



# **NARAYANA PHARMACY COLLEGE**

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Chinthareddypalem, Nellore-524003, A.P. India.

Phone & Fax No :0861-2317966; Cell No :+91- 9392901053

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S.No.	SUBJECT NAME	SUBJECT CODE	CO - NUMBER	COURSE OUTCOMES
I	Human Anatomy Physiology	17T00101	C101.1	They would Define the gross anatomy, histology and physiology of various organs of the human body.
			C101.2	To identify the various tissues and organs associated with the different organ systems with help of charts and specimens
			C101.3	They would have summarize the coordination in functioning of different organs of each system.
			C101.4	To understand the several physiological homeostatic mechanisms and their imbalances in human body.
			C101.5	To assess the interlinked mechanisms in the maintenance in normal and physical exercise conditions.
			C101.6	To implement and perform the hematological tests parameters, blood pressure recording, heart rate, pulse and respiratory volumes.
	Pharmaceutics	17T00102	C102.1	To understand formulation aspects of dosage forms
			C102.2	To apply the formulation principles in designing the dosage forms
			C102.3	To apply the principles of formulation in pharmaceutical calculations
			C102.4	To create or design different types of dosage forms
			C102.5	To evaluate the dosage forms
			C102.6	To understand the importance of good formulation for effectiveness.
	Medicinal Biochemistry	17T00103	C103.1	Define the basic concepts in medicinal biochemistry and clinical chemistry
			C103.2	link the biochemical reaction and pathways of several diseases
			C103.3	Explain laboratory values in chemical chemistry
			C103.4	To use the scientific laboratory equipment in order to garther and analyse data on medicinal biochemistry
			C103.5	To know how physiological conditions influence the structures and re -activities of bio molecules.
			C103.6	To interpret how the biomolecules acts on the body and its mechanism
Pharmaceuti	17T00104	C104.1	Explain the physical properties, acid base theories and	

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cal Organic Chemistry		isomerism of organic compounds.	
	C104.2	List the IUPAC nomenclature of functional groups, free radicals & cyclo alkane reactions & reactivity.	
	C104.3	Describe the mechanisms, Nucleophilic substitutions, elimination, addition reactions.	
	C104.4	Discuss the concept of resonance, hyperconjugation, conjugated dienes & its orientation and reactivity.	
	C104.5	Explain the concepts of electrophilic aromatic substitution, nucleophilic addition reaction mechanisms.	
	C104.6	Discuss the emphasis of normal reactions and their mechanisms	
Pharmaceutical Inorganic Chemistry	17T00105	C105.1	Well acquainted with the principles of limit tests.
		C105.2	Familiar with different classes of inorganic pharmaceuticals and their analysis
		C105.3	Identification of different anions, cations and different inorganic pharmaceuticals.
		C105.4	Knowledge about the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
		C105.5	Understand the medicinal and pharmaceutical importance of inorganic compounds
		C105.6	To have been introduced to a variety of inorganic drug classes.
Remedial Biology	17T00106	C106.1	Acquire knowledge of the basic components of anatomy and physiology of plants and animals.
		C106.2	Recognize about the different cell inclusions, cell wall components.
		C106.3	Acquire knowledge of morphology of different parts of flowering plants
		C106.4	Identify and understand the various tissue systems and organ systems in plants and animals.
		C106.5	Classify and remember the salient features of five kingdoms of life.
		C106.6	Discuss and assess anatomy physiology of plants and animals.
Remedial Mathematics	17T00106	C106.1	Apply mathematical concepts and principles to perform computations for Pharmaceutical Sciences.
		C106.2	Communicate mathematical knowledge and understanding to help in the field of Clinical Pharmacy
		C106.3	To solve the different types of problems by applying theory

