

**SAMSKRUTI COLLEGE OF PHARMACY**  
(Kondapur (V), Ghatkesar (M), Medchal Dist.)

**2.6.1.** Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution (Stated and Displayed in Website of the Institution).

**PROGRAM OUTCOMES (POs)**

**1. Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.

**2. Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

**3. Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.

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

**5. Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.

**6. Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

**7. Pharmaceutical Ethics:** Honor personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

**8. Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

**9. The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

**10. Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**11. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-asses and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

1. The students shall be able to apply the knowledge and skill gained from various subjects and the aptitude developed throughout the course of the program in performing a job either independently or as a member of a team in various fields of pharmacy profession.

2. The students shall be able to make an initiation and achieve an innovation by properly integrating the input from various resources either independently or as a member of a team in various fields of pharmacy profession for betterment of the quality of life of the patients in the society.

## COURSE OUTCOMES (COs)

**B.Pharmacy 1<sup>st</sup> year-1<sup>st</sup> Semester:** University Regulation – R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PS101</b>	<b>HUMAN ANATOMY AND PHYSIOLOGY I</b>	<b>CO 1</b> -Explain the gross morphology, structure, and functions of various organs of the human body. <b>CO 2</b> -Describe the various homeostatic mechanisms and their imbalances. <b>CO 3</b> -Identify the various tissues and organs of different systems of human body. <b>CO 4</b> -Perform the various experiments related to special senses and nervous system. <b>CO 5</b> -Appreciate coordinated working pattern of different organs of each system.
<b>PS102</b>	<b>PHARMACEUTICAL ANALYSIS I</b>	<b>CO 1</b> - understand the principles of volumetric and electro chemical analysis. <b>CO2</b> -carryout various volumetric and electrochemical titrations <b>CO3</b> -develop analytical skills
<b>PS103</b>	<b>PHARMACEUTICS I</b>	<b>CO1</b> - Know the history of profession of pharmacy. <b>CO2</b> - Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations. <b>CO3</b> -Understand the professional way of handling the prescription. <b>CO4</b> -Preparation of various conventional dosage forms.
<b>PS104</b>	<b>PHARMACEUTICAL INORGANIC CHEMISTRY-I</b>	<b>CO1</b> - know the sources of impurities and methods to determine the impurities in inorganic drugs and

		Pharmaceuticals. <b>CO2</b> -Understand the medicinal and pharmaceutical importance of inorganic compounds.
<b>HS105</b>	<b>COMMUNICATION SKILLS</b>	<b>CO1</b> - Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation. <b>CO2</b> - Communicate effectively (Verbal and Non Verbal). <b>CO3</b> -Effectively manage the team as a team player. <b>CO4</b> -Develop interview skills. <b>CO5</b> -Develop Leadership qualities and essentials.
<b>BS106</b>	<b>REMEDIAL BIOLOGY</b>	<b>CO1</b> - know the classification and salient features of five kingdoms of life. <b>CO2</b> - understand the basic components of anatomy & physiology of plant. <b>CO3</b> -know understand the basic components of anatomy & physiology animal with special reference to human.
<b>BS107</b>	<b>REMEDIAL MATHEMATICS</b>	<b>CO1</b> -Know the theory and their application in Pharmacy. <b>CO2</b> - Solve the different types of problems by applying theory. <b>CO3</b> -Appreciate the important application of mathematics in Pharmacy.

**B.Pharmacy 1<sup>st</sup> year-2<sup>nd</sup> Semester:** University Regulation – R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PS201</b>	<b>HUMAN ANATOMY AND PHYSIOLOGY II</b>	<b>CO1</b> - Explain the gross morphology, structure, and functions of various organs of the human body. <b>CO2</b> - Describe the various homeostatic mechanisms and their imbalances. <b>CO3</b> -Identify the various tissues and organs of different systems of human body. <b>CO4</b> -Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume. <b>CO5</b> - Appreciate coordinated working pattern of different organs of each system. <b>CO6</b> -Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.
<b>PS202</b>	<b>PHARMACEUTICAL ORGANIC CHEMISTRY I</b>	<b>CO1</b> - Write the structure, name and the type of isomerism of the organic compound. <b>CO2</b> -Write the reaction, name the reaction and orientation of reactions. <b>CO3</b> -Account for reactivity/stability of compounds. <b>CO4</b> - Identify/confirm the identification of organic compound.
<b>BS203</b>	<b>BIOCHEMISTRY</b>	<b>CO1</b> -Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of

		<p>enzymes.</p> <p><b>CO2</b> - Understand the metabolism of nutrient molecules in physiological and pathological conditions.</p> <p><b>CO3</b> -Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.</p>
<b>BS204</b>	<b>PATHOPHYSIOLOGY</b>	<p><b>CO1</b> -Describe the etiology and pathogenesis of the selected disease states.</p> <p><b>CO2</b> - Name the signs and symptoms of the diseases.</p> <p><b>CO3</b> -Mention the complications of the diseases.</p>
<b>CS205</b>	<b>COMPUTER APPLICATIONS IN PHARMACY</b>	<p><b>CO1</b> - Know the various types of application of computers in pharmacy.</p> <p><b>CO2</b> - Know the various types of databases.</p> <p><b>CO3</b> - Know the various applications of databases in pharmacy.</p>

**B.Pharmacy 2<sup>nd</sup> year-1<sup>st</sup> Semester:** University Regulation – R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
PS301	<b>PHARMACEUTICAL ORGANIC CHEMISTRY-II</b>	<b>CO1</b> -Write the structure, name and the type of isomerism of the organic compound. <b>CO2</b> - Write the reaction, name the reaction and orientation of reactions. <b>CO3</b> - Account for reactivity/stability of compounds. <b>CO4</b> - Prepare organic compounds.
PS302	<b>PHYSICAL PHARMACEUTICS-I</b>	<b>CO1</b> -Understand various physicochemical properties of drug molecules in the designing the dosage form. <b>CO2</b> - Know the principles of chemical kinetics & to use them in assigning expiry date for formulation. <b>CO3</b> - Demonstrate use of physicochemical properties in evaluation of dosage forms. <b>CO4</b> - Appreciate physicochemical properties of drug molecules in formulation research and development.
BS303	<b>PHARMACEUTICAL MICROBIOLOGY</b>	<b>CO1</b> - Understand methods of identification, cultivation and preservation of various microorganisms. <b>CO2</b> -Importance of sterilization in microbiology and pharmaceutical industry. <b>CO3</b> -Learn sterility testing of pharmaceutical products. <b>CO4</b> - Microbiological standardization of Pharmaceuticals.

		<b>CO5</b> - Understand the cell culture technology and its applications in pharmaceutical industries.
<b>PC304</b>	<b>PHARMACEUTICAL ENGINEERING</b>	<b>CO1</b> - To know various unit operations used in Pharmaceutical industries. <b>CO2</b> -To understand the material handling techniques. <b>CO3</b> - To perform various processes involved in pharmaceutical manufacturing process. <b>CO4</b> - To carry out various tests to prevent environmental pollution. <b>CO5</b> -To appreciate and comprehend significance of plant lay out design for optimum use of resources. <b>CO6</b> -To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.

