



SANTHIRAM COLLEGE OF PHARMACY

Approved by AICTE & PCI, New Delhi - Affiliated to JNTUA, Anantapur
NH - 18, Nandyal, Kurnool District, Andhra Pradesh - 518501.

PROGRAMME: M. PHARMACY

DEPARTMENT OF PHARMACEUTICS

Programme Outcomes (POs)

1. Knowledge on principles of drug delivery system in the development of eco-friendly, efficacious dosage forms.
2. Ability to undertake multidisciplinary tasks in the pharmaceutical quality system.
3. Analyze, criticize, organize, improvise and manage documents, data and information related to pharmaceutical production process.
4. Absorb ethical practices and moral values in personal and professional endeavours.
5. Execute team based research to implement innovative solutions in the area of formulation, quality assurance and technology transfer.
6. Apply problem-based learning approach and analytical thinking in academic and professional
7. Validate the knowledge and skills gained through education to gain recognition in Pharmaceutical society and related field.
8. Set-up pharmaceutical production unit to design and formulate pharmaceutical dosage form.



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Course Outcome (CO's)

M.PHARM (Pharmaceutics I st Sem) PCI Regulation			
Modern Pharmaceutical Analytical Techniques	21S01101		Upon completion of the course student will be able to
		1	The analysis of various drugs in single and combination dosage forms
		2	Theoretical and practical skills of the instruments
Advanced Physical Pharmaceutics	21S03101	1	The students will know particle size analysis method, solid dispersion, physics of tablets, polymer classification and its applications
		2	Student will also know the stability calculations, shelf life calculations and accelerated stability studies.
		3	They also know the rheology, absorption related to liquids and semi-solid dosage forms.
		4	They also know the factors affecting the dissolution and solubility in related to <i>in vitro/in vivo</i> correlations.
Modern Pharmaceutics – I	21S03102	1	Students shall explain the preformulation parameters, apply ICH guidelines and evaluate drug, drug excipients compatibility.
		2	Students also explain about formulation and development, use of excipients in tablets, powders, capsules, micro-encapsules and coating techniques.
		3	They also learn and apply the statistical design in different formulations
Advanced Biopharmaceutics & Pharmacokinetics	21S03103	1	Students will be able to tell factors affecting the bioavailability and stability of dosage form; they also know the bioequivalence studies and protocols for bioequivalent studies.
		2	They also know the parameters for the disposition, absorption and Michaelis-Menton constants for nonlinear kinetics.
M.PHARM (Pharmaceutics II nd Sem) PCI Regulation			
Modern Pharmaceutics - Ii	21S03201	1	Students will understand the planning of pilot plant techniques



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			used for all pharmaceutical dosage forms such as tablets
		2	Students will understand the planning of pilot plant techniques used for all pharmaceutical dosage forms such as capsules, parenterals
		3	Students will understand the planning of pilot plant techniques used for all pharmaceutical dosage forms such as aerosols, cosmetics
		4	Students will understand the planning of pilot plant techniques used for all pharmaceutical dosage forms neutraceuticals
Advanced Drug Delivery Systems	21S03202	1	The students shall apply the pharmacokinetic and pharmacodynamic principles in the design of CDDS.
		2	Students will select the drugs for CDDS design of the formulation fabrication of oral, parenteral drug delivery systems
		3	Students will select the drugs for CDDS design of the formulation fabrication of Transdermal, implants Drug delivery systems
		4	Bio adhesives and targeted drug delivery systems.
Industrial Pharmacy	21S03203	1	The students will explain the machinery involved in milling, mixing, filtration, drying and packing material constructions used in the production of pharmaceutical materials
		2	They also learn salient feature1s of GMP, TQM applicable in industry.
		3	They also understand the effluent treatments and prevent the pollution.
		4	They also should evaluate the validation of analytical methods and processes
Nano Drug Delivery Systems	21S03204	1	The students should be able to select the right kind of materials, able to develop nano formulations with appropriate technologies
		2	Evaluate the product related test and for identified diseases



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DEPARTMENT OF INDUSTRIAL PHARMACY

Programme Outcomes (POs)

1. Smear the principles of the drug delivery system in the expansion of ecological, efficient dosage forms.
2. Advancement in taking multidisciplinary tasks in the pharmaceutical formulations and imparting quality in them.
3. Analyze, criticize, organize, Improvise and manage documents, data and information related to the pharmaceutical production process.
4. Imbibe ethical practices and moral values in personal and professional activities.
5. Implementing team-based research to implement innovative solutions in the area of formulation, evaluation, validation, technology transfer, artificial intelligence and in silico modeling.
6. Putting practical based learning tactic and innovative thinking in academics and profession
7. Authenticate the knowledge and skills expanded through education to gain gratitude in the Pharmaceutical industry
8. Assembling production unit in a lab then in a pilot plant which helps in designing and fabrication of pharmaceutical dosage forms in the industry.