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		C106.4	Perform abstract mathematical reasoning
		C106.5	To solve the different types of problems by applying theory
		C106.6	To know the theory and their application in Pharmacy
Human Anatomy and Physiology Lab	17T00107	C107.1	Relate concept of the Human Anatomy physiology
		C107.2	Adapt knowledge about Human anatomy and Physiology
		C107.3	Analyze the physiological processes discussed in theory classes through experiments on living tissue
Pharmaceutics-Lab	17T00108	C108.1	apply practical skills in preparing and dispensing various pharmaceutical formulations, including syrups, elixirs, linctus, solutions, liniments, suspensions, emulsions, powders, and suppositories, with an emphasis on accuracy and adherence to pharmacopeial standards.
		C108.2	apply a comprehensive understanding of the physical and chemical properties of different dosage forms and their therapeutic applications, including handling incompatibilities and ensuring the stability and efficacy of the products.
		C108.3	apply proficiency in practical laboratory techniques, proper use of dispensing tools and materials, and adherence to safety and hygiene practices, ensuring effective and safe pharmaceutical compounding and dispensing.
Medicinal Biochemistry- Lab	17T00109	C109.1	Qualitatively analyze the normal and abnormal constituents of urine
		C109.2	Quantitatively estimate the various constituents present in blood
		C109.3	Study the factors affecting enzymatic activity
Pharmaceutical Organic Chemistry-Lab	17T00110	C110.1	Demonstrate proficiency in fundamental organic chemistry techniques such as purification methods (like recrystallization and chromatography), synthesis of organic compounds.
		C110.2	Identify the organic functional groups using Qualitative Analysis
		C110.3	Develop skills in laboratory safety protocols and adhere to good laboratory practices (GLP) throughout experimental procedures. They will demonstrate awareness of chemical hazards, proper handling of reagents and equipment, and effective waste disposal practices in accordance with regulatory guidelines.



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II	Pharmaceutical Inorganic Chemistry-Lab	17T00111	C111.1	Gain the fundamentals of volumetric analytical skills analytical techniques in lab.
			C111.2	Determine various impurities in inorganic drugs and pharmaceuticals.
			C111.3	Identify and determine test for purity and preparation of some inorganic compounds.
	Remedial Biology-Lab	17T00112	C112.1	Construct and develop microscopic sections of parts of the plant.
			C112.2	Identify and study different animal specimen.
			C112.3	Demonstrate the Various systems of frog using computer model.
Phatophysiology	17T00201	C201.1	Apply the knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications.	
		C201.2	Evaluate the basic Patho-physiological mechanisms in various diseases.	
		C201.3	Explain the Etio-pathogenesis of selective diseases.	
		C201.4	Discuss the pathogenesis and morphology of reversible and irreversible cell injury.	
		C201.5	Describe various lipoproteins and lipoprotein disorders, with acute and chronic inflammation, cancer, auto immune diseases with biological significance of hypersensitivity disorders	
		C201.6	Explain the baseline knowledge and application in other subject of pharmacy.	
Pharmaceutical Microbiology	17T00202	C202.1	Explain the various classifications of Microorganisms based on morphological characters.	
		C202.2	Demonstrates methods used in identification and cultivation of microbes in lab.	
		C202.3	Illustrates the sterilization types and their application with merits and demerits.	
		C202.4	States the procedures to perform diagnostic tests to identify harmful diseases.	
		C202.5	Describe possible modes of disease transmission, disease symptoms, treatment methods.	
		C202.6	Knowing the industrial applications of Microorganisms in industry to produce Biotechnological products.	
Pharmacognosy & Phytopharmaceuticals	17T00203	C203.1	Explain various sources of crude drugs and their application along with the knowledge of different classification systems	
		C203.2	Describe about the cultivation, collection and	

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			processing of crude drugs along with the systematic evaluation of crude drugs
		C203.3	Explain about the plant cell wall, its constituents and cell inclusions
		C203.4	Illustrate the macroscopic, microscopic and powder microscopic evaluation and its significance in evaluation of drugs.
		C203.5	Discuss the pharmacognosy of Natural Pesticides
		C203.6	Describe the various plant fibres used in surgical dressings and related products.
Pharmacology - I	17T00204	C204.1	State the different drugs used with an emphasis on its classification, Pharmacodynamic and pharmacokinetic aspects, adverse effects, Therapeutic uses.
		C204.2	Explain the dose, route of administration, precautions, and contraindications.
		C204.3	Describe the pharmacological aspects of drugs used to treat ailment of different organ systems of the body.
		C204.4	Explain the importance of drug discovery by preclinical and clinical trials.
		C204.5	Explain the pharmacological knowledge as a basis of therapeutics.
		C204.6	Apply the knowledge of drugs and its detailed description therapeutically in clinical case scenario.
Community Pharmacy	17T00205	C205.1	Explain the patient centered care to diverse patients using the best available evidence to devise, modify, implement, document and monitor pharmacotherapy care plans, either independently or as part of healthcare team.
		C205.2	Describe the knowledge of the business and professional practice management skills in community pharmacies.
		C205.3	Explain the patient education through counselling & provide health screening services to public
		C205.4	Describe symptoms of minor ailments and provide appropriate medication
		C205.5	Explain the programmes involved in prevention of communicable diseases
		C205.6	Describe the professional ethics by promoting safe and appropriate medication use throughout society
Pharmacotherapeutics -I	17T00206	C206.1	Students will be able to describe the pathophysiology and management of cardiovascular respiratory and endocrine diseases
		C206.2	Students will be developing Patient case based