**B.Pharmacy 2<sup>nd</sup> year-2<sup>nd</sup> Semester:** University Regulation – R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PS401</b>	<b>PHARMACEUTICAL ORGANIC CHEMISTRY-III</b>	<b>CO1</b> -understand the methods of preparation and properties of organic compounds. <b>CO2</b> - explain the stereo chemical aspects of organic compounds and stereo chemical reactions. <b>CO3</b> -know the medicinal uses and other applications of organic compounds.
<b>PC402</b>	<b>MEDICINAL CHEMISTRY-I</b>	<b>CO1</b> -Understand the chemistry of drugs with respect to their pharmacological activity. <b>CO2</b> -Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.

		<p><b>CO3</b> -Know the Structural Activity Relationship (SAR) of different class of drugs.</p> <p><b>CO4</b> -Write the chemical synthesis of some drugs.</p>
<b>PS403</b>	<b>PHYSICAL PHARMACEUTICS-II</b>	<p><b>CO1</b> - Understand various physicochemical properties of drug molecules in the designing the dosage form.</p> <p><b>CO2</b> - Know the principles of chemical kinetics &amp; to use them in assigning expiry date for Formulation.</p> <p><b>CO3</b> -Demonstrate use of physicochemical properties in evaluation of dosage forms.</p> <p><b>CO4</b> -Appreciate physicochemical properties of drug molecules in formulation research and Development.</p>
<b>PC404</b>	<b>PHARMACOLOGY-I</b>	<p><b>CO1</b> -Understand the pharmacological actions of different categories of drugs.</p> <p><b>CO2</b> -Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels. <b>CO3</b> -Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.</p> <p><b>CO4</b>- Observe the effect of drugs on animals by simulated experiments.</p> <p><b>CO5</b> - Appreciate correlation of pharmacology with other bio medical sciences.</p>
<b>PC405</b>	<b>PHARMACOGNOSY AND PHYTOCHEMISTRY-I</b>	<p><b>CO1</b> -to know the techniques in the cultivation and production of crude drugs.</p> <p><b>CO2</b> - to know the crude drugs, their uses and chemical nature. <b>CO3</b> -know the evaluation techniques for the herbal drugs. <b>CO4</b> - to carry out the microscopic and</p>

		morphological evaluation of crude drugs.
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**B.Pharmacy 3<sup>rd</sup> year-1<sup>st</sup> Semester:** University Regulation – R16.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PS501</b>	<b>PHARMACEUTICAL MICROBIOLOGY</b>	<b>CO1</b> -know the anatomy, identification & cultivation of microorganisms. <b>CO2</b> -Perform sterilization of various pharmaceutical products, equipment, culture media etc. <b>CO-3</b> - Perform sterility testing of pharmaceutical products. <b>CO-4</b> Perform microbiological assay of antibiotics, Vitamins and amino acids. <b>CO-5</b> Do microbiological analysis of air, water and milk.
<b>PS502</b>	<b>PHARMACEUTICAL TECHNOLOGY – I</b>	<b>CO-1</b> -Student will know the preformulation parameters in designing the dosage form, ICH guidelines, preparation and evaluation of semisolids, ophthalmic and cosmetics.
<b>PS503</b>	<b>PHARMACOLOGY – I</b>	<b>CO-1-1</b> Understand the pharmacological aspects of drugs, importance of pharmacology subject as a basis of therapeutics and correlate the knowledge therapeutically.
<b>PS504</b>	<b>PHARMACOGNOSY – II</b>	<b>CO1</b> -After the study of the course, the student shall be able to know about the phytopharmaceuticals of commercial significance and the various applications of the crude drugs in the preparation of formulations as medicaments and excipients

		(Flavors, perfumes, sweeteners and colorants).
<b>PS505</b>	<b>DRUG REGULATORY AFFAIRS (Open Elective – II)</b>	<b>CO1</b> -The clear information about the regulations in India and abroad is gained by the students.
<b>PS506</b>	<b>ACTIVE PHARMACEUTICAL INGREDIENT PROCESS DEVELOPMENT (Open Elective – II)</b>	<b>CO1</b> -Students would understand the various aspects regarding process development and synthesis from pilot preparation to bulk drug.
<b>MS507</b>	<b>ENTREPRENEURSHIP AND SMALL BUSINESS ENTERPRISES (Open Elective – II)</b>	<b>CO1</b> -It enables students to learn the basics of Entrepreneurship and entrepreneurial development which will help them to provide vision for their own Start-up.
<b>MC500</b>	<b>PROFESSIONAL ETHICS</b>	<b>CO1</b> -The students will understand the importance of Values and Ethics in their personal lives and professional careers. The students will learn the rights and responsibilities as an employee, team member and a global citizen.

**B.Pharmacy 3<sup>rd</sup> year-2<sup>nd</sup> Semester:** University Regulation – R16.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PS601</b>	<b>MEDICINAL CHEMISTRY – I</b>	<b>CO1</b> -The students gain good knowledge about the usage of medicinal substances, the synthesis and drug-drug interactions, so that they can get involved with confidence in the patient counseling.

<b>PS602</b>	<b>PHARMACEUTICAL TECHNOLOGY – II</b>	<b>CO1</b> -The students shall be exposed to various aspects of pharmaceutical product preparations and evaluations of tablets, capsules etc.
<b>PS603</b>	<b>PHARMACOLOGY – II</b>	<b>CO1</b> -Understands the pharmacological aspects of drugs, importance of pharmacology subject as a basis of therapeutics and correlate the knowledge therapeutically.
<b>PS604</b>	<b>CHEMISTRY OF NATURAL PRODUCTS</b>	<b>CO1</b> -The knowledge of the students is enhanced with the clear information about the natural products which are having medicinal importance.
<b>PS605</b>	<b>GENERIC DRUG PRODUCT DEVELOPMENT (Open Elective – III)</b>	<b>CO1</b> -The knowledge of the students is enhanced with the clear information about the generic product development.
<b>PS606</b>	<b>DRUG DESIGN AND DISCOVERY (Open Elective – III)</b>	<b>CO1</b> -The students would be in a position to identify lead for new drug design, to design and discover the novel drugs with the knowledge they gained through the study of the various topics of the syllabus.
<b>PS607</b>	<b>SCREENING METHODS IN PHARMACOLOGY (Open Elective – III)</b>	<b>CO1</b> -The expected outcomes are student will know how to handle animals and know about various techniques for screening drugs for different pharmacological activities and guidelines and regulations for screening new drug molecules on animals and human volunteers.

**M.Pharmacy 1<sup>st</sup> Year 1<sup>st</sup> Semester (Pharmaceutical Analysis):**

University Regulation – R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>6412AA</b>	<b>ADVANCED PHARMACEUTICAL ANALYSIS (Core course–I)</b>	<b>CO1-</b> The quantitative determination of various organic compounds is clearly understood. The spectral analysis, dissolution parameters and microbial assays are also learned.
<b>6412AB</b>	<b>FOOD ANALYSIS (Core course–II)</b>	<b>CO1-</b> At completion of this course student shall be able to understand various analytical techniques in the determination of food constituents, food additives, finished food products, Pesticides in food And also student shall have the knowledge on food regulations and legislations.
<b>6412AC</b>	<b>MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (Core course - III)</b>	<b>CO1-</b> Appreciable knowledge will be gained by the students in the Modern Analytical Techniques and can apply the theories in the Analysis of various bulk drugs and their formulations. The students will also be in a position to apply their knowledge in developing the new methods for the determination and validate the procedures.
<b>6412AE</b>	<b>INTELLECTUAL PROPERTY RIGHTS (Core Elective – I)</b>	<b>CO1-</b> The clear information about the patent laws, intellectual property rights and drug regulation in India and abroad is gained by the

