p> <p>CO 4. They would have observed the effect of drugs on animals by simulated experiments</p> <p>CO 5. They would got an idea about correlation of</p>



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		<p>pharmacology with other bio medical sciences.</p> <p>CO 6. They would have understood the signal transduction mechanism of various receptors</p>
Pharmacognosy and Phytochemistry I – Theory	01260414	<p>This course is one of the most advanced introductions in Herbal Medicines that is offered. Will learn and get experience about:</p> <p>CO 1. Herbs, and their Science.</p> <p>CO 2. Classification of Medicinal Plants, Phytochemistry, Carbohydrates, Lipids,</p> <p>CO 3. Terpenes, Polyphenols, Alkaloids, Pharmacology, Toxicity, Formulations and Preparations of Herbal Medicines.</p> <p>CO 4. How herbs influence our physiology and can be helpful against several disorders.</p> <p>CO 5. Relations between Phyto-therapy and the Elderly, Phytotherapy and Children, Understanding Herbal Action, and Understanding the Materia Medica.</p> <p>CO 6. The recognition of medicinal plants, identification of adulteration and Contamination.</p> <p>CO 7. Ethnobotany & Ethnopharmacology in drug discovery process.</p> <p>CO 8. DNA Finger printing.</p>
Pharmacognosy and Phytochemistry I – Practical	01260418	
Medicinal Chemistry II – Theory	01260510	<p>CO 1. Helps in correlating between pharmacology of a disease and its mitigation or cure.</p> <p>CO 2. To write the chemical synthesis of some drugs.</p> <p>CO 3. To know the structural activity relationship of different class of drugs.</p> <p>CO 4. Knowledge about the mechanism pathways of different class of medicinal compounds.</p> <p>CO 5. To acquire knowledge about the chemotherapy for cancer.</p> <p>CO 6. To understand the chemistry of drugs with respect to their pharmacological activity.</p>
Industrial Pharmacy I – Theory	01260511	<p>CO 1. After successful completion of the course student will be able to understand the various drug delivery system and its mechanisms.</p>



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<p>Industrial Pharmacy I – Practical</p>	<p>01260515</p>	<p>CO 2. Students will learn advanced drug delivery system early stage.</p> <p>CO 3. Developing a preparation of the drug which is both stable and acceptable to the patient.</p> <p>CO 4. They know very well about orally administered drugs, injectables, aerosol and semisolid preparations with standard protocols.</p> <p>CO 5. Formulated drugs are stored in a suitable container closure system for extended periods of time.</p> <p>CO 6. Also they know the stability study and its standard evaluation procedure for better storage conditions.</p>
<p>Pharmacology II – Theory</p>	<p>01260512</p>	<p>CO 1. Students would have understood the mechanism of drug action and its relevance in the treatment of different diseases</p>
<p>Pharmacology II – Practical</p>	<p>01260516</p>	<p>CO 2. They would be trained with isolation of different organs/tissues from the laboratory animals by simulated experiments</p> <p>CO 3. They would have observed the various receptor actions using isolated tissue preparation</p> <p>CO 4. Students would appreciate the correlation of pharmacology with related medical sciences</p> <p>CO 5. They would have understood the cell communication mechanism</p> <p>CO 6. They would appreciate the newer targets of several disease conditions for treatment.</p>
<p>Pharmacognosy and Phytochemistry II– Theory</p>	<p>01260513</p>	<p>This course is one of the most advanced introductions in Herbal Medicines that is offered. Will learn and get experience about</p> <p>CO 1. Herbs, and their Science.</p> <p>CO 2. Classification of Medicinal Plants, Phytochemistry,</p>
<p>Pharmacognosy and Phytochemistry II – Practical</p>	<p>01260517</p>	<p>Carbohydrates, Lipids,</p> <p>CO 3. Terpenes, Polyphenols, Alkaloids, Pharmacology, Toxicity, Formulations and Preparations of Herbal Medicines.</p> <p>CO 4. How herbs influence our physiology and can be helpful against several disorders.</p>