  
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		Assessment Skills	
		C206.3	Students will be able to describe the quality use of medicines issues surrounding the therapeutic agents in the treatment of these diseases
		C206.4	Students will have developed clinical skills in the therapeutic management of these conditions
		C206.5	Continue to develop communication skills.
		C206.6	Students will provide patient – centred care to diverse patients using the evidence based medicine
Pharmaceutical Microbiology lab	17T00207	C207.1	Understand various sterilization techniques & gain experience to handle sterilization apparatus.
		C207.2	Student can able to perform Biochemical tests for understand chemical reactivity of microbes.
		C207.3	Hands on experience in preparing Culture media for cultivation of useful microbes.
Pharmacognosy & Phytopharmaceuticals lab	17T00208	C208.1	Describe the handling of the compound microscope and identification of the various diagnostic features of crude drugs.
		C208.2	Explain the analysis of unorganized crude drugs by various chemical tests.
		C208.3	Describe the various quantitative tests for lipid analysis and its significance.
Pharmacotherapeutics-I - Lab	17T00209	C209.1	Identify drug interactions and rationalize the prescription
		C209.2	Discuss the therapeutic approach to management of selected diseases
		C209.3	Prepare individualized therapeutic plans based on diagnosis
III Pharmacology - II	17T00301	C301.1	Describe about the different drugs used for treatment of diseases.
		C301.2	List the drugs used to cancer, inflammation, respiratory system, GIT, immune system and hormones and explain their pharmacology.
		C301.3	Explain the principles of animal toxicology and bioassay procedures.
		C301.4	Discuss the cell, macromolecules, cell signaling, DNA replication and cell cycle.
		C301.5	Describe importance of gene and its structure, genome, gene expression, recombinant DNA technology and other associated aspects.
		C301.6	Apply the knowledge of drugs practically and performed simulated pharmacological experiments.
Pharmaceuti	17T00302	C302.1	List the significance of analysis in the pharmaceutical

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cal Analysis		sector.	
	C302.2	Explain the information regarding pharmaceutical substance testing and merchandise.	
	C302.3	Discuss instrumental techniques to build fundamental practical skills.	
	C302.4	Describe the several instrumental methods used in pharmaceutical analysis.	
	C302.5	Apply the knowledge to suit different assay procedures for medications and medicines.	
	C302.6	Describe and learn the troubleshooting techniques while implementing different approaches and instrumental way	
Pharmacothe rapeutics -II	17T00303	C303.1	To know the pathophysiology of selected disease states and the rationale for drug therapy.
		C303.2	To understand the therapeutic approach for management of different diseases.
		C303.3	To know the importance of preparation of individualized therapeutic plans based on diagnosis & controversies in drug therapy.
		C303.4	To understand & identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy.
		C303.5	Explain the etio-pathogenesis of selected infectious diseases, musculoskeletal and renal disorders.
		C303.6	Discuss the principles of cancer therapy and dermatological disorders.
Pharmaceuti cal Jurisprudenc e	17T00304	C304.1	Describe the practice of professional ethics
		C304.2	Explain various concepts of pharmacy legislation in india
		C304.3	Discuss various parameters in DC act and rules
		C304.4	Explain about drug policy,DPCO,patent and design act
		C304.5	Explain labeling requirements and packaging guide lines for d & c
		C304.6	Explain the concept of dangerous drug act,pharmacy act and excise duties act
Medicinal Chemistry	17T00305	C305.1	Describe the process of drug design, QSAR, Prodrug concepts, CADD and combinatorial Chemistry
		C305.2	Explain the SAR, MOA, Synthesis, Uses, Adrs, and list of Brand Names of Anti-infective agents
		C305.3	Describe the classification, chemistry, SAR, MOA, Uses ,Adrs, list of brand names and synthesis of some antibiotics