		students.
<b>6412AD</b>	<b>PHARMACEUTICAL VALIDATION (Core Elective – I)</b>	Upon completion of the subject student shall be able to <b>CO1-</b> Explain the aspect of validation. <b>CO2-</b> Carryout validation of manufacturing processes. <b>CO3-</b> Apply the knowledge of validation to instruments and equipments. <b>CO4-</b> Validate the manufacturing facilities.
<b>6412AF</b>	<b>DRUG REGULATORY AFFAIRS  (Open Elective - I)</b>	<b>CO1-</b> Students will come to know the different competent regulatory authorities globally. <b>CO2-</b> Students be aware of technical aspects pertaining to the marketing authorization application (MAA). <b>CO3-</b> The regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals.
<b>6412AG</b>	<b>PHARMACOEPIDEMIOLOGY &amp; PHARMACOECONOMICS (Open Elective - I)</b>	<b>CO1-</b> Understand the various epidemiological methods and their applications. <b>CO2-</b> Understand the fundamental principles of Pharmacoeconomics. <b>CO3-</b> Identify and determine relevant cost and consequences associated with pharmacy products and services. <b>CO4-</b> Perform the key Pharmacoeconomics analysis methods. <b>CO5-</b> Understand the Pharmacoeconomic decision

		<p>analysis methods and its applications.</p> <p><b>CO6-</b> Describe current Pharmacoeconomic methods and issues.</p> <p><b>CO7-</b> Understand the applications of Pharmacoeconomics to various pharmacy settings.</p>
<b>6412AH</b>	<b>PHARMACEUTICAL MANAGEMENT (Open Elective - I)</b>	<p><b>CO1-</b>These topics are useful for the students to know how to manage a pharma industry and its various departments viz. QA, QC, RA, Production etc.</p> <p><b>CO2-</b>Along with this it aids the students to develop leadership qualities, communication &amp; interpersonal skills, decisions making, motivation, organization &amp; various managerial functions &amp; professional skills required for a dynamic professional.</p> <p><b>CO3-</b>Management helps to understand the concept of managerial control, its levels &amp; role, importance in pharma industry.</p>
<b>6412AJ</b>	<b>HERBAL COSMETICS TECHNOLOGY (Open Elective - I)</b>	<p><b>CO1-</b>Students will learn about the raw materials used in herbal cosmetics and get exposed to various preparations herbal cosmetics.</p>
<b>6412AK</b>	<b>PHARMACEUTICAL FORMULATION TECHNOLOGY (Open Elective - I)</b>	<p><b>CO1-</b>Students shall explain the preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility.</p> <p><b>CO2-</b>Students also explain</p>

		<p>about formulation and development, use of excipients in tablets, powders, capsules, micro-encapsules and coating techniques.</p> <p><b>CO3-</b>They also learn and apply the statistical design in different formulations.</p>
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**M.Pharmacy 1<sup>st</sup> Year 2<sup>nd</sup> semester (Pharmaceutical Analysis):**

University Regulation-R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>6412AM</b>	<b>ADVANCED INSTRUMENTAL ANALYSIS (Professional course IV)</b>	<b>CO1-</b> By the completion of topics the students will come out with the thorough knowledge of various spectral aspects of X-Ray, IR, SEM, ORD etc which help them in further projects works and also industrial opportunities.
<b>6412AN</b>	<b>QUALITY CONTROL AND QUALITY ASSURANCE (Professional course V)</b>	<b>CO1-</b> The study of this subject builds the confidence in the minds on the students to develop and formulate high quality pharmaceutical products.
<b>6412AP</b>	<b>MODERN BIO-ANALYTICAL TECHNIQUES (Core course VI)</b>	<p>Upon completion of the course, the student shall be able to understand</p> <p><b>CO1-</b>Extraction of drugs from biological samples.</p> <p><b>CO2-</b> Separation of drugs from biological samples using different techniques.</p> <p><b>CO4-</b> Guidelines for BA/BE studies.</p>
<b>6412AQ</b>	<b>BIOSTATISTICS AND RESEARCH METHODOLOGY (Core Elective – III)</b>	<b>CO1-</b> The student will be known the Biostatistics arrangement, presentation and formation of tables and charts. They also know the

		correlation and regression & application of different methods, analysis of data and also learn how to write dissertation, thesis and Research paper.
<b>6412AR</b>	<b>SPECTRAL ANALYSIS (Professional Elective - IV)</b>	<b>CO1-</b> By the completion of topics the students will come out with the thorough knowledge of various spectral aspects of X-Ray, IR, SEM, ORD etc which help them in further projects works and also industrial opportunities.
<b>6412AT</b>	<b>SCREENING METHODS IN PHARMACOLOGY (Open Elective - II)</b>	<b>CO1-</b> The expected outcomes are students will know how to handle animals and know about various techniques for screening of drugs for different pharmacological activities, guidelines, and regulations for screening new drug molecules on animals.
<b>6412AU</b>	<b>STABILITY OF DRUGS AND DOSAGE FORMS (Open Elective - II)</b>	<b>CO1-</b> The students should describe the evaluation of stability of solutions, solids, and formulations against adverse conditions. <b>CO2-</b> The students should be able to suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.
<b>6412AV</b>	<b>ENTREPRENEURSHIP MANAGEMENT (Open Elective - II)</b>	<b>CO1-</b> The Role of enterprise in national and global economy. And dynamics of motivation and concepts of entrepreneurship. <b>CO2-</b> Demands and challenges of Growth Strategies And Networking.
<b>6412AW</b>	<b>NANO BASED DRUG</b>	<b>CO1-</b> The students should be

	<b>DELIVERY SYSTEMS (Open Elective - II)</b>	able to select the right kind of materials, able to develop nano- formulations with appropriate technologies, evaluate the product related test and for identified diseases.
<b>6412AX</b>	<b>HERBAL AND COSMETICS ANALYSIS (Open Elective - II)</b>	<b>CO1-</b> Determination of herbal remedies and regulations Analysis of natural products and monographs. <b>CO2-</b> Determination of Herbal drug-drug interaction. <b>CO3-</b> Principles of performance evaluation of cosmetic products.

**M.Pharmacy 2<sup>nd</sup> Year (Pharmaceutical Analysis):** University Regulation-R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>Pharmaceutical Analysis Project</b>	Project work	<b>CO1-</b> Acquirement of practical knowledge and skills for performing projects of Pharmaceutical Analysis area of pharmacy.

**M.Pharmacy 1<sup>st</sup> Year 1<sup>st</sup> Semester (Pharmaceutics):** University Regulation-R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>6403AA</b>	<b>ADVANCED PHYSICAL PHARMACEUTICS (Core course - I)</b>	<b>CO1-</b> The students will learn particle size analysis method, solid dispersion, physics of tablets, polymer classification and its applications. <b>CO2-</b> student will also practice the stability calculations, shelf life calculations and accelerated stability studies.