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		<p>CO 5. RelationsbetweenPhyto-therapy and the Elderly, Phytotherapy and Children, Understanding Herbal Action, and Understanding the MateriaMedica.</p> <p>CO 6. The recognition of medicinal plants, identification of adulteration and Contamination.</p> <p>CO 7. Ethnobotany & Ethnopharmacology in drug discovery process.</p> <p>CO 8. DNA Finger printing.</p>
Pharmaceutical Jurisprudence – Theory	01260514	<p>CO 1. Know the Pharmaceutical legislations and their implications in the development and marketing</p> <p>CO 2. Know various Indian pharmaceutical Acts, Laws and schedule</p> <p>CO 3. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals</p> <p>CO 4. Know code of ethics during the pharmaceutical practice</p>
Medicinal Chemistry III – Theory	01260610	<p>CO 1. To develop an understanding of the physico-chemical properties of drugs.</p> <p>CO 2. To understand how current drugs were developed by using pharmacophore modeling and docking technique.</p>
Medicinal chemistry III – Practical	01260616	<p>CO 3. To acquire knowledge in the chemotherapy for cancer and microbial diseases and different anti-viral agents.</p> <p>CO 4. To acquire knowledge about the mechanism pathways of different class of medicinal compounds.</p> <p>CO 5. To have been introduced to a variety of drug classes and some pharmacological properties.</p> <p>CO 6. To acquire knowledge on thrust areas for further research.</p>
Pharmacology III – Theory	01260611	<p>CO 1. Students would have studied elaborately on mechanism of drug action and its relevance in the treatment of different infectious diseases</p>
Pharmacology III –	01260617	<p>CO 2. They comprehended the principles of toxicology</p>



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Practical		and treatment of various poisonings and CO 3. They came across the methods of toxicity studies CO 4. They studied about symptoms of several poisonings CO 5. They studied about treatment of several poisonings CO 6. Students understood the toxicity profile of each drugs
Herbal Drug Technology – Theory	01260612	At the end of the course, the graduate will have acquired the following know-how and skills- CO 1. The recognition, collection and preservation of medicinal plants.
Herbal Drug Technology – Practical	01260618	CO 2. Analyses and dosage of active ingredients. CO 3. The biological effects of medicinal plants. CO 4. The toxicological aspects of active ingredients and finished products. CO 5. The study, design, management, control and conduction of the processing systems of medicinal plants and derivatives. CO 6. Management of quality of medicinal plant products and derivatives. CO 7. The possible application of medicinal plants and derivatives as health Products, including the food and cosmetics sectors. CO 8. Technical-scientific consulting in the specialized press for the herbal sector, the promotion of information in the medicinal plants and derivatives sector.
Biopharmaceutics and Pharmacokinetics – Theory	01260613	After successful completion of the course student will be able to: CO 1. Understand the concept of ADME of drug in human body. CO 2. Determine the various pharmacokinetic parameters from either plasma concentration or urinary excretion data for drug CO 3. Apply the various regulations related to developing BA-BE study protocol for the new drug molecule.
Pharmaceutical	01260614	CO 1. Students will understand the various techniques



