2.6.1: Program and Course Outcomes for All Programmes Offered by the Institution

The Course Outcomes (COs) represent the described level of knowledge and skills the students can acquire at the end of the course. COs have been thoughtfully defined for all courses across the various programs being offered. The Course Outcomes of all courses offered are prepared by the respective course instructor at the start of the semester and uploaded on the college website. The course instructor maintains a teaching plan in which around five to six-course outcomes are written based on the requirements. They should be measurable and mapped across relevant cognitive levels of Bloom's taxonomy. The introductory lectures planned for all courses are meant for communicating the COs to the students by the course instructor. POs from graduate attributes mapped with COs are verified by Program Assessment Committee members.

The PAC minutes are discussed and get approval from the Department Advisory Board Committee. The Program Outcomes (POs), which are based on Graduate Attributes, are circulated amongst all graduates and stakeholders and are prominently displayed on department notice boards, laboratories, classrooms, college brochures, and also the institute website. The National Board of Accreditation has defined 12 POs derived from the graduate attributes, thus maintaining slight modifications required for the respective departments across all branches of Undergraduate Programs in Engineering. Workshops, seminars, and FDPs have been conducted to educate teachers about outcome-based education and its implementation. Program Specific Outcomes (PSOs) and Program Educational Objectives (PEOs) have been defined and stated after much debate and involvement of the stakeholders. This has been done for all undergraduate programs offered in the institute. It is also displayed on the institute website along with the Poss. In our institution, every faculty member understands the concept of outcome-based education and conscientiously tries to ensure that outcome attainments are met.

PROGRAMME OUTCOME – B PHARM

- **PO1 – Pharmacy Knowledge**: Possess and apply the knowledge of chemical synthesis and evaluation, pharmaceutical technologies and pharmacology, formulation, and development of pharmaceuticals.
- **PO2 – Problem Analysis and Development of Solutions**: Develop an ability to identify and analyse problems and interpret data generated from formulation development, quality control, and quality assurance to find solutions.
- **PO3 – Conduct Investigations of Complex Problems**: Use research-based knowledge and research methods, including the design of experiments, analysis, and elucidation of data and synthesis, to provide valid conclusions.
- **PO4 – Modern Tool Usage**: Create, select, and apply appropriate techniques, resources, and modern IT tools to complex activities in the field of pharmacology and chemistry, with an understanding of their limitations.
- **PO5 – Competency**: Pharmacy graduates with employable skills and high technical competence for the pharmaceutical industry and healthcare sector.
- **PO6 – Environment and Sustainability**: Understand the impact of pharmacy professional solutions in societal and environmental contexts and strive for eco-friendly pharmaceutical operations/services to maintain public health.
- **PO7 – Pharmaceutical Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of pharmacy practice. Apply ethical principles while making decisions and take responsibility for the outcomes associated with those decisions.
- **PO8 – Individual and Team Work**: Function effectively as an individual and as an active member or leader in a healthcare team and in a multidisciplinary setting.
- **PO9 – Communication**: Communicate effectively in both verbal and written form.
- **PO10 – Project Management and Finance**: Demonstrate knowledge and understanding of basic pharmaceutical sciences and management principles and apply these to one's own work as a member and leader in a team to manage projects.
- **PO11 – Entrepreneurship**: Develop entrepreneurship skills that support the growth of the pharmaceutical industry/pharmaceutical services leading to economic development.
- **PO12 – Lifelong Learning**: Recognize the need for, and have the preparation and ability to engage in, independent and lifelong learning, and develop an aptitude for continuous professional development.

PROGRAMME SPECIFIC OUTCOME OF B PHARM

- **PSO1**: To produce a pharmacist workforce competent for society.
- **PSO2**: To produce pharmacy graduates with employable skills and high technical competence in the pharmaceutical industry and healthcare sector.
- **PSO3**: To inculcate research activity and develop a passion for discovery and innovations.
- **PSO4**: To develop entrepreneurship qualities that support the growth of pharmaceutical intellectual property and contribute to economic development throughout the world.

PROGRAMME OUTCOME – PHARM D

- **PO1 – Pharmacy Knowledge**: Possess and apply knowledge of pharmacy practice and the ability to acquire, manage, and use current information for problem-solving, patient-specific, population-specific, evidence-based care to promote safe and optimal pharmacotherapy outcomes.
- **PO2 – Problem Analysis and Development of Solutions**: Identify and analyse complex health problems, reaching substantial conclusions using biomedical knowledge. Design solutions for complex health problems and design system components or processes that meet the specified need.
- **PO3 – Conduct Investigations of Complex Problems**: Apply critical thinking skills together with investigation, analysis, creativity, and evaluation of information, data, and documents related to drugs, poisons, clinical investigations, pharmaceutical care, and practices.
- **PO4 – Modern Tool Usage**: Create, select, and apply appropriate techniques, resources, and modern IT tools with an understanding of their limitations and also provide relevant information regarding health.
- **PO5 – The Pharmacist and Society**: Apply knowledge to help society adopt a healthy lifestyle and to promote the rational use of drugs in the practice setting, especially in hospitals, clinical, and community settings.
- **PO6 – Patient/Pharmaceutical Care**: Provide high-quality evidence-based patient-centred care in cooperation with patients, prescribers, and members of the interprofessional healthcare team.
- **PO7 – Pharmaceutical Ethics**: Demonstrate exemplary professional, ethical, and legal behaviour complying with all laws and regulations related to pharmacy practice and demonstrate respect for patients' privacy and autonomy.
- **PO8 – Individual and Team Work**: Function effectively as an individual and as an active member or leader in a healthcare team and in a multidisciplinary setting.
- **PO9 – Communication**: Communicate effectively to the public as well as to healthcare professionals for the well-being of the patient and be able to provide patient counseling and make effective presentations to professionals for their queries.
- **PO10 – Project Management and Finance**: Demonstrate knowledge and understanding of basic pharmaceutical sciences and management principles and apply these to medication

therapy management and work on an interprofessional team to enhance quality and safety.

- **PO11 – Entrepreneurship**: Develop entrepreneurship skills that support the growth of the pharmaceutical industry/pharmaceutical services leading to economic development.
- **PO12 – Lifelong Learning**: Recognize the need for, and have the preparation and ability to engage in, independent and lifelong learning, and develop an aptitude for continuous professional development.

PROGRAMME SPECIFIC OUTCOME OF PHARM D

- **PSO1**: Provide pharmaceutical care in all practice areas, including inpatient, ambulatory, and community practice, and ensure the rational use of medicines.
- **PSO2**: Provide high-quality information regarding drugs and diseases to prescribers and members of the interprofessional healthcare team.
- **PSO3**: Demonstrate the ability to use critical analysis and problem-solving skills in areas like patient counseling and pharmacovigilance for the provision of improved patient care.
- **PSO4**: Locate, appraise, and assimilate evidence from scientific studies to enhance the quality of care and services by effectively utilizing information, informatics, and technology to optimize learning and patient care.