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Course Outcome (CO's)

M.PHARM (Industrial Pharmacy I st Sem) PCI Regulation			
Advanced Instrumental Analysis	21S07201	1	Interpretation of the NMR, Mass and IR spectra of various organic compounds
		2	Theoretical and practical skills of the hyphenated instruments
		3	Identification of organic compounds
Advanced Physical Pharmaceutics	21S03101	1	The students will know particle size analysis method, solid dispersion, physics of tablets, polymer classification and its applications
		2	student will also know the stability calculations, shelf life calculations and accelerated stability studies.
		3	They also know the rheology, absorption related to liquids and semi-solid dosage forms.
		4	They also know the factors affecting the dissolution and solubility in related to <i>in vitro/in vivo</i> correlations.
Pharmaceutical Formulation Development	21S08101	1	Different machinery used for various steps in manufacture of various dosage forms.
		2	Formulation and evaluation of hard and soft gelatin capsules and their advantages over other dosage forms.
Advanced Biopharmaceutics And Pharmacokinetics	21S03103	1	Students will be able to tell factors affecting the bioavailability and stability of dosage form; they also know the bioequivalence studies and protocols for bioequivalent studies.
		2	Students will be able to tell factors affecting the bioavailability and stability of dosage form; They also know the bioequivalence studies and protocols for bioequivalent studies.
M.PHARM (Industrial Pharmacy II nd Sem) PCI Regulation			
Pharmaceutical Production Technology	21S08201	1	Students will know about the scale up and pilot plant techniques used for all pharmaceutical dosage forms like tablets
		2	Students will know about the scale up and pilot plant techniques used



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			for all pharmaceutical dosage forms like capsules, parenterals, aerosols
		3	Students will know about the scale up and pilot plant techniques used for all pharmaceutical dosage forms like cosmetics and nutraceuticals.
Advanced Drug Delivery Systems	21S03202	1	The students shall apply the pharmacokinetic and pharmacodynamic principles in the design of CDDS.
		2	Students will select the drugs for CDDS design of the formulation fabrication of oral, parenteral drug delivery systems
		3	Students will select the drugs for CDDS design of the formulation fabrication of Transdermal, implants Drug delivery systems
		4	Bio adhesives and targeted drug delivery systems.
Pharmaceutical Industrial Management	21S08203	1	This subject aims at validation of different process, equipment methods
		2	Effective management of waste materials.



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DEPARTMENT OF PHARMACOLOGY

1. Programme Outcomes (POs)

1. Relate the acquired scientific information and principles of pharmacokinetics and pharmacodynamics in drug discovery process.
2. Translate the high-level of understanding of drug action into key stages in preclinical and clinical research studies.
3. Apply skills to do specialized research in the core and applied areas of pharmaceutical sciences.
4. Evaluate current drug information in the delivery of pharmaceutical care and assure in regard to drug usage and their adverse effects
5. Demonstrate knowledge of professional and ethical responsibilities in clinical and nonclinical laboratory as required by regulatory bodies.
6. Develop an ability to visualize and work on multidisciplinary tasks in the area pharmaceutical and its allied field.
7. Appraise pharmacological model for investigation through logics and problem to solving ability.
8. Develop an ability to utilize novel tools in De novo drug design process to develop new drug candidates.



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Course Outcome (CO's)

M.PHARM (Pharmacology 1 st Sem) PCI Regulation			
Course	Course Code	CO's Number	Course Outcome (COs)
Modern Pharmaceutical Analytical Techniques	21S01101		Upon completion of the course student will be able to
		1	The analysis of various drugs in single and combination dosage forms
		2	Theoretical and practical skills of the instruments
Advanced Pharmacology- I	21S01102	1	Discuss the pathophysiology and pharmacotherapy of certain diseases
		2	Explain the mechanism of drug actions at cellular and molecular level
		3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
Clinical Pharmacology And Pharmacotherapeutics	21S01103	1	The pathophysiology of selected disease states and the rationale for drug therapy; the controversies in drug therapy
		2	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);
		3	Summarize the therapeutic approach to management of these diseases including reference. To the latest available evidence
		4	Therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).
		5	Pathophysiology and applied pharmacotherapeutics of diseases associated with following system/diseases with of special reference to the drug of choice
	21S01104	1	Explain the receptor signal transduction processes.



