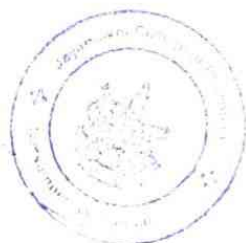


## PHARM.D COURSE OUTCOMES

### I Year Pharm.D

	After studying this course student will be able to:
1	Describe the structure (gross and histology) and functions of various organs of the human body
2	Discuss the various homeostatic mechanisms and their imbalances of various systems
3	Identify the various tissues and organs of the different systems of the human body
4	Recognize coordinated working pattern of different organs of each systems
5	Recognize the interlinked mechanisms in the maintenance of normal functioning of human body
	<b>Human Anatomy and Physiology (Practical)</b>
1	Illustrate different types of Tissues and explain various Anatomical models
2	Identify the bones of Skeletal system
3	Determine Blood cell count, Hemoglobin, Blood grouping, ESR, Bleeding time and Clotting time
4	Record Blood Pressure, Pulse rate, Body temperature
5	Identify family planning devices and conduct Pregnancy diagnosis test
6	Conduct planned experiments and prepare laboratory report in a standard format
	<b>Pharmaceutics (Theory)</b>
1	Describe the evolution of Pharmacy and Pharmacopoeias
2	Discuss the need and identification of different dosage forms
3	Design a suitable formulation/dosage form with the use of appropriate ingredients
4	Discuss the different techniques involved in formulation of a dosage form
6	Prepare appropriate labels and recommend storage conditions for dosage forms
	<b>Pharmaceutics (PRACTICAL)</b>
1	Formulate various solid and liquid dosage forms
2	Demonstrate different techniques involved in formulation
3	Identify and apply the suitable remedial measures to solve instabilities observed in formulations
4	Prepare appropriate labels for dosage forms
5	Conduct planned experiments and prepare laboratory report in a standard format
	<b>Medicinal Biochemistry(Theory) Course Outcomes</b>
1	Describe the concepts of biological oxidation and bio energetics
2	Explain the metabolism of carbohydrate, proteins and lipids
3	Discuss various concepts of nucleotides and nucleic acids
4	Recognise and discuss the role of catalytic activity of enzymes and importance of isoenzymes in diagnosis of disease
5	Discuss the principles, significance and methods of different biochemical tests
6	Interpret the results of biochemical tests such as lipid profile test, liver and kidney function tests
	<b>Medicinal Biochemistry(Practical) Course Outcomes</b>
1	Determine the biomolecules by qualitative and quantitative analysis of urine and blood samples



*S. Venkatesh*

Principal  
Jayanukhi College of Pharmacy  
Narsampet-506 333

2	Interpret the metabolic disorders based on laboratory values
3	Interpret the lipid profile and liver function tests
4	Determine various electrolytes in serum
5	Operate and handle appropriate standard instruments
6	Conduct planned experiments and prepare laboratory report in a standard format
<b>Pharmaceutical Organic Chemistry(Theory) Course Outcomes</b>	
1	Explain the physical properties of organic compounds
2	Identify the structures of a given organic compound and give the nomenclature
3	Explain the mechanisms involved in various organic reactions
4	Discuss the reactivity, orientation and stability of organic reactions
5	Identify the products obtained through simple organic reactions
6	Summarize the studies on some important official organic compounds
<b>Pharmaceutical organic chemistry (Practical)</b>	
1	Synthesize simple organic compounds by different organic reactions
2	Apply stereo models and explain the structural aspects of organic compounds
3	Detect the extra elements (N,S and X) present in the compounds
4	Identify various classes of organic compounds by systematic qualitative analysis
5	Prepare suitable solid derivatives from organic compounds
6	Conduct planned experiments and prepare laboratory report in a standard format
<b>Pharmaceutical Inorganic Chemistry(Theory) Course Outcomes</b>	
1	Explain the effects of impurities in pharmaceuticals
2	Discuss the principles and methodology of limit tests for common impurities in pharmaceutical substances
3	Suggest methods to prepare inorganic pharmaceuticals
4	Recommend storage conditions for inorganic pharmaceuticals
5	Estimate the inorganic medicinal substances and interpret their percentage purity
6	Explain basics of radio activity and recognize the role of essential trace elements
<b>Pharmaceutical Inorganic Chemistry( Practicals) Course Outcomes</b>	
1	Identify the impurities in given inorganic compounds by performing limit tests.
2	Analyze the purity of compound quantitatively by performing assays.
3	Use different methods to prepare inorganic pharmaceuticals.
4	Perform identification tests as per Indian Pharmacopoeia.
5	Determine the impurities qualitatively by performing test for purity
6	Conduct planned experiments and prepare laboratory report in a standard format
<b>Remedial Biology-(Theory)</b>	
1	Explain the classification of plants, plant cell and its organelles, types of tissues and their functions
2	Explain physiological aspects of plants