		<p><b>CO3-</b>They also understand the rheology, absorption related to liquids and semi-solid dosage forms with advances.</p> <p><b>CO4-</b>They also know the factors affecting the dissolution and solubility in related to In-vitro/In-vivo correlations.</p>
<b>6403AB</b>	<p><b>MODERN PHARMACEUTICS – I</b> (Core course - II)</p>	<p><b>CO1-</b>Students shall explain the preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility.</p> <p><b>CO2-</b> Students also explain about formulation and development, use of excipients in tablets, powders, capsules, micro-encapsules and coating techniques.</p> <p><b>CO3-</b> They also learn and apply the statistical design in different formulations.</p>
<b>6403AC</b>	<p><b>APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS</b> (Core course - III)</p>	<p><b>CO1-</b>students will be able to express factors affecting the bioavailability and stability of dosage form.</p> <p><b>CO2-</b> They also learn the bioequivalence studies and protocols for bioequivalent studies.</p> <p><b>CO3-</b> They also evaluate the parameters for the disposition, absorption and Michaelis-Menton constants for nonlinear kinetics.</p>
<b>6403AD</b>	<p><b>MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES</b> (Core Elective - I)</p>	<p><b>CO1-</b>The appreciable knowledge will be gained by the students in the Modern Analytical Techniques and can apply the theories in the</p>

		<p>Analysis of various bulk drugs and their formulations.</p> <p><b>CO2-</b>The students will also be in a position to apply their knowledge in developing the new methods for the determination and validate the procedures.</p>
<b>6403AE</b>	<p><b>INTELLECTUAL PROPERTY RIGHTS</b> (Core Elective - I)</p>	<p><b>CO1-</b>The clear information about the patent laws, intellectual property rights and drug regulation in India and abroad is gained by the students.</p>
<b>6403AF</b>	<p><b>PHARMACOEPIDEMIOLOGY &amp; PHARMACOECONOMICS</b> (Open Elective – I)</p>	<p><b>CO1-</b>Understand the various epidemiological methods and their applications and understand the fundamental principles of Pharmacoeconomics.</p> <p><b>CO2-</b> Identify and determine relevant cost and consequences associated with pharmacy products and services and perform the key Pharmacoeconomics analysis methods.</p> <p><b>CO3-</b> Understand the Pharmacoeconomic decision analysis methods and its applications.</p> <p><b>CO4-</b> Describe current Pharmacoeconomic methods and issues.</p> <p><b>CO5-</b> Understand the applications of Pharmacoeconomics to various pharmacy settings.</p>
<b>6403AG</b>	<p><b>DRUG REGULATORY AFFAIRS</b> (Open Elective – I)</p>	<p><b>CO1-</b> Students will come to know the different competent regulatory authorities globally. and be aware of technical aspects pertaining to the</p>

		<p>marketing authorization application.</p> <p><b>CO2-</b> The regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals.</p>
<b>6403AH</b>	<b>HERBAL COSMETICS TECHNOLOGY</b> <b>(Open Elective – I)</b>	<b>CO1-</b> Students will learn about the raw materials used in herbal cosmetics and get exposed to various preparations herbal cosmetics.
<b>6403AJ</b>	<b>PHARMACEUTICAL VALIDATION</b> <b>(Open Elective – I)</b>	<p><b>CO1-</b> Explain the aspect of validation and Carryout validation of manufacturing processes.</p> <p><b>CO2-</b> Apply the knowledge of validation to instruments and equipments and validate the manufacturing facilities.</p>
<b>6403AK</b>	<b>PHARMACEUTICAL MANAGEMENT</b> <b>(Open Elective – I)</b>	<p><b>CO1-</b>These topics are useful for the students to know how to manage a pharma industry and its various departments viz. QA, QC, RA, Production etc.</p> <p><b>CO2-</b> Along with this it aids the students to develop leadership qualities, communication &amp; interpersonal skills, decisions making, motivation, organization &amp; various managerial functions &amp; professional skills required for a dynamic professional.</p> <p><b>CO3-</b> Management helps to understand the concept of managerial control, its levels &amp; role, importance in pharma industry.</p>

**M.Pharmacy 1<sup>st</sup> Year 2<sup>nd</sup> Semester (Pharmaceutics):** University Regulation- R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>6403AM</b>	<b>ADVANCED DRUG DELIVERY SYSTEMS (Core course - IV)</b>	<b>CO1-</b> Students will know the fabrication, design, evaluation and application of above drug delivery systems.
<b>6403AN</b>	<b>INDUSTRIAL PHARMACY (Core course - V)</b>	<b>CO1-</b> The students will explain the machinery involved in milling, mixing, filtration, drying and packing material and constructions used in the production of pharmaceutical materials. <b>CO2-</b> They also learn salient features of GMP, TQM applicable in industry. <b>CO3-</b> They also understand the effluent treatments and prevent the pollution. <b>CO4-</b> They also should evaluate the validation of analytical methods and processes.
<b>6403AP</b>	<b>MODERN PHARMACEUTICS – II (Core course - VI)</b>	<b>CO1-</b> Students will understand the planning of pilot plant techniques used for all pharmaceutical dosage forms such as tablets, capsules, parenterals, aerosols, cosmetics and neutraceuticals.
<b>6403AQ</b>	<b>BIostatISTICS AND RESEARCH METHODOLOGY (Core Elective - II)</b>	<b>CO1-</b> The student will be known the Biostatistics arrangement, presentation and formation of tables and charts. <b>CO2-</b> They also know the

		correlation and regression & application of different methods of analysis of data and also learn how to write dissertation, thesis and Research paper.
<b>6403AR</b>	<b>STABILITY OF DRUGS AND DOSAGE FORMS (Core Elective - II)</b>	<b>CO1-</b> The students should describe the evaluation of stability of solutions, solids, and formulations against adverse conditions. <b>CO2-</b> The students should be able to suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.
<b>6403AT</b>	<b>SCREENING METHODS IN PHARMACOLOGY (Open Elective - II)</b>	<b>CO1-</b> The students will know how to handle animals and know about various techniques for screening of drugs for different pharmacological activities, guidelines and regulations for screening new drug molecules on animals.
<b>6403AU</b>	<b>NANO BASED DRUG DELIVERY SYSTEMS (Open Elective - II)</b>	<b>CO1-</b> The students should be able to select the right kind of materials, able to develop nano- formulations with appropriate technologies, evaluate the product related test and for identified diseases.
<b>6403AV</b>	<b>NUTRACEUTICALS (Open Elective - II)</b>	<b>CO1-</b> Helps the student to understand the importance of nutraceuticals in various common problems with the concept of free radicals.
<b>6403AW</b>	<b>ENTREPRENEURSHIP MANAGEMENT (Open Elective - II)</b>	<b>CO1-</b> The Role of enterprise in national and global economy. <b>CO2-</b> Dynamics of motivation and concepts of entrepreneurship. <b>CO3-</b> Demands and challenges of Growth

		Strategies And Networking.
<b>6403AX</b>	<b>CLINICAL RESEARCH AND PHARMACOVIGILANCE (Open Elective - II)</b>	<b>CO1-</b> Explain the regulatory requirements for conducting clinical trial. <b>CO2-</b> Demonstrate the types of clinical trial designs. <b>CO3-</b> Explain the responsibilities of key players involved in clinical trials. <b>CO4-</b> Execute safety monitoring, reporting and close-out activities. <b>CO5-</b> Explain the principles of Pharmacovigilance. <b>CO6-</b> Detect new adverse drug reactions and their assessment. <b>CO7-</b> Perform the adverse drug reaction reporting systems and communication in Pharmacovigilance.

**M.Pharmacy 2<sup>nd</sup> Year (Pharmaceutics):** University Regulation-R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>Pharmaceutics Project</b>	<b>Project work</b>	<b>CO1-</b> Aquirement of practical knowledge and skills for performing projects of concerned specialized areas of pharmacy.

