Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the Institution are Stated and displayed on website and attainment of Pos and Cos are evaluated

PO 1 Pharmaceutical Sciences knowledge: Apply the knowledge of mathematics, science, pharmaceutical fundamentals, and a Pharmacy specialization to the solution of complex Pharmaceutical problems.

PO 2 Physicochemical properties of Formulations: The knowledge of importance of physical properties of the different pharmaceutical ingredients and the factors influencing them is very valuable for pharmaceutical dosage form design.

PO 3 Unit Operations: Pharm. Engineering renders knowledge about the basic unit operations that are taking place in pharmaceutical industry and the different factors associated with it. This information is useful for both pharmaceutics and pharmaceutical engineering.

PO 4 Entrepreneurship: The knowledge on different pharmaceutical dosage forms are imparted on students. This knowledge comes while handling a pharmacy or a manufacturing unit or in the further courses.

PO 5 Design/Development of solutions: The information on solid dosage forms like tablets and capsules, their formulation and quality control serves as an important perquisite for dosage form design.

PO 6 Application oriented Knowledge: The knowledge of biopharmaceutics enables the students to visualize the effect of pharmacokinetic (ADMET) parameters on the biological effect of the drug. The correlation of pharmacokinetics and pharmacodynamics is thus introduced and is experimentally explained to them.

PO 7 Environment and Sustainability: Enable extension of pharmaceutical dosage forms, and enables the students to learn about different packaging materials used in pharmaceutical industry and the factors governing their use.

PO 8 Conduct investigations of complex problems: To understand biopharmaceutical principles and pharmacokinetic principles through different compartment models, multiple dosage regimens, non-linear pharmacokinetics, and assessment of bioavailability and bioequivalence

PO9 Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO10 Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them

PSO1: Impart knowledge on the novel drug delivery systems, approaches, criteria for selection of polymers and drugs and their formulation and evaluation

PSO2: To impart knowledge and skills in generic drug development, various regulatory filings the approval process, and concept of generics across the globe

M PHARM I&II SEM COURSE OUTCOMES

PHARMACEUTICS

S.NO	YEAR/SEM	COURSE NAME	COURSE OUTOMES
1.	I-I	ADVANCED PHYSICAL PHARMACEUTICS	**CO1:** The students will know particle size analysis method, solid dispersion, physics of tablets, polymer classification and its applications
			CO2: student will also know the stability calculations, shelf life calculations and accelerated stability studies.
			CO3: They also know the rheology, absorption related to liquids and semi-solid dosage forms.
			CO4: They also know the factors affecting the dissolution and solubility in related to invitro/invivo correlations
2.	I-I	MODERN PHARMACEUTICS-I	**CO1:** Knowledge on pre formulation concepts and optimization techniques
			CO2: Knowledge on pharmaceutical validation
			CO3: Knowledge on cGMP & Industrial Management
			CO4: Knowledge on compression and compaction Knowledge on compression and compaction
3.	I-I	PHARMACEUTICAL VALIDATION	**CO1:** Explain the aspect of validation
			CO2: Carryout validation of manufacturing processes
			CO3: Apply the knowledge of validation to instruments and equipments
			CO4: Validation of analytical method for estimation of drugs
			CO1: Biopharmaceutics and pharmacokinetics and their significance.

4.	**I-I**	**APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS**	**CO2:** Use plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, and elimination.
			CO3: To understand the bioavailability and bioequivalence of drug products and their significance.
			CO4: Develop entrepreneurship skills that support the growth of the Pharmaceutical Industry
5.	**I-I**	**RESEARCH METHODOLOGY AND IPR**	**CO1:** Understand research problem formulation.
			CO2: Analyze research related information.
			CO2: Follow research ethics
			CO4: Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.

S.NO	YEAR/SEM	COURSE NAME	COURSE OUTOMES
1.	**I-II**	**MODERN PHARMACEUTICS - II**	**CO1:** students will understand the planning of pilot plant techniques used for all pharmaceutical dosage forms such as tablets, capsules, parenterals, aerosols, cosmetics and nutraceuticals
			CO2: student will be able to understand The elements of optimization techniques.
			CO3: student will be able to understand The validation master plan requirements as per FDA.
			CO4: student will be able to understand Industrial management and GMP considerations.
2.	**I-II**	**ADVANCED DRUG DELIVERY SYSTEMS**	**CO1:** Students will select the drugs for CDDS design of the formulation fabrication of systems of above drug delivery systems with relevant applications.
			CO2: Recognize the principles of physical, clinical, social, behavioral, health and pharmaceutical sciences

			CO3: Recognize the pharmaceutical dosage form design and the quality control of pharmaceutical formulations according to GMP and pharmacopeial requirements to support the pharmaceutical industries and research
			CO4: Define the different terminology as sustain, control, drug targeting, novel drug delivery.etc
3.	**I-II**	**HERBAL COSMETICS**	**CO1:** Students will learn about the raw materials used in herbal cosmetics and get exposed to various preparations of herbal cosmetics.
			CO2: Recognize the role of ingredients and herbs used in cosmeceutical products
			CO3: Elucidate the formulations in detail such that can innovate new products of similar health care objectives
			CO4: Description of several ingredients and their percentage involved in the production process will increase their ease of understanding of cosmetic product manufacturing.
4.	**I-II**	**NEUTRACEUTICALS**	**CO1:** Helps the student to understand the importance of Nutraceuticals in various common problems with the concept of free radicals
			CO2: To understand Functional foods and their effects on human health
			CO3: To understand the role of antioxidants, polyphenols, omega-3 fatty acids, to prevent different physiological disorders
			CO4: To Understand the importance of personalized food with respect to genetics