PROGRAMME OUTCOME – M PHARM

- **PO1 – Pharmacy Knowledge**: Have sound knowledge of principles and their applications in pharmaceutical sciences.
- **PO2 – Problem Analysis and Development of Solutions**: Develop the ability for critical thinking to identify, formulate, and solve issues related to the pharmaceutical industry, regulatory agencies, and hospital and community pharmacy.
- **PO3 – Innovations**: Demonstrate the ability to design and conduct experiments, analyse and interpret data towards the development of innovative products, processes, or pharmaceutical care.
- **PO4 – Modern Tool Usage**: Develop the ability to use lab equipment and different kinds of simulation software with in-depth knowledge to design synthetic and analytical processes to perform experiments on synthesis, pharmaceutical analysis, and formulation problems.
- **PO5 – The Pharmacist and Society**: Apply knowledge to help society adopt a healthy lifestyle and to promote the rational use of drugs in the practice setting, especially in hospital, clinical, and community settings.
- **PO6 – Environment and Sustainability**: Understand the impact of professional pharmacy solutions in societal and environmental contexts for the correct procurement, storage, and disposal of medicines. Demonstrate eco-friendly products and processes to maintain public health.
- **PO7 – Pharmaceutical Ethics**: Apply ethical principles and commit to professional ethics and

responsibilities and norms of pharmacy practice. Apply ethical principles while making decisions and take responsibility for the outcomes associated with those decisions.

- **PO8 – Individual and Team Work**: Function effectively as an individual and as an active member or leader in a healthcare team and in a multidisciplinary setting.
- **PO9 – Communication**: Communicate effectively with the public as well as with professionals, demonstrating the ability to comprehend, write effective reports, make effective presentations, and provide clear documentation.
- **PO10 – Project Management and Finance**: Demonstrate knowledge and understanding of basic pharmaceutical sciences and management principles and apply these to one's own work, as a member and leader in a team to manage projects.
- **PO11 – Entrepreneurship**: Develop entrepreneurship skills that support the growth of the pharmaceutical industry/pharmaceutical services leading to economic development.
- **PO12 – Lifelong Learning**: learning and need for, and have the preparation and ability to engage in, independent and lifelong learning, and develop an aptitude for continuous professional development. Demonstrate knowledge of research and development in different disciplines of pharmaceutical sciences.

M PHARM PHARMACEUTICAL ANALYSIS

- **PSO1**: Can carry out highly sensitive analytical procedures using sophisticated instruments and interpret the data scientifically.
- **PSO2**: Capable of developing and validating newer analytical methods for various samples using advanced analytical techniques and tools as per regulatory needs.
- **PSO3**: Able to carry out quality control tests for pharmaceuticals, food products, herbal drugs, and cosmetics.
- **PSO4**: Able to demonstrate the ability to establish quality control protocols for herbal drugs.
- **PSO5**: Able to demonstrate knowledge of international pharmaceutical regulatory affairs.

M PHARM PHARMACEUTICS

- **PSO1**: Apply the principles of drug delivery systems in the development of eco-friendly, efficacious dosage forms.
- **PSO2**: Able to develop and evaluate new drug formulations meeting regulatory specifications.
- **PSO3**: Able to carry out pharmaceutical unit operations.
- **PSO4**: Able to carry out process validation as per regulatory requirements.
- **PSO5**: Able to use scientific software tools in the development, validation, and quality assurance of drug delivery systems.

Course Outcomes - B.Pharm

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1	B.Pharm 1st sem	Human anatomy and Physiology-I	1. Students would have studied about the gross morphology, structure and functions of cell,skeletal, muscular, cardiovascular system of the humanbody. 2. They would have understood the various homeostatic mechanisms and theirimbalances. 3. Students would able to identify the different types of bones in human body. 4. Students would be able to identify the various tissues of different systems of human body. 5. Students would learn about the various experimental techniques related to physiology. 6. They would have learnt various techniques like blood group determination, blood pressure measurement, blood cells counting
2		Pharmaceutical analysis I	1. Learning this subject content will develop the ideas with the fundamentalof analytical chemistry among the pupil. 2. It constructs the fundamental methodologyto prepare different strength of solutions. 3. It facilitate the fellow pupilto predict the sources of mistakes and errors. 4. It helps to develop the fundamentals of volumetric analytical skills. 5. It peculates the basic knowledge in the principles of electrochemical analytical techniques 6. The student interpretation skills will be improve by thecourse content in terms of choice of analytical

			techniques to perform the estimation of different category drugs.
3		Pharmaceutics I	1.Upon completion of this program the student will havefundamental knowledge in preparing conventional dosage forms
4		Pharmaceutical inorganic chemistry	1. Well acquainted with the principles of limit tests. 2. Familiar with different classesof inorganic pharmaceuticals and their analysis 3. Identification of different anions, cations and differentinorganic pharmaceuticals. 4. Knowledge about the sourcesof impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals 5. understand the medicinal and pharmaceutical importance of inorganic compounds 6. To have been introduced to a variety of inorganic drug classes.
5		Communication skills	Upon completion of the course the student shall be able to 1. Understand the behavioral needs for a Pharmacist to function effectively in the 2. areas of pharmaceutical operation 3. Communicate effectively (Verbal and Non Verbal) 4. Effectively manage the team as a team player 5. Develop interview skills 6. Develop Leadership qualities and essentials
6		Remedial biology	The main aim of this course is to

		Remedial mathematics	make aware the students to understand and learn about : 1. Cell biology (Basic Nature of Plant cell and Animal cell) 2. Classification System of both Plants & Animals 3. Various tissue system and organ system in plant and animals 4. Theory of evolution 5. Anatomy and Physiology of plants and animals 1. Apply mathematical concepts and principles to perform computations for PharmaceuticalSciences. 2. Create, use and analyze mathematical representations and mathematical relationships 3. Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy 4. Perform abstract mathematical reasoning