**M.Pharmacy 1<sup>st</sup> Year 1<sup>st</sup> Semester (Pharmacology):** University Regulation-R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>6401AA</b>	<b>ADVANCED PHARMACOLOGY – I (Core Course I)</b>	Upon completion of the course the student shall be able to <b>CO1-</b> Discuss the pathophysiology and pharmacotherapy of certain diseases. <b>CO2-</b> Explain the

		<p>mechanism of drug actions at cellular and molecular level.  <b>CO3</b>-Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.</p>
<p><b>6401AB</b></p>	<p><b>CLINICAL PHARMACOLOGY &amp; PHARMACOTHERAPEUTICS (Core Course II)</b></p>	<p>At completion of this subject it is expected that students will be able to understand –  <b>CO1</b>-The pathophysiology of selected disease states and the rationale for drug therapy.  <b>CO2</b>- The controversies in drug therapy.  <b>CO3</b>- The importance of preparation of individualized therapeutic plans based on diagnosis.  <b>CO4</b>- needs to identify the patient-specific parameters relevant in initiating drug therapy and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).  <b>CO5</b>-summarize the therapeutic approach to management of the diseases including reference to the latest available evidence.  <b>CO6</b>-Therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).  <b>CO9</b>-Pathophysiology and applied Pharmacotherapeutics of diseases associated with following system/diseases</p>

		with of special reference to the drug of choice.
<b>6401AC</b>	<b>PHARMACOKINETICS AND DRUG METABOLISM (Core Course III)</b>	Upon completion of the subject student shall be able to (Know, do, appreciate) – <b>CO1</b> -Understand various pharmacokinetic parameters and the influence of these parameters on efficacy of drugs. <b>CO3</b> - Identify and resolve drug related problems. <b>CO4</b> - pharmacogenetics.
<b>6401AD</b>	<b>MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES (Core Elective - I)</b>	<b>CO1</b> - The appreciable knowledge will be gained by the students in the Modern Analytical Techniques and can apply the theories in the Analysis of various bulk drugs and their formulations. <b>CO2</b> -The students will also be in a position to apply their knowledge in developing the new methods for the determination and validation of the procedures.
<b>6401AE</b>	<b>CLINICAL RESEARCH AND PHARMACOVIGILANCE (Core Elective - I)</b>	<b>CO1</b> -Explain the regulatory requirements for conducting clinical trial. <b>CO2</b> -Demonstrate the types of clinical trial designs. <b>CO3</b> - Explain the responsibilities of key players involved in clinical trials. <b>CO4</b> - Execute safety monitoring, reporting and close-out activities. <b>CO5</b> - Explain the principles of Pharmacovigilance. <b>CO6</b> - Detect new adverse drug reactions and their assessment. <b>CO7</b> - Perform the adverse

		drug reaction reporting systems and communication in Pharmacovigilance.
<b>6401AF</b>	<b>PHARMACOEPIDEMIOLOGY &amp; PHARMACOECONOMICS (Open Elective - I)</b>	<p><b>CO1-</b> Understand the various epidemiological methods and their applications.</p> <p><b>CO2-</b> Understand the fundamental principles of Pharmacoeconomics.</p> <p><b>CO3-</b> Identify and determine relevant cost and consequences associated with pharmacy products and services.</p> <p><b>CO4-</b> Perform the key Pharmacoeconomics analysis methods.</p> <p><b>CO5-</b> Understand the Pharmacoeconomic decision analysis methods and its applications.</p> <p><b>CO6-</b> Describe current Pharmacoeconomic methods and issues.</p> <p><b>CO7-</b> Understand the applications of Pharmacoeconomics to various pharmacy settings.</p>
<b>6401AG</b>	<b>DRUG REGULATORY AFFAIRS (Open Elective - I)</b>	<p><b>CO1-</b> Students will come to know the different competent regulatory authorities globally. <b>CO2-</b> Students be aware of technical aspects pertaining to the marketing authorization application.</p> <p><b>CO3-</b> The regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals.</p>
<b>6401AH</b>	<b>HERBAL COSMETICS TECHNOLOGY</b>	<b>CO1-</b> Students will learn about the raw materials used

	<b>(Open Elective - I)</b>	in herbal cosmetics and get exposed to various preparations herbal cosmetics.
<b>6401AJ</b>	<b>PHARMACEUTICAL MANAGEMENT (Open Elective - I)</b>	<p><b>CO1-</b> These topics are useful for the students to know how to manage a pharma industry and its various departments viz. QA, QC, RA, Production etc.</p> <p><b>CO2-</b> Along with this it aids the students to develop leadership qualities, communication &amp; interpersonal skills, decisions making, motivation, organization &amp; various managerial functions &amp; professional skills required for a dynamic professional.</p> <p><b>CO3-</b> Management helps to understand the concept of managerial control, its levels &amp; role, importance in pharma industry.</p>
<b>6401AK</b>	<b>PHARMACEUTICAL FORMULATION TECHNOLOGY (Open Elective - I)</b>	<p><b>CO1-</b> Students shall explain the preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility.</p> <p><b>CO2-</b> Students also explain about formulation and development, use of excipients in tablets, powders, capsules, micro-capsules and coating techniques.</p> <p><b>CO3-</b> They also learn and apply the statistical design in different formulations.</p>

**M.Pharmacy 1<sup>st</sup> Year 2<sup>nd</sup> Semester (Pharmacology):** University Regulation-  
R17.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course out comes</b>
<b>6401AM</b>	<b>ADVANCED PHARMACOLOGY – II (Core Course - IV)</b>	<p><b>CO1-</b> Explain the mechanism of drug actions at cellular and molecular level.</p> <p><b>CO2-</b> Discuss the Pathophysiology and pharmacotherapy of certain diseases.</p> <p><b>CO3-</b> Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.</p>
<b>6401AN</b>	<b>PHARMACOLOGICAL AND TOXICOLOGICAL SCREENING METHODS (Core Course - V)</b>	<p><b>CO1-</b> Appraise the regulations and ethical requirement for the usage of experimental animals.</p> <p><b>CO2-</b> Describe the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals.</p> <p><b>CO3-</b> Describe the various newer screening methods involved in the drug discovery process.</p> <p><b>CO4-</b> Appreciate and correlate the preclinical data to humans.</p>
<b>6401AP</b>	<b>PRINCIPLES OF DRUG DISCOVERY (Core Course - VI)</b>	<p><b>CO1-</b> Explain the various stages of drug discovery.</p> <p><b>CO2-</b> Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery.</p> <p><b>CO3-</b> Explain various targets for drug discovery.</p> <p><b>CO4-</b> Explain various lead seeking method and lead</p>

		<p>optimization.</p> <p><b>CO5-</b> Appreciate the importance of the role of computer aided drug design in drug discovery.</p>
<b>6401AQ</b>	<p><b>QUALITY USE OF MEDICINES</b> (Core Elective - II)</p>	<p><b>CO1-</b> Understand the principles of quality use of medicines.</p> <p><b>CO2-</b> Know the benefits and risks associated with use of medicines.</p> <p><b>CO3-</b> Understand regulatory aspects of quality use of medicines.</p> <p><b>CO4-</b> Identify and resolve medication related problems.</p> <p><b>CO5-</b> Promote quality use of medicines.</p> <p><b>CO4-</b> Practice evidence-based medicines.</p>
<b>6401AR</b>	<p><b>PRINCIPLES OF TOXICOLOGY</b> (Core Elective - II)</p>	<p><b>CO1-</b> Explain the various types of toxicity studies.</p> <p><b>CO2-</b> Appreciate the importance of ethical and regulatory requirements for toxicity studies.</p> <p><b>CO3-</b> Demonstrate the practical skills required to conduct the preclinical toxicity studies.</p>
<b>6401AT</b>	<p><b>STABILITY OF DRUGS AND DOSAGE FORMS</b> (Open Elective II)</p>	<p><b>CO1-</b> The students should describe the evaluation of stability of solutions, solids, and formulations against adverse conditions.</p> <p><b>CO2-</b> The students should be able to suggest the measures to retain the stability and storage conditions for retaining the efficacy of the products.</p>
<b>6401AU</b>	<b>BIOSTATISTICS AND</b>	<b>CO1-</b> The student will be