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<p>Biotechnology – Theory</p>		<p>used in modern biotechnology.</p> <p>CO 2. Students can design research strategy with step-by-step instructions to address a research problem</p> <p>CO 3. Students can able to provide examples of current applications of biotechnology and advances in the different areas like medical, microbial, environmental, bioremediation, agricultural, plant, animal, and forensic</p> <p>CO 4. Students can explain the concept and application of monoclonal antibody technology</p> <p>CO 5. Students can demonstrate and Provide examples on how to use microbes and mammalian cells for the production of pharmaceutical products</p> <p>CO 6. Students can able to explain the general principles of generating transgenic plants, animals and microbes</p>
<p>Quality Assurance –Theory</p>	<p>01260615</p>	<p>CO 1. The students understand the importance of quality in pharmaceutical products.</p> <p>CO 2. The students is explored into importance of Good practices such as GMP, GLP ect.</p> <p>CO 3. The factors affecting the quality of pharmaceutical is explored.</p> <p>CO 4. He understands the regulatory aspects of pharmaceutical taught to the student.</p> <p>CO 5. The process involved in manufacturing of pharmaceuticals different section/department and activity is learnt.</p> <p>CO 6. The various documentation process is highlighted to the student.</p>
<p>Instrumental Methods of Analysis – Theory</p>	<p>01260710</p>	<p>CO 1. The basic theoretical knowledge of the instrumentation techniques available.</p> <p>CO 2. Theoretically understand the aspects of separation for multi components.</p>
<p>Instrumental Methods of Analysis –</p>	<p>01260715</p>	<p>CO 3. Practical skills for the analysis of drugs and excipients using various instrumentation techniques.</p>



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Practical		<p>CO 4. To make accurate analysis and report the results in defined formats.</p> <p>CO 5. To learn documentation and express the observations with clarity.</p> <p>CO 6. To understand the professional and safety responsibilities for working in the analysis laboratory.</p>
Industrial Pharmacy II – Theory	01260711	<p>CO 1. To know the various pharmaceutical dosage forms and their manufacturing techniques.</p> <p>CO 2. To know various considerations in development of pharmaceutical dosage forms</p> <p>CO 3. To formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.</p>
Pharmacy Practice – Theory	01260712	<p>CO 1. Students will demonstrate knowledge of and ability to use principles of therapeutics, quality improvement, communication, economics, health behavior, social and administrative aspects, health policy and legal issues in the practice of pharmacy.</p> <p>CO 2. Students will use knowledge of drug distribution methods in hospital and apply it in the practice of pharmacy.</p> <p>CO 3. Students will effectively apply principles of drug store management and inventory control to medication use.</p> <p>CO 4. Students will provide patient-centered care to diverse patients using the best available evidence and monitor drug therapy of patient through medication chart review, obtain medication history interview and counsel the patients, identify drug related problems.</p> <p>CO 5. Students will engage in innovative activities by making use of the knowledge of clinical trials</p> <p>CO 6. Students will exhibit professional ethics by producing safe and appropriate medication use throughout society</p>
Novel Drug	01260713	<p>CO 1. Acquire knowledge about fundamental concepts</p>



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<p>Delivery System – Theory</p>		<p>and factors influencing the design and performance of sustained/controlled drug delivery system and able to describe designing and fabrication of novel drug delivery system for oral controlled release.</p> <p>CO 2. Know and understand the need, application and fabrication of ocular controlled drug delivery systems and devices</p> <p>CO 3. Understand and describe formulation and evaluation aspects of parenteral controlled drug delivery systems and carriers for targeted drug delivery system.</p> <p>CO 4. Know and explain formulation and evaluation aspects of sterile dosage forms and ophthalmic preparation with emphasis on compounding, processing, filtration, sealing, sterilization, packaging and labeling.</p> <p>CO 5. Prepare and evaluate various solid, semisolid and cosmetic formulation.</p> <p>CO 6. Carry out preparation and evaluation of various sterile dosage form such as lvp , svp and ophthalmic preparation.</p>
<p>Practice School</p>	<p>01260714</p>	<p>In this program the students are sent to various Pharmaceutical Organizations to learn</p> <p>CO 1. Manufacturing procedures as per CGMP</p> <p>CO 2. To have hand on training on Modern Analytical Instrumentations</p> <p>CO 3. To develop analytical methods for validation</p> <p>CO 4. To understand Quality Assurance concepts w. r. t. documentations</p> <p>CO 5. To learn and adopt various Marketing and Selling skills</p> <p>CO 6. To learn Community pharmacy techniques</p>
<p>Biostatistics and Research Methodology</p>	<p>01260809</p>	<p>CO 1. Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment)</p> <p>CO 2. Know the various statistical techniques to solve statistical problems</p>