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		C305.4	Discuss the historical background and classification, chemistry, SAR, MOA, Uses, Adrs, brand names and synthesis of some antibiotics.
		C305.5	Explain the chemistry, SAR, MOA, Uses, Adrs and Brand names of some anti malarials, sulphonamides, hypoglycemics
		C305.6	List the CVS diseases and explain the classification, chemistry of CVS drugs with their SAR, MOA, Uses, Adrs, Brand names and few important drug synthesis
Pharmaceutical Formulations	17T00306	C306.1	Demonstrate detailed knowledge on different types of dosage forms and their application in the management of clinical therapy.
		C306.2	Describe different tablet dosage forms, coating and related concern for design & development of tablet dosage form
		C306.3	Develop dosage form and related concern for design of capsule dosage form.
		C306.4	Design and develop sterile liquid dosages forms to treat various clinical diseases.
		C306.5	Develop Semisolid Dosage forms with acceptable patient compliance.
		C306.6	Describe suitable criteria and various approaches for development of novel drug delivery systems.
Pharmacology- II-Lab	17T00307	C307.1	Identify the drugs confidently in experiments.
		C307.2	Interpret the results of biological samples in experimental pharmacology.
		C307.3	Demonstrate the pharmacological experiments
Pharmaceutical Analysis-Lab	17T00308	C308.1	Perform paper and thin layer chromatographic experiments and gain the knowledge on interpretation of data obtained after the experiment to conclude the results.
		C308.2	Handle different instruments like spectrophotometers, flame photometer, HPLC and GC to analyse the pharmaceutical compounds.
		C308.3	Have ability to develop basic practical skills using instrumental techniques.
Pharmacotherapeutics-II - Lab	17T00309	C309.1	Identify drug interactions and rationalize the prescription.
		C309.2	Conduct patient counseling
		C309.3	Discuss the therapeutic approach to management of selected diseases.
Medicinal	17T00310	C310.1	Demonstrate the proficiency in medicinal chemistry

  
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Chemistry Lab			techniques such as synthesis and purification of pharmaceutical compounds.
	C310.2		Explain chemical and physical properties relevant to drug design, and evaluation of drug-receptor interactions using computational methods.
	C310.3		Apply their knowledge of medicinal chemistry to propose strategies for drug design and optimization.
Pharmaceutical Formulations Lab	17T00311	C311.1	Demonstrate practical skills in preparing and dispensing various pharmaceutical formulations. like solid liquid and semi solid dosage forms
		C311.2	Explain Physical and chemical properties of different dosage forms and their therapeutic applications
		C311.3	apply practical laboratory evaluation techniques for proper use of dispensing tools and materials, ensuring effective and safe pharmaceutical compounding and dispensing.
Pharmacotherapeutics- III	17T00401	C401.1	Explain the etiopathogenesis of selected gastrointestinal, haematological, neurological and psychiatric diseases.
		C401.2	Discuss the principles of evidence-based therapy and pain management.
		C401.3	Identify the patient-specific parameters relevant in initiating and monitoring drug therapy and adverse effects.
		C401.4	Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy.
		C401.5	Prepare individualized therapeutic plans based on diagnosis.
		C401.6	Recognize the role of pharmacist in essential and rational drug use.
Hospital Pharmacy	17T00402	C402.1	Describe the functioning of hospital pharmacy for identification and assessment of adverse drug reactions.
		C402.2	Describe the functions and responsibilities of hospital and clinical pharmacist
		C402.3	Establishment of pharmacy and therapeutic committee, to develop the contents of hospital formulary and adapt to drug distribution system in the hospital.
		C402.4	Describe the establishment of drug store to manage and implement inventory control techniques.
		C402.5	Explain the manufacturing practices of various formulations in hospital.
		C402.6	Describe the continuing professional development

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			programs
Clinical Pharmacy	17T00403	C403.1	Monitor drug therapy of patient through medication chart review and clinical review
		C403.2	Obtain medication history interview and counsel the patients
		C403.3	Identify and resolve drug related problems
		C403.4	Detect, assess and monitor adverse drug reaction
		C403.5	Interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
		C403.6	Retrieve, analyze, interpret and formulate drug or medicine information.
Biostatistics & Research Methodology	17T00404	C404.1	To understand the applications of Biostatistics in Pharmacy.
		C404.2	Appreciate the statistical technique in solving the pharmaceutical problems
		C404.3	Appreciate the importance of Computer in hospital and Community Pharmacy
		C404.4	Operate various statistical software packages
		C404.5	Deal with descriptive statistics, Graphics, Correlation, Regression, logistic regression Probability theory, Sampling technique, Parametric tests, Non -parametric tests. ANOVA, Introduction to Design of Experiments, Phases of Clinical trials and Observational and Experimental studies, SPSS, R and MINITAB statistical software's, analyzing the statistical data using Excel.
		C404.6	Know the various statistical methods to solve different types of problems
Biopharmaceutics & Pharmacokinetics	17T00405	C405.1	Understand different mechanism and factors affecting ADME processes.
		C405.2	Determine the effect of Pharmacokinetic (ADME) parameters on the biological effects of the drug
		C405.3	Understand various pharmacokinetic models and their significance in interpreting various pharmacokinetic parameters
		C405.4	Attain knowledge about multiple dosage regimens and nonlinear pharmacokinetics
		C405.5	Understand about non compartmental pharmacokinetics
		C405.6	Ability to design a basic protocol for the conduct of BA/BE study and the interpretation of the BA/BE data
Clinical	17T00406	C406.1	Explain the principles and practice of clinical