	<b>RESEARCH METHODOLOGY (Open Elective II)</b>	known the Biostatistics arrangement, presentation and formation of tables and charts. <b>CO2-</b> They also know the correlation and regression & application of different methods, analysis of data and also learn how to write dissertation, thesis and Research paper.
<b>6401AV</b>	<b>ENTREPRENEURSHIP MANAGEMENT (Open Elective II)</b>	<b>CO1-</b> The Role of enterprise in national and global economy. <b>CO2-</b> Dynamics of motivation and concepts of entrepreneurship. <b>CO3-</b> Demands and challenges of Growth Strategies And Networking.
<b>6401AW</b>	<b>CLINICAL TOXICOLOGY (Open Elective II)</b>	<b>CO1-</b> At the end of the course the student is equipped with handling the first aid, elimination enhancement and treatment of poisoning and supportive care in poisoning due to Pesticides, Drug over usage, heavy metals, Radiation, Snakes and anthropod bites and food poisoning. <b>CO2-</b> The student also gains knowledge in substance abuse and treatment of drug dependence.
<b>6401AX</b>	<b>ADVANCED DRUG DELIVERY SYSTEMS (Open Elective II)</b>	<b>CO1-</b> Students will know the fabrication, design, evaluation and application of above drug delivery systems.

**M.Pharmacy 2<sup>nd</sup> Year (Pharmacology):** University Regulation-R17

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course out comes</b>
<b>Pharmacology Project</b>	Project work	<b>CO1-</b> Acquirement of practical knowledge and skills for performing projects of Pharmacology area of pharmacy.

**Pharm.D 1<sup>st</sup> year:** University regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PH101</b>	<b>HUMAN ANATOMY &amp; PHYSIOLOGY</b>	<b>CO1-</b> Describe the structure (gross and histology) and functions of various organs of the human body; <b>CO2-</b> Describe the various homeostatic mechanisms and their imbalances of various systems; <b>CO3-</b> Identify the various tissues and organs of the different systems of the human body; <b>CO4-</b> Perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes; <b>CO5-</b> Appreciate coordinated working pattern of different organs of each system <b>CO6-</b> Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body
<b>PH102</b>	<b>PHARMACEUTICS</b>	<b>CO1-</b> Know the formulation aspects of different dosage forms; <b>CO2-</b> Do different pharmaceutical calculation involved in formulation;

		<p><b>CO3-</b> Formulate different types of dosage forms; and</p> <p><b>CO4-</b> Appreciate the importance of good formulation for effectiveness.</p>
<b>PH103</b>	<b>MEDICINAL BIOCHEMISTRY</b>	<p><b>CO1-</b> Understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases;</p> <p><b>CO2-</b> Know the metabolic process of biomolecules in health and illness (metabolic disorders);</p> <p><b>CO3-</b> Understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism;</p> <p><b>CO4-</b> Know the biochemical principles of organ function tests of kidney, liver and endocrine gland; and</p> <p><b>CO5-</b> Do the qualitative analysis and determination of biomolecules in the body fluids.</p>
<b>PH104</b>	<b>PHARMACEUTICAL ORGANIC CHEMISTRY</b>	<p><b>CO1-</b> IUPAC/Common system of nomenclature of simple organic compounds belonging to different classes of organic compounds.</p> <p><b>CO2-</b> Some important physical properties of organic compounds.</p> <p><b>CO3-</b> Free radical/ nucleophilic [alkyl/ acyl/ aryl] /electrophilic substitution, free radical/ nucleophilic / electrophilic addition, elimination, oxidation and reduction reactions with mechanism, orientation of the reaction, order of reactivity</p>

		and stability of compounds. <b>CO4</b> -Some named organic reactions with mechanisms and methods of preparation, test for purity, principle involved in the assay, important medicinal uses of some important organic compounds.
<b>PH105</b>	<b>PHARMACEUTICAL INORGANIC CHEMISTRY</b>	<b>CO1</b> -Understand the principles and procedures of analysis of drugs and also regarding the application of inorganic pharmaceuticals. <b>CO2</b> - Know the analysis of the inorganic pharmaceuticals and their applications. <b>CO3</b> -Appreciate the importance of inorganic pharmaceuticals in preventing and curing the disease.
<b>PH106</b>	<b>REMEDIAL MATHEMATICS</b>	<b>CO1</b> -Know Trigonometry, Analytical geometry, Matrices, Determinant, Integration, Differential equation, Laplace transform and their applications. <b>CO2</b> - Solve the problems of different types by applying theory. <b>CO3</b> - Appreciate the important applications of mathematics in pharmacy.
<b>PH107</b>	<b>REMEDIAL BIOLOGY</b>	<b>CO1</b> -to make the student aware of various naturally occurring drugs and its history, sources, classification, distribution and the characters of the plants and animals.

**Pharm.D 2<sup>nd</sup> year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PH201</b>	<b>PATHOPHYSIOLOGY</b>	<b>CO1</b> -Describe the etiology and pathogenesis of the selected disease states. <b>CO2</b> - Name the signs and symptoms of the diseases. <b>CO3</b> - Mention the complications of the diseases.
<b>PH202</b>	<b>PHARMACEUTICAL MICROBIOLOGY</b>	<b>CO1</b> -Know the anatomy, identification, growth factors and sterilization of microorganisms. <b>CO2</b> -Know the mode of transmission of disease causing microorganism, symptoms of disease and treatment aspect. <b>CO3</b> -Do estimation of RNA and DNA and there by identifying the source and do cultivation and identification of the microorganisms in the laboratory. <b>CO4</b> -Do identification of diseases by performing the diagnostic tests and appreciate the behavior of motility and behavioral characteristics of microorganisms.
<b>PH203</b>	<b>PHARMACOGNOSY &amp; PHYTOPHARMACEUTICALS</b>	<b>CO1</b> -Understand the basic principles of cultivation, collection and storage of crude drugs. <b>CO2</b> - Know the source, active constituents and uses of crude drugs. <b>CO3</b> - Appreciate the applications of primary and secondary metabolites of the plant.