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1	B.Pharm 2nd sem	Human anatomy and physiology II	1. Students would have studied about the gross morphology, structure and functions of nervous, respiratory, urinary and reproductive systems in thehuman body. 2. They would have studied in detailed about energy and metabolism. 3. Students would able to identify the various organs of different systems of human body. 4. They would have performed and learnt about the experiments like neurologicalreflex, body temperature measurement 5. They would have studied elaborate on interlinkedmechanisms in the maintenance of normal functioning of human body 6. They would have learnt and performed the experiments like Olfaction, gustation reflex and eye sight
2		Pharmaceutical organic chemistry I	1. Write the structure, name of the organic compound 2. Knowledge about the type of isomerism 3. Write the reaction, name the reaction and orientation of reactions 4. Account for reactivity/stability of compounds, 5. Identify/confirm the unknown organic compound 6. Knowledge about the naming reactions of carbonylcompounds 7. To perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration, etc.
3		Biochemistry	1. To understand the importance of metabolism of

			substrates. 2. Will acquire chemistry and biological importance of biological macromolecules. 3. To acquire knowledge in qualitative and quantitative estimation of the biological macromolecules. 4. To know the interpretation ofdata emanating from a Clinical Test Lab. 5. To know how physiological conditions influence the structures and re-activities ofbiomolecules. 6. To understand the basic principles of protein and polysaccharide structure.
4		Pathophysiology	1. 1.Describe the etiology and pathogenesis of the selected disease states 2. 2.Knowledge of signs and symptoms of the diseases 3. Identify the complications ofthe diseases. 4. 4.Know most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements
5		Computer applications in pharmacy	On completion of this course, the students will be able to: 1. 1.Apply the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any givenrequirement 2. Design and develop solutions to analyze

			pharmaceutical problems using computers. 3. Integrate and apply efficiently the contemporary IT tools to all Pharmaceutical relatedactivities 4. 4. Solve and work with a professional context pertaining to ethics, social, cultural and regulations with regard toPharmacy .
6		Environmental sciences	1. This program shall create an awareness abo utenvironmental problems,develop an attitude towards of concern for the environment.

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1	B.Pharm 3rdsem	Pharmaceutical organic chemistry II	1. Basic knowledge regarding general methods of preparation of organic compounds. 2. Understand the reactions of some organic compounds. 3. To understand Reactivity of organic compounds. 4. Special emphasis on mechanisms and orientationof chemical reactions 1. 5.To acquire knowledge in heterocyclic compounds 2. 6. To acquire knowledge about the electrophilic and nucleophilic reactions.
2		Physical pharmaceutics I	Upon successful completion of the course, students will be able to: 1. State the physicochemical properties of drug molecules, pH, and solubility 2. Explain the role of surfactants, interfacial phenomenon and thermodynamics 3. Describe the flow behavior of fluids and concept ofcomplexation 4. Analyze the chemical stabilitytests of various drug products 5. Understand the physicalproperties of solutions, buffers, isotonicity, dispersesystems and rheology. 6. Understand of physicochemical properties of drugs including solubility, distribution, adsorption, and stability.

			7. Have basic knowledge of pharmaceutical suspensions and colloids. 8. 7.Have basic understandingof the pharmaceutical applications of variousphysical 9. Principles such as lyophilization, aerosols, condensed systems, and phase diagram.
4		Microbiology	1. Students will be able to acquire, articulate, retain andapply specialized language and knowledge relevant to microbiology. 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. 3. Students will communicate scientific concepts, experimental results and analytical arguments clearlyand concisely, both verballyand in writing. 4. Students will demonstrate isolation of and identificationof microbes. 5. Students can able to design microbiology laboratory considering all the aspects of safety 6.Students will acquire knowledge about validating themicrobiological equipment and reporting the observations
4		Pharmaceutical engineering	1. To know various unit operations used in Pharmaceutical industries.

			2. To understand the materialhandling techniques. 3. To perform various processesinvolved in pharmaceutical manufacturing process. 4. To carry out various test toprevent environmental pollution. 5. To appreciate and comprehend significance ofplant lay out design for optimum 6. Use of resources. 7. To appreciate the various preventive methods used forcorrosion control in 8. Pharmaceutical industries
5		Pharmaceutical jurisprudence	1. Know the Pharmaceutical legislations and their implications in the development and marketing 2. Know various Indian pharmaceutical Acts, Lawsand schedule 3. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals 4. Know code of ethics during the pharmaceutical practice

1	B.Pharm 4th sem	Pharmaceutical organic chemistry III	1. To acquire the knowledge and understanding of the basic experimental principles of heterocyclic chemistry. 2. To draw the structures and synthesize simple pharmaceuticallyactive organic compounds having five and six membered heterocycliccompounds. 3. To describe detailed mechanisms for common naming reactions. 4. To be able to run experimental techniques, procedures and safe laboratory practices. 5. Stereo-chemical features including conformation and stereo electronic effects; Geometrical isomers
2		Medicinal chemistry I	1. Helps in correlating between pharmacology of a disease and its mitigation or cure. 2. To understand the drug metabolic pathways, adverse effect and therapeutic value of drugs 3. To know the structural activity relationship of different class of drugs. 4. Well acquainted with the synthesis ofsome important class of drugs. 5. Knowledge about the mechanism pathways of different class of medicinal compounds.

			6. To understand the chemistry ofdrugs with respect to their pharmacological activity.
3		Physical pharmaceutics II	Upon successful completion of the course,students will be able to: 1. State the physicochemical propertiesof drug molecules, pH, and solubility 2. Explain the role of surfactants, interfacial phenomenon and thermodynamics 3. Describe the flow behavior of fluids and concept of complexation 4. Analyze the chemical stability tests of various drug products 5. Understand the physical properties of solutions, buffers, isotonicity, disperse systems and rheology. 6. Understand of physicochemical properties of drugs including solubility, distribution, adsorption,and stability. 7. Have basic knowledge of pharmaceutical suspensions and colloids. 8. Have basic understanding of the pharmaceutical applications of various physical 9. Principles such as lyophilization, aerosols, condensed systems, and phase diagram.
4		Pharmacology I	1. Students would have understood the pharmacological actions of different categories of drugs 2. They would have studied in detailed about mechanism of drug action at organ system/sub cellular/macromolecular levels. 3. They would have understood the application of basic pharmacological knowledge in the prevention and treatment of various diseases. 4. They would have observed the effect of drugs on animals by simulated experiments 5. They would got an idea aboutcorrelation of pharmacology with other bio medical sciences. 6. They would have understood the signal transduction mechanism of various receptors

5		Pharmacognosy I	This course is one of the most advanced introductions in Herbal Medicines that is offered. Will learn and get experience about: 1. Herbs, and their Science. 2. Classification of Medicinal Plants, Phytochemistry, Carbohydrates, Lipids, 3. Terpenes, Polyphenols, Alkaloids, Pharmacology, Toxicity, Formulations and Preparations ofHerbalMedicines. 4. How herbs influence our physiologyand can be helpful against several disorders. 5. Relationsbetween Phyto-therapy andthe Elderly, Phytotherapy and Children, Understanding Herbal Action, and Understanding the MateriaMedica. 6. The recognition of medicinal plants, identification of adulteration andContamination. 7. Ethnobotany&Ethnopharmacology indrug discovery process. 8. 8. DNA Finger printing.