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Cellular And Molecular Pharmacology		2	Explain the molecular pathways affected by drugs.
		3	Appreciate the applicability of molecular pharmacology and biomarkers in drug discovery process.
		4	Demonstrate molecular biology techniques as applicable for pharmacology
M.PHARM (Pharmacology II nd Sem) PCI Regulation			
			Upon completion of the course student will be able to
Advanced Pharmacology – II	21S01201	1	Explain the mechanism of drug actions at cellular and molecular level
		2	Discuss the Pathophysiology and pharmacotherapy of certain diseases
		3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases
Pharmacological Screening Methods & Toxicology	21S01202	1	Appraise the regulations and ethical requirement for the usage of experimental animals.
		2	Describe the various animals used in the drug discovery process and good laboratory
		4	Describe the various newer screening methods involved in the drug discovery process
		5	Appreciate and correlate the preclinical data to humans
Principles Of Drug Discover	21S01203	1	Explain the various stages of drug discovery
		2	Appreciate the importance of the role of genomics, proteomics and bioinformatics in drug discovery
		3	Explain various targets for drug discovery
		4	Explain various lead seeking method and lead optimization
		5	Appreciate the importance of the role of computer aided drug design in drug discovery



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Clinical Research And Pharmacovigilance	21S01204	1	Explain the regulatory requirements for conducting clinical trial
		2	Demonstrate the types of clinical trial designs
		3	Explain the responsibilities of key players involved in clinical trials
		4	Explain the principles of Pharmacovigilance



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DEPARTMENT OF PHARMACEUTICAL ANALYSIS

Programme Outcomes (PO's)

1. Design and conduct analytical experiments for effective quality control system.
2. Utilize tools and skills to perform analytical research work using modern techniques.
3. Use knowledge and abilities to solve problem in pharmaceutical quality system.
4. Engage in innovative activities through creative thinking to envision better ways of accomplishing professional goals.
5. Exhibit behavior and moral values that required for a pharmaceutical analyst at the satisfaction of corporate industry, other health care providers.
6. Demonstrate the ability to work in team by combining individual strength, team dynamics and emotional intelligence.
7. Compare different techniques/technologies to assess and evaluate dosage forms for better quality.
8. Identify strategies for effective communication system to undertake multidisciplinary area at the interface of analytical method development.



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Course Outcome (CO's)

M.PHARM (Pharmacuetical Analysis 1st Sem) PCI Regulation			
Modern Pharmaceutical Analytical Techniques	21S01101		Upon completion of the course student will be able to
		1	The analysis of various drugs in single and combination dosage forms
		2	Theoretical and practical skills of the instruments
Advanced Pharmaceutical Analysis	21S07101	1	Appropriate analytical skills required for the analytical method development
		2	Principles of various reagents used in functional group analysis that renders necessary support in research methodology and demonstrates its application in the practical related problems.
		3	Principles of various reagents used in functional group analysis that renders necessary support in research methodology and demonstrates its application in the practical related problems.
Pharmaceutical And Food Analysis	21S07102	1	various analytical techniques in the determination of Food constituents
		2	various analytical techniques in the determination of Food additives
		3	various analytical techniques in the determination of Finished food products
		4	various analytical techniques in the determination of Pesticides in food Pharmaceuticals (API & Dosage forms), And also student shall have the knowledge on food regulations and legislations
Quality Control And Quality Assurance	21S07103	1	The cGMP aspects in a pharmaceutical industry
		2	To appreciate the importance of documentation
		3	To understand the scope of quality certifications applicable to Pharmaceutical industries
		4	To understand the responsibilities of QA & QC departments



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M.PHARM (Pharmacuetical Analysis IInd Sem) PCI Regulation			
Advanced Instrumental Analysis	21S07201	1	Interpretation of the NMR, Mass and IR spectra of various organic compounds
		2	Theoretical and practical skills of the hyphenated instruments
		3	Identification of organic compounds
Modern Bio-Analytical Techniques	21S07202	1	Extraction of drugs from biological samples
		2	Separation of drugs from biological samples using different techniques
		3	Guidelines for BA/BE studies.
Pharmaceutical Validation	21SOE301a	1	Explain the aspect of validation
		2	Carryout validation of manufacturing processes
		3	Carryout validation of manufacturing processes
		4	Validate the manufacturing facilities
Herbal And Cosmetic Analysis	21S07203	1	Determination of herbal remedies and regulations
		2	Analysis of natural products and monographs
		3	Determination of Herbal drug-drug interaction
		4	Principles of performance evaluation of cosmetic products.