<p><b>PH204</b></p>	<p><b>PHARMACOLOGY – I</b></p>	<p><b>CO1</b>-Understand the pharmacological aspects of drugs falling under the mentioned chapters.  <b>CO2</b>-Handle and carry out the animal experiments.  <b>CO3</b>- Appreciate the importance of pharmacology subject as a basis of therapeutics.  <b>CO4</b>-Correlate and apply the knowledge therapeutically.</p>
<p><b>PH205</b></p>	<p><b>COMMUNITY PHARMACY</b></p>	<p><b>CO1</b>-Know pharmaceutical care services.  <b>CO2</b>- Know the business and professional practice management skills in community pharmacies.  <b>CO3</b>-Do patient counseling &amp; provide health screening services to public in community pharmacy.  <b>CO4</b>- Respond to minor ailments and provide appropriate medication.  <b>CO5</b>- Show empathy and sympathy to patients and appreciate the concept of Rational drug therapy.</p>
<p><b>PH206</b></p>	<p><b>PHARMACOTHERAPEUTICS - I</b></p>	<p><b>CO1</b>-The pathophysiology of selected disease states and the rationale for drug therapy.  <b>CO2</b>-The therapeutic approach to management of these diseases.  <b>CO3</b>-The controversies in drug therapy and the importance of preparation of individualized therapeutic plans based on diagnosis.  <b>CO4</b>- Needs to identify the</p>

		<p>patient-specific parameters relevant in initiating drug therapy and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p> <p><b>CO5</b> -Describe the pathophysiology of selected disease states and explain the rationale for drug therapy.</p> <p><b>CO6</b>-Summarise the therapeutic approach to management of these diseases including reference to the latest available evidence.</p> <p><b>CO7</b>-Discuss the controversies in drug therapy.</p> <p><b>CO8</b>-Discuss the preparation of individualized therapeutic plans based on diagnosis.</p> <p><b>CO9</b>-Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p>
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**Pharm.D 3<sup>rd</sup> Year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
PH301	PHARMACOLOGY – II	<p><b>CO1</b>-Understand the pharmacological aspects of drugs falling under the mentioned chapters.</p> <p><b>CO2</b>- Carry out the animal experiments confidently.</p>

		<p><b>CO3-</b> Appreciate the importance of pharmacology subject as a basis of therapeutics.</p> <p><b>CO4-</b> Correlate and apply the knowledge therapeutically.</p>
<b>PH302</b>	<b>PHARMACEUTICAL ANALYSIS</b>	<p><b>CO1-</b>The appreciable knowledge will be gained by the students in the Pharmaceutical Analysis and can apply the theories in the Analysis of various bulk drugs and their formulations.</p> <p><b>CO2-</b>The students will also be in a position to apply their knowledge in developing the new methods for the determination and validate the procedures.</p>
<b>PH303</b>	<b>PHARMACOTHERAPEUTICS – II</b>	<p><b>CO1-</b> Know the pathophysiology of selected disease states and the rationale for drug therapy.</p> <p><b>CO2-</b>Know the therapeutic approach to management of these diseases.</p> <p><b>CO3-</b> Know the controversies in drug therapy.</p> <p><b>CO4-</b> Know the importance of preparation of individualized therapeutic plans based on diagnosis.</p> <p><b>CO5-</b> Appreciate the needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p>
<b>PH304</b>	<b>PHARMACEUTICAL</b>	<b>CO1-</b> Practice the

	<b>JURISPRUDENCE</b>	<p>Professional ethics.</p> <p><b>CO2</b>-Understand the various concepts of the pharmaceutical legislation in India.</p> <p><b>CO3</b>-Know the various parameters in the Drug and Cosmetic Act and rules.</p> <p><b>CO4</b>- Know the Drug policy, DPCO, Patent and design act.</p> <p><b>CO5</b>-Understand the labeling requirements and packaging guidelines for drugs and cosmetics.</p> <p><b>CO6</b>-Be able to understand the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act.</p> <p><b>CO7</b>- Other laws as prescribed by the Pharmacy Council of India from time to time including International Laws.</p>
<b>PH305</b>	<b>MEDICINAL CHEMISTRY</b>	<p><b>CO 1</b>-understand the chemistry of drugs with respect to their pharmacological activity.</p> <p><b>CO2</b>-Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs.</p> <p><b>CO3</b>-Know the Structural Activity Relationship (SAR) of different class of drugs.</p> <p><b>CO4</b>-Write the chemical synthesis of some drugs.</p>
<b>PH306</b>	<b>PHARMACEUTICAL FORMULATIONS</b>	<p><b>CO1</b>-Understand the principle involved in formulation of various pharmaceutical dosage forms.</p> <p><b>CO2</b>- Prepare various pharmaceutical formulation.</p> <p><b>CO3</b>- Perform evaluation of pharmaceutical dosage</p>

		forms. <b>CO4-</b> Understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.
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**Pharm.D 4<sup>th</sup> year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PD401</b>	<b>PHARMACOTHERAPEUTICS – III</b>	<p><b>CO1-</b>The pathophysiology of selected disease states and the rationale for drug therapy.</p> <p><b>CO2-</b> The therapeutic approach to management of these diseases.</p> <p><b>CO3-</b> The controversies in drug therapy.</p> <p><b>CO4-</b> The importance of preparation of individualized therapeutic plans based on diagnosis and needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p> <p><b>CO5-</b> Describe the pathophysiology of selected disease states and explain the rationale for drug therapy and to summarize the therapeutic approach to management of these diseases including reference to the latest available evidence.</p> <p><b>CO6-</b> To discuss the controversies in drug therapy.</p>

		<p><b>CO7-</b> To discuss the preparation of individualized therapeutic plans based on diagnosis.</p> <p><b>CO8-</b> Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p>
<b>PD402</b>	<b>HOSPITAL PHARMACY</b>	<p><b>CO1-</b> Know various drug distribution methods.</p> <p><b>CO2-</b> Know the professional practice management skills in hospital pharmacies.</p> <p><b>CO3-</b> Provide unbiased drug information to the doctors and know the manufacturing practices of various formulations in hospital set up. <b>CO4-</b> Appreciate the practice based research methods.</p> <p><b>CO5-</b> Appreciate the stores management and inventory control.</p>
<b>PD403</b>	<b>CLINICAL PHARMACY</b>	<p><b>CO1-</b> Monitor drug therapy of patient through medication chart review and clinical review.</p> <p><b>CO2-</b> Obtain medication history interview and counsel the patients.</p> <p><b>CO3-</b> Identify and resolve drug related problems.</p> <p><b>CO4-</b> Detect, assess and monitor adverse drug reaction. <b>CO5-</b> Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.</p> <p><b>CO6-</b> Retrieve, analyse,</p>

		interpret and formulate drug or medicine information.
<b>PD404</b>	<b>BIostatISTICS AND RESEARCH METHODOLOGY</b>	<p><b>CO1</b>-The student will be knowing the Biostatistics arrangement, presentation and formation of tables and charts.</p> <p><b>CO2</b>-They also know the correlation and regression &amp; application of different methods, analysis of data and also learn how to write dissertation, thesis and Research paper.</p>
<b>PD405</b>	<b>BIOPHARMACEUTICS AND PHARMACOKINETICS</b>	<p><b>CO1</b>-students will be able to express factors affecting the bioavailability and stability of dosage form.</p> <p><b>CO2</b>-They also learn the bioequivalence studies and protocols for bioequivalent studies.</p> <p><b>CO3</b>-They also evaluate the parameters for the disposition, absorption and Michaelis-Menton constants for nonlinear kinetics.</p>
<b>PD406</b>	<b>CLINICAL TOXICOLOGY</b>	<p><b>CO1</b>- The student will be equipped with handling the first aid, elimination enhancement and treatment of poisoning and supportive care in poisoning due to Pesticides, drug over usage, Heavy metals, Radiation, Snakes and anthropod bites and Food poisoning.</p> <p><b>CO2</b>- The student also gains knowledge in substance abuse and treatment of drug dependence.</p>