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1	B.Pharm 5th sem	Medicinal chemistry II	1. Helps in correlating between pharmacology of a disease and its mitigation or cure. 2. To write the chemical synthesis ofsome drugs. 3. To know the structural activity relationship of different class of drugs. 4. Knowledge about the mechanism pathways of different class of medicinal compounds. 5. To acquire knowledge about the chemotherapy for cancer. 6. To understand the chemistry of drugswith respect to their pharmacologicalactivity.
2		Formulative pharmacy	1. After successful completion of the course student will be able to understand the various drug deliverysystem and its mechanisms. 2. Students will learn advanced drug delivery system early stage. 3. Developing a preparation of the drug which is both stable and acceptable tothe patient. 4. They know very well about orally administered drugs, injectables, aerosol and semisolid preparationswith standard protocols. 5. Formulated drugs are stored in a suitable container closure system forextended periods of time. 6. Also they know the stability study andits standard evaluation procedure for better storage conditions.
3		Pharmacology II	1. Students would have understood the mechanism of drug action and its

			relevance in the treatment of different diseases 2. They would be trained with isolation of different organs/tissues from the laboratory animals by simulated experiments 3. They would have observed the various receptor actions using isolated tissue preparation 4. Students would appreciate the correlation of pharmacology withrelated medical sciences 5. They would have understood the cell communication mechanism 6. They would appreciate the newer targets of several disease conditions for treatment.
4		Pharmacognosy II	This course is one of the most advanced introductions in Herbal Medicines that is offered. Will learn and get experience about 1. Herbs, and their Science. 2. Classification of Medicinal Plants, Phytochemistry, Carbohydrates, Lipids, 3. Terpenes, Polyphenols, Alkaloids, Pharmacology, Toxicity, Formulationsand Preparations of HerbalMedicines. 4. How herbs influence our physiologyand can be helpful against several disorders. 5. RelationsbetweenPhyto-therapy andthe Elderly, Phytotherapy and Children, Understanding Herbal Action, and Understanding the MateriaMedica. 6. The recognition of medicinal plants, identification of adulteration and Contamination. 7. Ethnobotany&Ethnopharmacology indrug discovery process. 8. DNA Finger printing.
5		Pharmaceutical biotechnology	1. 1 .Students will understand the various techniques used in modern biotechnology. 2. Students can design research strategy with step-by-step instructions to address a researchproblem 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 4. Students can explain the concept and application of monoclonal antibody technology 5. Students can demonstrate and Provide examples on how to use microbes and mammalian cells for theproduction of pharmaceutical products 6. Students can able to explain the general principles of generating transgenic plants, animals and microbes

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1	B.Pharm 6thsem	Medicinal chemistry III	1. To develop an understandingof the physico-chemical properties of drugs. 2. To understand how current drugs were developed by using pharmacophore modeling and docking technique. 3. To acquire knowledge in the chemotherapy for cancer and microbial diseases and different anti-viral agents. 4. To acquire knowledge aboutthe mechanism pathways ofdifferent class of medicinal compounds. 5. To have been introduced to a variety of drug classes andsome pharmacological properties. 6. To acquire knowledge on thrust areas fir further research.
2		Pharmacology III	1. Students would have studied elaborately on mechanism of drug action and its relevance in the treatment of different infectious diseases 2. They comprehended theprinciples of toxicology andtreatment of various poisonings and 3. They came across the methods of toxicity studies 4. They studied about symptoms of several poisonings 5. They studied about treatment of several poisonings 6. Students understood the toxicityprofile of each drugs
3		Herbal drug	1. The aim of the degree

		technology	course is to provide graduates with a goodknowledge of thebasic and applied know-how and professional skills in Herbal drugScienceand Technology and the necessary training for admission to the postgraduate courses in this field. 2. They will acquire operativeknow-how and be able to carry out technical and 3. management tasks and professional activities in the areas of transformation of 4. medicinal herbs,management of the quality of the processes, marketing of 5. medicinal plants and derivatives for use in herbal, food and cosmetic products, 6. Guaranteeing conformitywith the national and EU laws in force. 7. At the end of the course, the graduate will have acquired the following know-howandskills: • The recognition, collection and preservation of medicinal plants. • Analyses and dosage of active ingredients. • The biological effects of medicinal plants. • The toxicological aspects of active ingredients and finished products. • The study, design,management, control and conduction of the processing systems of medicinal plants and derivatives. • Management of quality of medicinal plant products and derivatives. • The possible application of medicinal plants and derivatives as health Products, including the food

			and cosmetics sectors. • Technical-scientific consulting in the specializedpress for the herbalsector,the promotion of information in the medicinal plants and derivatives sector.
4		Biopharmaceutics and pharmacokinetics	After successful completion of the course student will be able to: 1. Understand the concept of ADME of drug in human body. 2. Determine the various pharmacokinetic parametersfrom either plasma concentration or urinary excretion data for drug 3. Apply the various regulations related to developing BA-BE study protocol for the new drug molecule.
5		Pharmaceutical quality assurance	1. The students understand the importance of quality in pharmaceutical products. 2. The students is explored into importance of Good practices such asGMP,GLPect. 3. The factors affecting the quality of pharmaceutical is explored. 4. He understands the regulatory aspects of pharmaceutical taught to the student. 5. The process involved in manufacturing of pharmaceuticals different section/department andactivity is learnt. 6. The various documentation process is highlighted to the student.

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1	B.Pharm4th year	Medicinal chemistryII	1. Helps in correlating between pharmacology of a disease and its mitigation or cure. 2. To write the chemical synthesis of some drugs. 3. To know the structural activity relationship of different class of drugs. 4. Knowledge about the mechanism pathways of different class of medicinal compounds. 5. To acquire knowledge aboutthe chemotherapy for cancer. 6. To understand the chemistryof drugs with respect to their pharmacological activity.
2		Pharmacology II	1. Students understood the mechanism of drug actionand its relevance in the treatment of different diseases 2. They comprehended the principles of toxicology and treatment of various poisonings. 3. They are able to locate and isolate different organs/tissues from the laboratory animals used in pharmacological experiments 4. They studied in detailed about various receptor actions using isolated tissue preparation 5. They understood the correlation of pharmacology