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		CO 3. Appreciate statistical techniques in solving the problems.
Social and Preventive Pharmacy	01260810	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
Pharma Marketing Management	01260811	CO 1. The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.
Pharmaceutical Regulatory Science	01260812	CO 2. Know about the process of drug discovery and development CO 3. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals CO 4. Know the regulatory approval process and their registration in Indian and international markets
Pharmacovigilance	01260813	At completion of this paper it is expected that students will be able to (know, do, and appreciate): CO 1. Why drug safety monitoring is important? CO 2. History and development of pharmacovigilance CO 3. National and international scenario of pharmacovigilance CO 4. Dictionaries, coding and terminologies used in pharmacovigilance CO 5. Detection of new adverse drug reactions and their assessment CO 6. International standards for classification of diseases and drugs CO 7. Adverse drug reaction reporting systems and communication in pharmacovigilance CO 8. Methods to generate safety data during pre clinical, clinical and post approval phases of drugs' life cycle CO 9. Drug safety evaluation in paediatrics, geriatrics,



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		<p>pregnancy and lactation</p> <p>CO 10. Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India</p> <p>CO 11. ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning</p> <p>CO 12. CIOMS requirements for ADR reporting</p> <p>CO 13. Writing case narratives of adverse events and their quality.</p>
Quality Control and Standardization of Herbals	01260814	<p>CO 1. know WHO guidelines for quality control of herbal drugs</p> <p>CO 2. know Quality assurance in herbal drug industry</p> <p>CO 3. know the regulatory approval process and their registration in Indian and international markets</p> <p>CO 4. appreciate EU and ICH guidelines for quality control of herbal drugs</p>
Computer Aided Drug Design	01260815	<p>Upon completion of the course, the student shall be able to understand</p> <p>CO 1. Design and discovery of lead molecules</p> <p>CO 2. The role of drug design in drug discovery process</p> <p>CO 3. The concept of QSAR and docking</p> <p>CO 4. Various strategies to develop new drug like molecules.</p> <p>CO 5. The design of new drug molecules using molecular modeling software</p>
Cell and Molecular Biology	01260816	<p>Upon completion of the subject student shall be able to;</p> <p>CO 1. Summarize cell and molecular biology history.</p> <p>CO 2. Summarize cellular functioning and composition.</p> <p>CO 3. Describe the chemical foundations of cell biology.</p> <p>CO 4. Summarize the DNA properties of cell biology.</p> <p>CO 5. Describe protein structure and function.</p> <p>CO 6. Describe cellular membrane structure and function.</p> <p>CO 7. Describe basic molecular genetic mechanisms.</p> <p>CO 8. Summarize the Cell Cycle</p>
Cosmetic Science	01260817	<p>Upon completion of the subject student shall be able to understand</p> <p>CO 1. Evolution of cosmeceuticals</p>



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		<p>CO 2. Classification and applications of cosmetic excipients</p> <p>CO 3. Skin care cosmetics</p> <p>CO 4. Hair care cosmetics</p> <p>CO 5. Oral care cosmetics</p> <p>CO 6. Evaluation of cosmetics</p>
Experimental Pharmacology	01260818	<p>Upon completion of the course the student shall be able to,</p> <p>CO 1. Appreciate the applications of various commonly used laboratory animals.</p> <p>CO 2. Appreciate and demonstrate the various screening methods used in preclinical research</p> <p>CO 3. Appreciate and demonstrate the importance of biostatistics and research methodology</p> <p>CO 4. Design and execute a research hypothesis independently</p>
Advanced Instrumentation Techniques	01260819	<p>Upon completion of the course the student shall be able to</p> <p>CO 1. Understand the advanced instruments used and its applications in drug analysis</p> <p>CO 2. Understand the chromatographic separation and analysis of drugs.</p> <p>CO 3. Understand the calibration of various analytical instruments</p> <p>CO 4. Know analysis of drugs using various analytical instruments.</p>
Project Work (Research Work/ Field work)	01260820	<p>CO 1. Practical aspects of subject specialization</p> <p>CO 2. Research and review of specialized subjects like drug design, NDDS, Herbal drug technology, clinical pharmacy, computer aided drug design etc.</p> <p>CO 3. Field survey regarding drug utilization, abuse and marketing, pharmacovigilance etc.</p>