**Pharm.D 5<sup>th</sup> Year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PD501</b>	<b>CLINICAL RESEARCH</b>	<b>CO1-</b> Explain the regulatory requirements for conducting clinical trial. <b>CO2-</b> Demonstrate the types of clinical trial designs. <b>CO3-</b> Explain the responsibilities of key players involved in clinical trials. <b>CO4-</b> Execute safety monitoring, reporting and close-out activities. <b>CO5-</b> Explain the principles of Pharmacovigilance. <b>CO6-</b> Detect new adverse drug reactions and their assessment.
<b>PD502</b>	<b>PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS</b>	<b>CO1-</b> Acquire the knowledge about the scope and applications of the Pharmacoepidemiology. <b>CO2-</b> Acquire the knowledge about the measurement of outcomes, assessment of the risk and conduct of Pharmacoepidemiological studies.
<b>PD503</b>	<b>CLINICAL PHARMACOKINETICS AND PHARMACOTHERAPEUTIC DRUG MONITORING</b>	<b>CO1-</b> Appreciate the importance of the clinical pharmacokinetics and therapeutic drug monitoring. <b>CO2-</b> Acquire the knowledge about the design of dosage regimens, pharmacokinetics of drug interactions, therapeutic drug monitoring, dosage adjustment in the renal and hepatic diseases, population pharmacokinetics and pharmacogenetics.
<b>PD505</b>	<b>PROJECT WORK</b>	<b>CO1-</b> To Acquire the knowledge and skills required for performing a project in

		the hospital and clinical settings.
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**Pharm.D 6<sup>th</sup> Year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PD601</b>	<b>Internship</b>	<b>CO1-</b> Acquirement of practical knowledge and skills for performing various roles of pharmacist in the hospitals and in the clinical research area.

**Pharm.D (PB) 1<sup>st</sup> Year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PH401</b>	<b>PHARMACOTHERAPEUTICS – III</b>	<p><b>CO1-</b>The pathophysiology of selected disease states and the rationale for drug therapy.</p> <p><b>CO2-</b> The therapeutic approach to management of these diseases.</p> <p><b>CO3-</b> The controversies in drug therapy.</p> <p><b>CO4-</b> The importance of preparation of individualized therapeutic plans based on diagnosis and needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p> <p><b>CO5-</b> Describe the pathophysiology of selected disease states and explain the rationale for drug therapy and to summarize the therapeutic approach to management of these</p>

		<p>diseases including reference to the latest available evidence.</p> <p><b>CO6-</b> To discuss the controversies in drug therapy.</p> <p><b>CO7-</b> To discuss the preparation of individualized therapeutic plans based on diagnosis.</p> <p><b>CO8-</b> Identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p>
<b>PH402</b>	<b>HOSPITAL PHARMACY</b>	<p><b>CO1-</b> Know various drug distribution methods.</p> <p><b>CO2-</b> Know the professional practice management skills in hospital pharmacies.</p> <p><b>CO3-</b> Provide unbiased drug information to the doctors and know the manufacturing practices of various formulations in hospital set up.</p> <p><b>CO4-</b> Appreciate the practice based research methods.</p> <p><b>CO5-</b> Appreciate the stores management and inventory control.</p>
<b>PH403</b>	<b>CLINICAL PHARMACY</b>	<p><b>CO1-</b> Monitor drug therapy of patient through medication chart review and clinical review.</p> <p><b>CO2-</b> Obtain medication history interview and counsel the patients.</p> <p><b>CO3-</b> Identify and resolve drug related problems.</p> <p><b>CO4-</b> Detect, assess and</p>

		<p>monitor adverse drug reaction. <b>CO5</b>-Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.</p> <p><b>CO6</b>- Retrieve, analyse, interpret and formulate drug or medicine information.</p>
<b>PH404</b>	<b>BIostatistics AND RESEARCH METHODOLOGY</b>	<p><b>CO1</b>-The student will be knowing the Biostatistics arrangement, presentation and formation of tables and charts.</p> <p><b>CO2</b>-They also know the correlation and regression &amp; application of different methods, analysis of data and also learn how to write dissertation, thesis and Research paper.</p>
<b>PH405</b>	<b>BIOPHARMACEUTICS AND PHARMACOKINETICS</b>	<p><b>CO1</b>-students will be able to express factors affecting the bioavailability and stability of dosage form.</p> <p><b>CO2</b>-They also learn the bioequivalence studies and protocols for bioequivalent studies.</p> <p><b>CO3</b>-They also evaluate the parameters for the disposition, absorption and Michaelis-Menton constants for nonlinear kinetics.</p>
<b>PH406</b>	<b>CLINICAL TOXICOLOGY</b>	<p><b>CO1</b>- The student will be equipped with handling the first aid, elimination enhancement and treatment of poisoning and supportive care in poisoning due to Pesticides, Drug over usage, Heavy metals, Radiation, Snakes and anthropod bites and Food poisoning.</p>

		<b>CO2-</b> The student also gains knowledge in substance abuse and treatment of drug dependence.
<b>PH411</b>	<b>PHARMACOTHERAPEUTICS – I &amp; II</b>	<p><b>CO1-</b> Know the pathophysiology of selected disease states and the rationale for drug therapy.</p> <p><b>CO2-</b> Know the therapeutic approach to management of these diseases.</p> <p><b>CO3-</b> Know the controversies in drug therapy.</p> <p><b>CO4-</b> Know the importance of preparation of individualized therapeutic plans based on diagnosis.</p> <p><b>CO5-</b> Appreciate the needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).</p>

**Pharm.D(PB) 2<sup>nd</sup> year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PH501</b>	<b>CLINICAL RESEARCH</b>	<p><b>CO1-</b> Explain the regulatory requirements for conducting clinical trial.</p> <p><b>CO2-</b> Demonstrate the types of clinical trial designs.</p> <p><b>CO3-</b> Explain the responsibilities of key players involved in clinical trials.</p> <p><b>CO4-</b> Execute safety monitoring, reporting and close-out activities.</p> <p><b>CO5-</b> Explain the principles</p>

		of Pharmacovigilance. <b>CO6-</b> Detect new adverse drug reactions and their assessment.
<b>PH502</b>	<b>PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS</b>	<b>CO1-</b> Acquire the knowledge about the scope and applications of the Pharmacoepidemiology. <b>CO2-</b> Acquire the knowledge about the measurement of outcomes, assessment of the risk and conduct of Pharmacoepidemiological studies.
<b>PH503</b>	<b>CLINICAL PHARMACOKINETICS AND PHARMACOTHERAPEUTIC DRUG MONITORING</b>	<b>CO1-</b> Appreciate the importance of the clinical pharmacokinetics and therapeutic drug monitoring. <b>CO2-</b> Acquire the knowledge about the design of dosage regimens, pharmacokinetics of drug interactions, therapeutic drug monitoring and dosage adjustment in the renal and hepatic diseases, population pharmacokinetics and pharmacogenetics.
<b>PH505</b>	<b>PROJECT WORK</b>	<b>CO1-</b> To Acquire the knowledge and skills required for performing a project in the hospital and clinical settings.

**Pharm.D(PB) 3<sup>rd</sup> year:** University Regulation-R08.

<b>Subject code</b>	<b>Name of the subject</b>	<b>Course outcomes</b>
<b>PH601</b>	<b>Internship</b>	<b>CO1-</b> Acquirement of practical knowledge and skills for performing various roles of pharmacist in the hospitals and in the clinical research area.