			with related medical sciences 6. Students were studied about the various methodsof toxicity studies
3		Advanced Pharmacognosy	This course is one of the oldest specialisations in Herbal Medicines that is offered. Will learn and get experience about 1. Definition and objectives of Pharmacognosy. Information about the use of Medicinalplants. Plant as a source of drugs of pharmaceutical interest. 2. Extraction procedures for natural compounds, their differences and their applications the main pathways of aromatic amino acids, alkaloids,phenylpropanoids 3. Biogenesis and biological activity of natural products coming from mevalonate: terpenoids and steroids; 4. The biological activities of several compounds belonging to polyketides, terpenoids and steroids; and their traditional use and application in pharmaceutical and/or nutraceutical field. 5. Indian Traditional systems of Medicine. 6. Use of microscopic methods in the identification of natural drugs and herbal products, with emphasis on the use of light and scanningelectron microscopes. 7. Principles and concepts in plant taxonomy, which include identification, classification, nomenclature,discussion of major recent/modern systems, family characterization and field work methods. 8. Marine natural product chemistry. Include examples

			of marine antineoplastic agents, marine toxins, and other pharmaceutically relevant marine natural products from various marine organisms. 9. Introduction to Herbal cosmetics and Nutrients.
4		Formulative and Industrial pharmacy	1. know the various pharmaceutical dosage formsand their manufacturing techniques. 2. know various considerations indevelopment of pharmaceutical dosage forms 3. formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.
5		Instrumental method of analysis	The student will learn to 1. The basic theoreticalknowledge of the instrumentation techniques available. 2. Theoretically understand the aspects of separation for multi components. 3. Practical skills for the analysis of drugs and excipients using various instrumentation techniques. 4. To make accurate analysis and report the results in defined formats. 5. To learn documentation and express the observations with clarity. 6. To understand the professional and safety responsibilities for working in the analysis laboratory.
6		Pharmacy practice	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. 2. Students will use knowledgeof drug distribution methodsin hospital and apply it in the practice of pharmacy. 3. Students will effectively apply principles of drug store management and inventory control to medication use. 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 interviewand counsel the patients, identify drug related problems. 5. Students will engage in innovative activities by making use of the knowledge of clinical trials 6. Students will exhibit professional ethics by producing safe and appropriate medication usethroughout society

Course Outcomes - Pharm. D.

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1.1	Pharm.D. – First Year	Human Anatomy and Physiology	1. They would have learnt the gross anatomy, histology and physiology of various organs of the human body. 2. They would identify the various tissues and organs associated with the different organ systems with help of charts and specimens. 3. They would have studied the coordination in functioning of different organs of each system. 4. They would have understood the several physiological homeostaticmechanisms and their imbalances inhuman body. 5. They would have learnt the interlinked mechanisms in themaintenance in normal and physicalexercise conditions. 6. They would have learnt andperformed the hematological tests parameters, blood pressure recording, heart rate, pulse and respiratory volumes.
1.2		Pharmaceutics	1. Upon completion of this program the student will know the formulation aspects of different dosage forms do different pharmaceutical calculation involved in formulation and appreciate theimportance of good formulation for effectiveness.
1.3		Medicinal Biochemistry	1. To understand the importance of metabolism of substrates. 2. Will acquire chemistry and biological importance of biological macromolecules. 3. To acquire knowledge in qualitative and quantitative estimation of the

			biological macromolecules. 4. To know the interpretation of data emanating from a Clinical Test Lab. 5. To know how physiological conditions influence the structuresand reactivity's of biomolecules. 6. To understand the basic principlesof protein and polysaccharide structure.
1.4		Pharmaceutical Organic Chemistry	1. To be able to give systematic names to simple organic compounds and poly functionalgroup. 2. To achieve an understanding of the behavior of organic compounds and to establish a foundation for studies into natural and synthetic products of pharmaceuticalinterest. 3. To acquire the knowledge and understanding of the basic experimental principles of pharmaceutical organic chemistry. 4. To draw the structures and synthesize simple pharmaceutically active organic compounds. 5. To describe detailed mechanisms for common reactions. 6. To be able to run experimental techniques, procedures and safe laboratory practices.
1.5		Pharmaceutical Inorganic Chemistry	1. Well acquainted with the principlesof limit tests. 2. Understand the principles and procedures of analysis of drugs andalso regarding the application of inorganic pharmaceutical. 3. Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals 4. Appreciate the importance of inorganic pharmaceuticals in

			preventing and curing the disease. 5. To have been introduced to a variety of inorganic drug classes. 6. To know the analysis of the inorganic pharmaceuticals their applications.
1.6		Remedial Mathematics Remedial Biology	1. Apply mathematical concepts and principles to perform computationsfor Pharmaceutical Sciences. 2. Create, use and analyze mathematical representations andmathematical relationships 3. Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy 4. Perform abstract mathematical reasoning The main aim of this course is to make aware the students to understand and learn about 1. Cell biology (Basic Nature of Plantcell and Animal cell) 2. Classification System of both Plants& Animals 3. Various tissue system and organsystem in plant and animals 4. Theory of evolution 5. Anatomy and Physiology of plantsand animals
2.1		Pathophysiology	1. Students will define the basic pathogenesis of human disease 2. Students will define and explore themost common etiologies and predisposing factors associated withhuman disease 3. Students understands the basis forsome laboratory tests and other diagnostic procedures 4. Students will make correlations between pathophysiology and clinical skills they are learning in their allied health science programs. 5. Students will understand how the

	Pharm.D.-Second Year		various organ systems are interrelated, and use this understanding to promote a holisticapproach towards the evaluation and treatment of patients
2.2		Pharmaceutical Microbiology	1. Students can able to demonstrate an understanding at an advanced level of microbial virulence mechanisms and host response to infection; application of molecular techniques to medical microbiology;microbial susceptibility and resistance to antimicrobial agents; replication of viruses, viral immunology and pathogenesis, detection of viruses 2. Students can able to understandingof various infections (microbial causes, pathogenesis, transmissionof infection, diagnosis, prevention and treatment) by being able to identify a unknown organisms in clinical samples, and describe the pathogenesis of important pathogens 3. Students Demonstrate a basic understanding of the pathogenesis of some important fungal infectionsof humans, and be able to identify and isolate them from clinical samples 4. Students Work cooperatively as part of a small group and Criticallyassess and interpret scientific literature 5. Students can Analyze and report on complex research questions, and solve problems, plan a work program or diagnostic strategy andlearn independently 6. Students can able to demonstratesafe working practices in microbiology, adhere to microbiological requirements for safe work procedures