S.NO	YEAR/SEM	COURSE NAME	COURSE OUTOMES
1.	II-I	SCALE UP AND TECHNOLOGY TRANSFER	**CO1:** Manage the scale up process in pharmaceutical industry.
			CO2: Assist in technology transfer.
			CO3: To establish safety guidelines, which prevent industrial hazards.
			CO4: Demonstrate importance of Design qualification, Installation qualification, Operational qualification, Performance qualification.
2.	II-I	COSMETIC SCIENCE	**CO1:** Formulate and evaluate various cosmeceutical product.
			CO2: Know the key components used in different cosmeceutical products.
			CO3: Know the advanced current technology used for manufacturing the cosmetics at lab scale and industry scale
			CO4: students will learn manufacturing of the cosmetic products

ANALYSIS

S.NO	YEAR/SEM	COURSE NAME	COURSE OUTOMES
1.	I-I	MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES	**CO1:** The quantitative determination of various organic compounds is clearly understood..
			CO2: The spectral analysis, dissolution parameters and microbial assays are also learned.
			CO3: Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
			CO4: Perform quantitative & qualitative analysis of drugs using various analytical instruments.
2.	I-I	PHARMACEUTICAL FOOD ANALYSIS	**CO1:** Recall and recognize the key principles and characteristics of various food components, such as carbohydrates, proteins, lipids, vitamins, food additives, and pigments
			CO2: Understanding of the underlying chemistry and properties of food components.
			CO3: Understanding of refining fats and oils, detecting spoilage, and analyzing fermentation products.
			CO4: Analyze food samples and identify the presence of adulterants, contaminants, and pesticide residues.
3.	I-I	ADVANCED PHARMACEUTICAL ANALYSIS	**CO1:** Describe the instrumentation associated with UV-Visible spectroscopy, IR spectroscopy, spectrofluorimetric, flame emission spectroscopy, and atomic absorption spectroscopy, and choose appropriate solvents and conditions for these techniques and discuss the principles of potentiometry and ion-selective electrodes and their applications in pharmaceutical analysis.
			CO2: Explain the fundamental principles, laws, and theories underlying UV-Visible spectroscopy, IR spectroscopy, spectroflourimetry, flame emission spectroscopy, and atomic absorption spectroscopy.
			CO3: Apply the principles and instrumentation of various chromatographic techniques, such as thin-layer chromatography, high-performance liquid chromatography, gas chromatography, and electrophoresis, and apply these methods to separate and analyze pharmaceutical compounds.

			CO4: Analyze and interpret UV-Visible, IR, and fluorescence spectra to identify and characterize different compounds and understand the factors affecting their spectral features.
4.	**I-I**	\ **PHARMACEUTICAL QUALITY CONTROL AND QUALITY ASSURANCE**	**CO1:** Explain the concepts of quality control and quality assurance, providing an overview of ICH guidelines, and discussing the principles outlined in the QSEM guidelines.
			CO2: Analyze cGMP aspects within the pharmaceutical industry to understand their significance in ensuring product quality and regulatory compliance
			CO3: Evaluate the scope of quality certification applicable to the pharmaceutical industry to assess its impact on product quality, regulatory compliance, and overall business operations.
			CO4: Analyze manufacturing operations and controls within the pharmaceutical industry to understand their role in ensuring product quality, consistency, and compliance with regulatory standards.
5.	**I-I**	**RESEARCH METHODOLOGY AND IPR**	**CO1:** Explain how IPR would take such important place in growth of individuals & nation, to summarise the need of information about Intellectual Property Right to be promoted among student community in general & engineering in particular.
			CO2: Summarise the present day scenario controlled and monitored by Computer and Information Technology, where the future world will be ruled by dynamic ideas, concept, creativity and innovation.
			CO3: Analyse research related information and research ethics
			CO4: Relate that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits.

S.NO	YEAR/SEM	COURSE NAME	COURSE OUTOMES
1.	I-II	ADVANCED INSTRUMENTAL ANALYSIS-I	**CO1:** 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.
			CO2: Design and conduct experiments in the field of pharmaceuticals using advanced instrumental analysis to develop analytical methods.
			CO3: Outline the principles and pharmaceutical applications of supercritical fluid chromatography and capillary electrophoresis.
			CO4: Analyze pharmaceutical applications and principles of size exclusion chromatography, ion exchange chromatography, ion pair chromatography, and affinity chromatography in bio chromatography.
2.	I-II	MODERN BIOANALYTICAL TECHNIQUES	**CO1:** study of this subject builds the confidence in the minds on the students to develop and formulate high quality pharmaceutical products
			CO2: To develop the skills to understand the theory and practice of bio analytical techniques.
			CO3: To provide scientific understanding of analytical techniques and detail interpretation of results.
			CO4: To bridge the gap between academics, research and industry.
3.	I-II	HERBAL COSMETICS	**CO1:** Students will learn about the raw materials used in herbal cosmetics and get exposed to various preparations of herbal cosmetics.
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