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Toxicology			toxicology
		C406.2	Demonstrate an understanding of the health implications of toxic exposures and commonly involved chemicals for toxicity
		C406.3	Demonstrating and understanding of general toxicology principles and apply them in clinical management practice
		C406.4	Explain the history, assessment, and therapy considerations associated with the management of a toxic exposure
		C406.5	Demonstrate an understanding of the characteristics of and treatment guidelines for specific toxic substances
		C406.6	Propose several preventive approaches to reduce unintentional poisonings
Pharmacotherapeutics-III- Lab	17T00407	C407.1	To understand therapeutic goals of the drugs used in different diseases
		C407.2	To understand dose and frequency of the medications
		C407.3	To understand the time-course of clinical and laboratory indices of therapeutic response and adverse effects
Hospital Pharmacy- Lab	17T00408	C408.1	Demonstrate the skills on determination of inventory control of pharmaceuticals.
		C408.2	Carryout lab activities related to the bulk and unit dose preparations.
		C408.3	Demonstrate the skills related to identification, assessing and reporting of adverse drug reactions.
Clinical Pharmacy- Lab	17T00409	C409.1	Assess prescriptions for drug interaction and answer drug information query
		C409.2	Perform patient counselling on medication and conduct medication history interview
		C409.3	Analyse and interpret the data obtained through laboratory tests
Biopharmaceutics & Pharmacokinetics- Lab	17T00410	C410.1	Learn practically about various techniques to improve the solubility and dissolution rate of poorly soluble drugs.
		C410.2	Determine various pharmacokinetic parameters using semilogarithmic graph paper as well as by using various soft wares
		C410.3	Determine various absorption and protein binding studies in ex vivo models.
V Clinical Research	17T00501	C501.1	Understand how new drugs are developed.
		C501.2	Recognize the moral and legal obligations.

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		C501.3	Respect and carry out the clinical trial procedures
		C501.4	Be familiar with clinical trial safety reporting and monitoring.
		C501.5	Oversee the procedure of trial coordination
		C501.6	Understand Sponsor, the Institutional Review Board, and the Investigator have different responsibilities.
Pharmacoepidimology and Pharmacoecconomics	17T00502	C502.1	Describe the methods used in Pharmacoepidemiology
		C502.2	Demonstrate competency in the design, conduct and evaluation of Pharmacoepidemiology studies.
		C502.3	Describe the methods used in Pharmacoecconomic analysis.
		C502.4	Demonstrate competency in the design, conduct and evaluation of Pharmacoecconomic studies.
		C502.5	evaluation of safety of medications in populations.
		C502.6	it involves assessing and quantifying various outcomes related to medication use and its impact on health
Clinical Pharmacokinetics & Pharmacotheapeutics Drug Monitoring	17T00503	C503.1	understand and apply the principles of clinical pharmacokinetics and their application in designing dosage regimens.under
		C503.2	understand and apply nomograms and tabulations for dose calculation and conversion between intravenous and oral dosing.
		C503.3	understand and apply appropriate doses and dosing intervals, considering factors such as age, weight, and disease states.
		C503.4	understand pharmacokinetic interactions and their implications in clinical practice.
		C503.5	understand mechanisms of inhibition and induction of drug metabolism and biliary excretion.
		C503.6	understand and apply the concept and significance of therapeutic drug monitoring (TDM).
Clerkship	17T00504	C504.1	Describe the content of a health supervision visit and the factors used to determine the frequency of such visits.
		C504.2	Utilize knowledge of the developmental stages in the interaction of the patient and physician in the clinical setting.
		C504.3	Effectively communicate information about the diagnosis and treatment to the patient
Project Work	17T00505	C505.1	Identify the research problem by thorough literature survey.
		C505.2	Apply efficient methods for designing project



## **NARAYANA PHARMACY COLLEGE**

(Approved by PCI & AICTE, New Delhi) (Affiliated to JNTUA Ananthapuramu)

Recognized u/s 2(f) & 12(B) of the UGC Act, 1956, New Delhi.

ISO 9001:2015 Certified Institution

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		C505.3	Demonstrate the completed project work and compile the project report.
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