2.3		Pharmacognosy&Phytopharmaceuticals	This course is one of the most advanced introductions in Herbal Medicines that is offered. Will learn and get experience about 1. Herbs and their Science 2. Classification of Medicinal Plants, Phytochemistry, Carbohydrates, Lipids, 3. Terpenes, Polyphenols, Alkaloids, Pharmacology, Toxicity, Formulations and Preparations ofHerbal Medicines 4. How herbs influence our physiologyand can be helpful against several disorders. 5. Relationsbetween Phyto-therapy and the Elderly, Phytotherapy andChildren, Understanding Herbal Action, and Understanding the Materia Medica. 6. The recognition of medicinal plants, identification of adulteration andContamination. 7. Ethnobotany &Ethno pharmacologyin drug discovery process. 8. DNA Finger printing.
2.4		Pharmacology - I	1. The student would have learntabout the different drugs used with an emphasis on its classification, Pharmacodynamic and pharmacokinetic aspects, adverse effects, Therapeutic uses. 2. They would have studied, dose, route of administration, precautions, and contraindications. 3. They would have understood the pharmacological aspects of drugs used to treat ailment of differentorgan systems of the body. 4. They would appreciate the importance of drug discovery by preclinical and clinical trials. 5. They would appreciate the importance of pharmacology subject as a basis of therapeutics. 6. They would apply the knowledge of

			drugs and its detailed description therapeutically in clinical casescenario.
2.5		Community Pharmacy	1. Students will provide patient- centered care to diverse patients using the best available evidence and in consideration of patients' circumstances to devise, modify, implement, document and monitor pharmacotherapy care plans, either independently or as part of healthcare team 2. Students will demonstrate knowledge of the business and professional practice managementskills in community pharmacies. 3. Students will educate patients through counseling &provide healthscreening services to public 4. Students will identify symptoms ofminor ailments and provide appropriate medication 5. Students will participate in prevention programs of communicable diseases 6. Students will exhibit professional ethics by promoting safe and appropriate medication use throughout society
2.6		Pharmacotherapeutics– I	1. Students will be able to describe the pathophysiology and management of cardiovascular,respiratory and endocrine diseases 2. Students will be developing Patientcase based Assessment Skills 3. Students willbe able to describe thequality use of medicines issues surrounding the therapeutic agentsin the treatment of these diseases 4. Students will have developed clinical skills in the therapeutic management of these conditions 5. Continue to develop communicationskills. 6. Students will provide patient –

			centred care to diverse patients using the evidence based medicine
3.1	Pharm. D. – Third Year	Pharmacology -II	1. In continuation with the previousyear, this subject would have continued describing about the different drugs used for treatmentof diseases. 2. The students would have learnt about drugs used to cancer, inflammation, respiratory system, GIT, immune system and hormones. 3. They would have understood the principles of animal toxicology and bioassay procedures. 4. They would have learnt in depthknowledge on cell, macromolecules, cell signaling, DNA replication and cell cycle. 5. They would appreciate the importance of gene and its structure, genome, gene expression, recombinant DNA technology and other associated aspects. 6. They would have finally learnt toapply the knowledge of drugs practically using simulated pharmacological experiments.
3.2		Pharmaceutical Analysis	1. To understand the importance of analysis in pharmaceutical industry 2. To understand the knowledge aboutassay of pharmaceutical substance and product 3. To develop basic practical skills using instrumental techniques 4. To inculcate theoretical knowledgeon various instrumental techniquesadopted for analysis of pharmaceuticals 5. To develop various methodologies for assay of drugs and pharmaceuticals with the skills andknowledge gained 6. To understand and gain knowledge

			on trouble shooting in adopting various methodologies using instrumental techniques
3.3		Pharmacotherapeutics – II	1. Students will be able to describe the pathophysiology and management of cardiovascular,respiratory and endocrine diseases 2. Students will be developing Patientcase based Assessment Skills 3. Students willbe able to describe thequality use of medicines issues surrounding the therapeutic agentsin the treatment of these diseases 4. Students will have developed clinical skills in the therapeutic management of these conditions 5. Continue to develop communicationskills. 6. Students will provide patient – centred care to diverse patients using the evidence based medicine
3.4		Pharmaceutical Jurisprudence	Upon Completion of the subject studentlearnt: 1. About Professional ethics 2. They understood the various concepts of the Pharmaceutical Legislation in India. 3. They understood the various parameters in the Drug and Cosmetic Act and rules. 4. They understood the various concepts of Drug policy, DPCO, Patent and Designing act. 5. They came to know about the labelling requirements and packaging guidelines for Drugs andCosmetics. 6. They understood the concepts of Dangerous Drugs Act, Pharmacy Actand Excise duties Act. 7. They came to know about the salient features of different laws which have been prescribed by the Pharmacy Council of India from

			time to time including InternationalLaws.
3.5		Medicinal Chemistry	1. To understand the chemistry ofdrugs with respect to their biological activity. 2. To know the metabolism, adverseeffect and therapeutic activity of drugs. 3. To understand the different modern techniques of drug design. 4. To appreciate the SAR of some important drug classes. 5. To acquire knowledge in the chemotherapy for cancer and microbial diseases and differentanti-viral agents. 6. To have been introduced to a variety of drug classes and some pharmacological properties.
3.6		Pharmaceutical Formulations	1. Students will understand the principle involved in formulation of various pharmaceutical dosage forms, prepare various pharmaceutical formulation, perform evaluation ofpharmaceutical dosage forms, understand and appreciate the concept of bioavailability and bioequivalence, their role in clinical situations.
4.1		Pharmacotherapeutics -III	1. Initiate drug therapy and the anticipated therapeutic goals by therapeutic intervention 2. Know the effective use of non-pharmacological therapeutic interventions in the treatment of specific diseases, conditions and symptoms. 3. Demonstrate the ability to effectively communicate and work collaboratively together with others in the small group setting

	Pharm.D.-Fourth Year		4. Have moral reasoning, ethical judgement and professionalism
4.2		Hospital Pharmacy	1. Know Various Drug Distribution Methods; 2. Know The Professional Practice Management Skills In Hospital Pharmacies; 3. Provide Unbiased Drug InformationTo The Doctors; 4. Know The Manufacturing Practices Of Various Formulations In HospitalSet Up; 5. Appreciate The Practice Based Research Methods; And 6. Appreciate the stores managementand inventory control.
4.3		Clinical Pharmacy	1. Monitor drug therapy of patient through medication chart reviewand clinical review; 2. Obtain medication history interviewand counsel the patients; 3. Identify and resolve drug related problems; 4. Detect, assess and monitor adversedrug reaction; 5. Interpret selected laboratory results(as monitoring parameters in therapeutics) of specific disease states; and 6. Retrieve, analyze, interpret and formulate drug or medicine information.
4.4		Biostatistics & Research Methodology	1. Know the various statistical methods to solve different types ofproblems 2. Operate various statistical software packages 3. Appreciate the importance of Computer in hospital and Community Pharmacy 4. Appreciate the statistical technique in solving the pharmaceutical problems