Course outcomes

Diploma in Pharmacy (Programme code: 0127)

Name of the new course introduced in the last 5 years	Course code	Course outcome
Pharmaceutics-I	01270101	CO 1. By the end of this course, the students will



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Pharmaceutics-I- Practical	01270107	<p>be able to understand about various dosage forms, their uses, different ayurvedic formulations, immunological products.</p> <p>CO 2. In addition, they will gain a deep knowledge regarding various systems of weight measurement, percentage calculation, importance of packing, various aseptic technique used for pharmaceutical preparation and importance of pharmaceutics in the field of pharmacy. Students will be able to understand about various dosage forms, their formulation design, uses, packaging and labelling.</p>
Pharmaceutical Chemistry-1	01270102	After completion of the course, student will be able to understand-
Pharmaceutical Chemistry-1 - Practical	01270108	<p>CO 1. different reactions of inorganic compounds, importance of physiological balance and the cations and anions used to regulate them,</p> <p>CO 2. importance of radiopharmaceuticals, different methods which are used to control the quality of dosage forms, impurities in pharmaceuticals and limit tests</p>
Pharmacognosy-1	01270103	The students will be able to explain-
Pharmacognosy-1- Practical	01270109	<p>CO 3. The role of natural products as the source of many drugs and pharmaceutical ingredients, their common adulterations and quality control parameters</p> <p>CO 4. Various drugs morphological characters, and perform physical and chemical test evaluation</p>
Biochemistry & Clinical Pathology	01270104	<p>Students will be able to-</p> <p>CO 1. Recognize how fundamental chemical</p>



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<p>Biochemistry & Clinical Pathology- Practical</p>	<p>01270110</p>	<p>principles and reactions are utilized in biochemical processes and must be able to write and speak clearly on chemical and biochemical topics.</p> <p>CO 2. Recognize how biochemical reactions are not special, but follow fundamental chemical principles to achieve viability.</p> <p>CO 3. Judge whether a proposed or hypothetical reaction is consistent with the general framework of catabolic and anabolic metabolism.</p> <p>CO 4. Able to work with clinicians,</p> <p>CO 5. Determine the role of the laboratory in specific situations to optimize patient safety.</p> <p>CO 6. Characterise blood and urine samples.</p> <p>CO 7. Give injections through various routes.</p> <p>CO 8. Work with clinicians, to determine the role of the laboratory in specific situations to optimize patient safety.</p>
<p>Human Anatomy & Physiology</p> <p>Human Anatomy & Physiology- Practical</p>	<p>01270105</p> <p>01270111</p>	<p>After completion students can-</p> <p>CO 1. Recognize and define a variety to terms specific to the human body.</p> <p>CO 2. Analyze and describe the structures and functions of human anatomy and physiology from a regional perspective for the following regions: head and neck, thoracic, and upper and lower extremities.</p> <p>CO 3. Demonstrate competency in identifying the major skeletal muscles, their actions, origins, insertions, and peripheral nerves.</p> <p>CO 4. Demonstrate competency in identifying the major structures and function of the gross anatomy of the central nervous system and plexuses.</p>
<p>Health Education and</p>	<p>01270106</p>	<p>Students can-</p>