4.5		Biopharmaceutics & Pharmacokinetics	1. Broader understanding about the concepts of biopharmaceutics and pharmacokinetics. 2. Ability to calculate the various pharmacokinetic parameters by usingvarious mathematical models. 3. Ability to design a basic protocol for theconduct of BA/BE study and the interpretation of the BA/BE data 4. Preparedness to use the concepts of pharmacokinetic principles in the clinicalcontexts. 5. Ability to design and perform *in-vitro* dissolution studies for various drugs as per the standards of official monographs 6. Basic understanding about the conceptsof *in-vitro - in-vivo* correlations (IVIVC)
4.6		Clinical Toxicology	1. Developing general working knowledge of the principles and practice of clinical toxicology 2. Demonstrating an understanding ofthe health implications of toxic exposures and commonly involved chemicals for toxicity 3. Demonstrating and applying an understanding of general toxicology principles and clinical management practice 4. Demonstrating and applying an understanding of the history, assessment, and therapy considerations associated with themanagement of a toxic exposure 5. Demonstrating and apply an understanding of the characteristicsof and treatment guidelines for specific toxic substances 6. Proposing several preventive approaches to reduce unintentionalpoisonings 7. Enabling the pharmacist to function as contributing health care team

			member when faced with a toxic exposure experience, including emergencies.
4.7		Pharmacotherapeutics I &II	1. The pathophysiology of selected disease states and the rationale fordrug therapy. 2. The therapeutic approach to management of these diseases. 3. The controversies in drug therapy. 4. The importance of preparation of individualized therapeutic plans based on diagnosis. 5. Needs to identify the patient- specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinicaland laboratory indices of therapeutic response and adverse effects). 6. Describe the pathophysiology of selected disease states and explainthe rationale for drug therapy. 7. Summarize the therapeutic approach to management of thesediseases including reference to thelatest available evidence. 8. Discuss the controversies in drug therapy. 9. Discuss the preparation of individualized therapeutic plans based on diagnosis. 10. Identify the patient-specific parameters relevant in initiatingdrug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeuticresponse and adverse effects).
5.1		Clinical Research	1. Know the new drug development process. 2. Understand the regulatory and ethical requirements. 3. Appreciate and conduct the clinical

	Pharm.D.-Fifth Year		trials activities 4. Know safety monitoring and reporting in clinical trials 5. Manage the trial coordination process 6. Know the new drug development process. 7. Understand the regulatory and ethical requirements. 8. Appreciate and conduct the clinicaltrials activities 9. Know safety monitoring and reporting in clinical trials 10. Manage the trial coordination process
5.2		Pharmacoepidemiology&Pharmacoeconomics	1. Describe the methods used in Pharmacoepidemiology 2. Demonstrate competency in the design, conduct and evaluation of Pharmacoepidemiology studies. 3. Describe the methods used in Pharmacoeconomic analysis. 4. Demonstrate competency in the design, conduct and evaluation of Pharmacoeconomic studies.
5.3		Clinical Pharmacokinetics & Pharmacotherapeutic Drug Monitoring	1. Ability to apply the concepts of Pharmacokinetics to individualizethe drug dosage regimen in clinical settings. 2. Ability to design a dosage regimen of a drug based on its route of administration 3. Ability to design and implement pharmacokinetic services such as • Intravenous to Oral conversion of dosage regimens • Therapeutic Drug Monitoring Services 4. Broader understanding about the significance of alteredpharmacokinetics, Pharmacogenetics and

			Pharmacometrics. 5. Ability to adjust the dosage regimen for patients with renal / hepatic impairments 6. Ability to assess the druginteraction issues in the clinical settings 7. Ability to design and implement therapeutic drug monitoring services for various drugs

Course Outcomes – M.Pharm

1. Pharmaceutics

Sl. No.	Name of the Program	Name of the Course	Course Outcome

1	M. Pharm.	Drug Delivery Systems	• Drug delivery system give a detailed information transporting a pharmaceutical compound in the body as needed to safely achieve its desiredtherapeutic effect. • Also it refers to approaches, formulations, technologies,and systems for transportinga pharmaceutical compound in the body as needed tosafely achieve itsdesired therapeutic effectwith suitable drug delivery. • Vaccine delivery and different mode of application approach for clinical use. • They know the different types of Drug carrier used in the process of drug delivery which serves to improve the selectivity, effectiveness, and/or safety of drug administration. • The students will know the latest drug delivery knowledge and think todevelop new formulation based on the individualRequirement. • Recent developments in protein and peptide for parenteral delivery approaches will givenewdimension of drug deliver for antibiotics, insulin, etc.
2		Modern Pharmaceutics	• Basics of medical devices and IVDs, process of development, ethical and

			quality considerations harmonization initiatives for approval and marketing of medical devices and IVDs regulatory approval process for medical devices and IVDsin India, US, Canada, EU, Japan and ASEAN clinical evaluation and investigation of medical devices and IVDs
3		Regulatory Affairs	• The Concepts of innovatorand generic drugs, drug development process • The Regulatory guidance's and guidelines for filing and approval process • Preparation of Dossiers andtheir submission to regulatory agencies in different countries • Post approval regulatory requirements for actives anddrug products • Submission of global documents in CTD/ eCTD formats • Clinical trials requirements for approvals for conductingclinical trials • Pharmacovigilence and process of monitoring i n clinical trials
4		Molecular Pharmaceutics (NanoTech and targetedDDS)	• The various approaches for development of novel drug delivery systems. • The criteria for selection of drugs and polymers for the development of NTDS • The formulation and evaluation of novel drug delivery systems.

5		Advanced Biopharmaceutics a ndpharmacokinetics	• The basic concepts in biopharmaceutics and pharmacokinetics. • The use raw data and derive the pharmacokinetic models

			and parameters the best describe the process of drugabsorption, distribution, metabolism and elimination. • The critical evaluation of biopharmaceutic studies involving drug product equivalency. • The design and evaluation of dosage regimens of the drugsusing pharmacokinetic and biopharmaceutic parameters. • The potential clinical pharmacokinetic problems and application of basics of pharmacokinetic
6		Computer Aided drug delivery System	• History of Computers in Pharmaceutical Research and Development • Computational Modeling of Drug Disposition • Computers in Preclinical Development • Optimization Techniques in Pharmaceutical Formulation • Computers in Market Analysis • Computers in Clinical Development • Artificial Intelligence (AI) and Robotics • Computational fluid dynamics(CFD)
7		Cosmetics a ndCosmeceuticals	• Key ingredients used i ncosmetics and cosmeceuticals. • Key building blocks for various formulations. • Various key ingredients and basic science to develop cosmetics and • cosmeceuticals • Scientific knowledge to develop cosmetics and with desired Safety, stability, and efficacy.