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Community Pharmacy		<p>CO 1. Understand the concepts of health, nutritional values, first aids and family planning.</p> <p>CO 2. Understand the basic principles of diagnosis and management of several communicable and non-communicable diseases.</p>
Pharmaceutics-II Pharmaceutics-II Practical	01270201 01270207	<p>Students will be able-</p> <p>CO 1. To understand about compounding and dispensing of different pharmaceutical formulations based on different dosage form, about dispensing pharmacy, prescription, parts and handling of prescription, types of incompatibility in prescription, posology, factors which effects dose of drugs and different methods which are used to control the quality of different dosage forms.</p>
Pharmaceutical Chemistry-II Pharmaceutical Chemistry-II - Practical	01270202 01270208	<p>Students will be able to-</p> <p>CO 1. Name a medicinal drug according to IUPAC system.</p> <p>CO 2. Make a bridge between basic and more advanced pharmaceutical chemistry knowledge.</p> <p>CO 3. Makes connection from chemical principles to the structures and functions of biological molecules.</p> <p>CO 4. Recognize the medicinal on the basis of structure and official preparation.</p> <p>CO 5. Generate ability to speak and write about pharmacological property of drugs.</p> <p>CO 6. Prepare organic compounds and do elemental and functional group analysis by the help of various detection tests.</p> <p>CO 7. Identify certain groups of drugs like barbiturates, sulfonamides,</p>



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		phenothaziems etc. included in I. P. with help of official tests
Pharmacology & Toxicology	01270203	After acquiring knowledge the student must be able to-
Pharmacology-- Practical	01270209	CO 1. Tell which drug is used in what type of ailment and what are the side effects or unintentional actions of the drug. CO 2. Deal with the toxicity of drugs i.e. what should be done immediately if poisoning access. CO 3. Evaluate the pharmacological effects of drugs using computer based softwares. CO 4. Select suitable animals in the pharmacological experiments.
Pharmaceutical Jurisprudence	01270204	Students should be able to- CO 1. Understand pharmaceutical legislation in India; students may get deep knowledge about professional and pharmaceutical code and ethics, about pharmacist's oath, about constituent and functions pharmacy council of India and state pharmacy council, about general study of the Schedules according to drug and cosmetics act and also come to know about objectives, offences and penalties, functions of the drug and magic remedies (objectionable advertisement) act, narcotic drugs and psychotropic substances act, latest drugs (price control) order, poisons act, medicinal and toilet preparations (excise duties) act, medical termination of pregnancy act.
Drug Stores and Business Management	01270205	This subject outcomes- CO 1. Increase the selling efforts and intensity by dealers as well as sales personnel. CO 2. Call the attention to new products. Inform



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		the buyers about the new brand and new packaging. CO 3. Perform cost of reaching an audience.
Hospital and Clinical Pharmacy	01270206	By the end of this course, the students will be able to-
Hospital and Clinical Pharmacy- Practical	01270210	CO 1. Understand about various function of hospital and hospital pharmacy, various in-patient and out-patients services, manufacturing within hospital and special precautions related to sterile manufacturing process, different surgical instrument and surgical dressing used in hospital, data collection data storage, various parts of prescription, drug interaction and adverse drug reactions, toxicity due to insecticides, heavy metals, poisons, narcotic drugs and barbiturates. CO 2. Gain a deep knowledge regarding to various diseases their causative agents, diseases cycle, laboratory protocols for detection and finally the methods of control and presentation of diseases.