2. Department of Pharmacology

Sl. No.	Name of the Program	Name of the Course	Course Outcome

1	M Pharm	Advanced Pharmacology-I	• The students would appreciate the basicknowledge in the field of pharmacology pertaining to the drugs and its therapeutic applications • They would have elaborately learnt the recent advances in the drugs used for the treatment of various diseases. • They would have understood the concepts of drug action and mechanisms involved. • They would have discussed the pathophysiology and pharmacotherapy of certain diseases • They would have understood the underlying mechanism of drug actions at cellular and molecular level. • They would havelearnt the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
2		Screening methodsin Pharmacology	• The students would appreciate the knowledge gained on preclinical evaluation of drugs and recent experimental techniques in the drugdiscovery and development. • They would have understood the maintenance of laboratory animals as per the guidelines, basic knowledge of various *in-vitro* and *in-vivo* preclinical evaluation processes • They would have appraised the regulations and ethical requirement for the usage of experimental animals. • They would have learnt to describe the variousanimals used in the drug discovery processand good laboratory practices in maintenance and handling of experimental animals • They would have learnt to describe the variousscreening methods involved in the drug discovery process • They would appreciate to correlate the preclinical data to humans
3		Cellular a ndMolecular Pharmacology	• The students would have understood thefundamental knowledge on the structure and functions of cellular components.

			• They would appreciate the interaction of these components with drugs. This would enable them to apply the knowledge in drug discoveryprocess. • They would have learnt to explain the receptor signal transduction processes. • They would have learnt to explain the molecular pathways affected by drugs. • They would appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process. • They would have learnt to demonstrate molecular biology techniques as applicable for pharmacology.
4		Advanced Pharmacology-II	• The students would appreciate the basicknowledge in the field of pharmacology pertaining to the drugs and its therapeutic applications • They would have elaborately learnt the recent advances in the drugs used for the treatment of various diseases. • They would have understood the concepts of drug action and mechanisms involved. • They would have studied the pathophysiology and pharmacotherapy of certain diseases • They would have understood the underlying mechanism of drug actions at cellular and molecular level. • They would have learnt the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
5		Principles ofToxicology	• The students would appreciate the knowledge on the preclinical safety and toxicological evaluation of drug & new chemical entity. • They would have better understanding in the regulatory aspects for the toxicological evaluation of drugs and chemicals. • They would have studied the various types of toxicity studies and their procedure. • They would appreciate the importance of ethical and regulatory requirements for toxicitystudies. • They would have studied the practical skills required to conduct the preclinical toxicity studies. • They would appreciate the use of experimental

			animals for the different toxicological studies.
6		Principles of drug discovery	• The students would appreciate the knowledge on the basics of drug discovery. • They would have better understanding onthe various stages of drug discovery. • They would have studied the importance ofthe role of genomics, proteomics and bioinformatics in drug discovery. • They would have studied on the varioustargets for drug discovery. • They would have better understanding onthe lead seeking method and lead optimization • They would have learnt the importance of the role of computer aided drug desig nin drug discovery.
7		Clinical Pharmacology	• The students would appreciate the knowledge on the clinical research. • They would get a better understanding in the regulatory requirements for conducting clinical trial. • They would have understand the types of clinical trial designs. • They would have studied the responsibilities of key players involved in clinical trials • They would have an understand on the safety monitoring, reporting and close-outactivities. • They would have studied the principles of Pharmacovigilance

3. Pharmaceutical Analysis

Sl. No.	Name of the Program	Name of the Course	Course Outcome
1	M. Pharm.	Modern Pharmaceutical Analytical Techniques	• To understand the basic knowledge on assay of single and multiple component pharmaceuticals by using various analyticalinstruments • To develop basic practical skills using instrumentation techniques • Skills in selecting the suitable techniques for analysis of drugs and pharmaceuticals • To expand the theoretical knowledge on various instrumental techniques available for analysis of organic substances • To apply the knowledge learnt indeveloping new procedures of their owndesign • Comparing various methods of analysis and their outcomes
2		Advanced Pharmaceutical Analysis	• The student Will understand the concepts of Impurity profiling • The students will gain appropriate knowledge about appropriate analyticalskills required for the analysis of impurities in the bulk drugs and various formulations. • The subject supply enough idea on the categorizing the impurities LIKE (INORGANIC, ORGANIC AND RESIDUAL SOLVENTS) • It supports to understand the official andnon official methods to analyses the related substance.
3		Pharmaceutical Validation	• The Students learn on the importance of validation. • The student learns on the importance ofpatent and intellectual property rights. • The students are trained on thequalification aspects of instruments. • The importance of calibration to beperformed for the instruments. • The various validation aspects to be carriedout in the industry. • The students gain knowledge on how validation are carried for various components. Such as instrument

			validation, cleaning validation and process validation.
4		Food Analysis	• Student shall be able to understand variousanalytical techniques in the determination of Food constituents • Student shall be able to understand variousanalytical techniques in the determination of Food additives, • Student shall be able to understand variousanalytical techniques in the determination of Finished food products • Student shall be able to understand variousanalytical techniques in the determination of Pesticides in food • Student shall be able to understand variousanalytical techniques in the determination of knowledge on food regulations • Student shall be able to understand various analytical techniques in the determination of food legislations
5		Advanced Instrumentation Techniques	The student will know about • The detailed interpretation pattern for the organic substances • Theoretical aspects of the HPLC and GCtechniques • Practical aspects and troubleshootingtechniques for HPLC and GC techniques • Knowledge and skills in advanced instrumentation techniques for drug analysis • Theoretical aspects of hyphenated analytical techniques • Critical analysis of analytical problem and selection of appropriate analytical tool for the quantification of chemicals and excepients
6		Modern Bi o-analytical Techniques	• The subject provides enough knowledge to conduct bioequivalence studies • It upgrade the method to conduct bioequivalence study for formulations by utilizing the proper regulatory guidelines • It improvers ideas and updatinginformation on the current trend in GCP and GLP • Pupil will be exposed to both theoretical and practical knowledge on quantification

			of analyte present in the biological fluids • The subject content presents better understanding on different analyte enrichment technique as well the instrumentation technique.
7		Quality control and Quality Assurance	• Student shall be able to understand thecGMP aspects in a pharmaceutical industry • Student shall be able to understand theimportance of documentation • Student shall be able to understand the scope of quality certifications applicable to Pharmaceutical industries • Student shall be able to understand the responsibilities of QA department • Student shall be able to understand the responsibilities of QC department • Student shall be able to understand GLP and regulatory Affairs
8		Herbal a ndcosmetic analysis	• Student shall be able to understand thedetermination of herbal remedies • Student shall be able to understand various herbal regulations • Student shall be able to understand variousanalytical techniques in the determination of herbal products • Student shall be able to understand the herbal monographs • Student shall be able to understand various herbal drug interactions • Student shall be able to understand various performance evaluation of cosmetic products