Course outcomes

Bachelor of Pharmacy (Practice) (Programme code: 0128)

Name of the new course introduced in the last 5 years	Course code	Course outcome
Pathophysiology and pharmacotherapeutics-I	01280101	CO 1. Understand the anatomy and physiology of the respective system CO 2. Understand the disease process CO 3. Know the signs and symptoms of the disease.
Pathophysiology and pharmacotherapeutics-I - Practical	01280107	CO 4. Appreciate the various therapeutic regimens with their advantages and disadvantages.
Pathophysiology and	01280102	CO 1. Understand the anatomy and physiology of



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Pharmacotherapeutics -II Pathophysiology and Pharmacotherapeutics -II - Practical	01280108	<p>respective system</p> <p>CO 2. Understand the disease process</p> <p>CO 3. Know the signs and symptoms of the disease.</p> <p>CO 4. Appreciate the various therapeutic regimens with their advantages and disadvantages.</p>
Pharmacy Practice -I Pharmacy Practice -I - Practical	01280103 01280109	<p>CO 1. Understand the professional roles of pharmacists in community, hospital and clinical pharmacy areas.</p> <p>CO 2. Understand the professional responsibilities of the pharmacists.</p> <p>CO 3. Provide the intended services.</p>
Pharmacy Practice -II Pharmacy Practice -II - Practical	01280104 01280110	<p>CO 1. Understand the professional roles of pharmacists in community, hospital and clinical pharmacy areas.</p> <p>CO 2. Understand the professional responsibilities of the pharmacists.</p> <p>CO 3. Provide the intended services.</p>
Applied Pharmaceutics Applied Pharmaceutics- Practical	01280105 01280111	<p>CO 1. Understand the formulation principles of various dosage forms</p> <p>CO 2. Understand the basic principles of stability, storage and administration of various dosage forms</p> <p>CO 3. Learn about novel drug delivery systems</p> <p>CO 4. Understand various pharmacokinetic pathways and optimize the drug therapy.</p> <p>CO 5. Understand Pro Drugs concept.</p>
Social Pharmacy- I Social Pharmacy- I - Practical	01280106 01280112	<p>CO 1. Understand the social responsibility of the pharmacists in the society</p> <p>CO 2. Understand the health policies</p> <p>CO 3. Provide health care services to patients.</p>
Pathophysiology and pharmacotherapeutics- III Pathophysiology and	01280201	<p>CO 1. Understand the anatomy and physiology of the respective system</p> <p>CO 2. Understand the disease process</p> <p>CO 3. Know the signs and symptoms of the disease.</p> <p>CO 4. Appreciate the various therapeutic regimens with</p>



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pharmacotherapeutics- III - Practical	01280207	their advantages and disadvantages
Pathophysiology and Pharmacotherapeutics -IV	01280202	CO 1. Understand the anatomy and physiology of the respective system CO 2. Understand the disease process CO 3. Know the signs and symptoms of the disease. CO 4. Appreciate the various therapeutic regimens with their advantages and disadvantages
Pathophysiology and Pharmacotherapeutics -IV - Practical	01280208	
Pharmacy Practice -III	01280203	CO 1. Understand the professional roles of pharmacists in community, hospital and clinical pharmacy areas. CO 2. Understand the professional responsibilities of the pharmacists. CO 3. Provide the intended services.
Pharmacy Practice -III - Practical	01280209	
Pharmacy Practice -IV	01280204	CO 1. Understand the professional roles of pharmacists in community, hospital and clinical pharmacy areas. CO 2. Understand the professional responsibilities of the pharmacists. CO 3. Provide the intended services.
Pharmacy Practice -IV - Practical	01280210	
Pharmaceutical Jurisprudence	01280205	CO 1. Understand various concepts of the pharmaceutical legislation in India CO 2. Know various rules drafted in Drug and Cosmetic Act, Pharmacy Act, NDPS CO 3. Acts, relevant to pharmacy practice. CO 4. Know the Consumer Protection Act, PFA Act, DPCO CO 5. Understand the labelling requirements and packaging guidelines for drugs and cosmetics
Pharmaceutical Jurisprudence - Practical	01280211	
Social Pharmacy- II	01280206	CO 1. Understand the social responsibility of the pharmacists in the society CO 2. Provide professional services to the patients.
Social Pharmacy- II- Practical	01280212	