*S. Srinivas*


Principal

Jayamukhi College of Pharmacy  
Narsampet-506 332



3	Describe taxonomical characters of various families
4	Classify plants based on morphological and microscopical characters
5	Identify a given plant part based on its morphological and microscopical characters
6	Discuss structure and life history of parasites/insects
<b>Remedial Biology(Practical)</b>	
1	Identify cell wall constituents and cell inclusions
2	Identify the crude drugs by its morphological characteristics and study the anatomical characters by preparing slides
3	Perform experiments related to plant physiology
4	Identify different parts of frog digestive system
5	Conduct planned experiments and prepare laboratory report in a standard format
<b>Remedial Mathematics-(Theory)</b>	
1	Explain the principles of matrix algebra, determinants, Trigonometry, Analytical Geometry, Differential Calculus, Integral Calculus, Differential Equations and Laplace Transforms
2	State and explain the important theorems such as Cayley-Hamilton Theorem, adjoint Cramer's rule and Leibnitz Theorem
3	Identify the appropriate standard form for a given differential equation
4	Solve simple and complex mathematical problems associated with on trigonometry and analytical geometry
5	Solve simple mathematical problems associated with on matrix algebra, differential and integral calculus as well as Laplace Transforms
6	Solve complex mathematical problems associated with on matrix algebra, differential equations, differential and integral calculus as well as Laplace Transforms
<b>II Year Pharm.D Pathophysiology-(Theory)</b>	
1	Explain the pathogenesis and morphology of reversible and irreversible cell injury; enumerate various lipoproteins and describe lipoprotein disorders
2	Illustrate events involved in acute and chronic inflammation
3	Recognize the biological significance of various hypersensitivity disorders
4	Discuss the mechanisms involved in autoimmune diseases and allograft rejection
5	Discuss the etiopathogenesis of selected diseases
6	Describe the general biology of cancer, mechanism of shock and effects of radiation exposure
<b>Pharmaceutical Microbiology Course Outcomes</b>	
1	Identify the key growth parameters required by micro-organisms
2	Explain the principles of sterilization used in the pharmaceutical industry
3	Explain the principles of sterility testing and microbiological quality control of pharmaceuticals
4	the concepts of immunology and interpolate the same in disease diagnosis
5	Analyze the techniques for microbiological assays



  
 Jayashankar College of Pharmacy  
 Narsampet-506 332

	<b>Pharmaceutical Microbiology(Practical) Course Outcomes</b>
1	After studying this course, student will be able to:
2	Prepare various culture media for the growth of microorganisms
3	Identify and isolate bacteria
4	Demonstrate aseptic procedures
5	Carry out sterilization and sterility testing of pharmaceuticals
6	Evaluate antimicrobials and determine the MIC of antimicrobial agents
7	Conduct planned experiments and prepare laboratory report in a standard format
	<b>Pharmacognosy &amp; Phytopharmaceuticals</b>
1	Define Pharmacognosy and describe its evolution
2	Explain the classification of crude drugs and discuss their primary and secondary metabolites
3	Discuss various parameters related to cultivation, collection, processing and storage of crude drugs
4	Analyse morphological and microscopical characters of crude drugs
5	Discuss the production, evaluation, uses and adulterants of crude drugs
6	Identify the market samples of drugs containing proteins, carbohydrates and lipids
	<b>Pharmacognosy &amp; Phytopharmaceuticals(Practicals) Course Outcomes</b>
1	Identify cell wall constituents and cell inclusions
2	Identify the crude drugs by its morphological characteristics and study the anatomical characters by preparing slides
3	Perform chemical tests to identify unorganized crude drugs and lipids
4	Prepare herbarium sheets
5	Conduct planned experiments and prepare laboratory report in a standard format
	<b>Pharmacology I</b>
	<b>Course Outcomes</b>
1	Discuss pharmacokinetics and pharmacodynamics of a drug
2	Recognize the factors modifying drug action
3	Identify drug interactions and detect adverse drug reactions
4	Classify and explain the pharmacology of drugs acting on various systems
	<b>Community Pharmacy</b>
	<b>Course Outcomes</b>
1	Discuss the roles and responsibilities of community pharmacist
2	Outline the layout and infrastructure requirements for community pharmacy
3	Recognise the need of inventory control and discuss the various methods
4	Discuss the factors affecting medication adherence
5	Perform general patient counseling
6	Apply health screening services in community pharmacy
	<b>Pharmacotherapeutics I ( Theory) Course Outcomes</b>

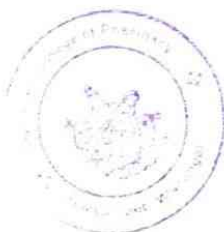


*Sri Anukriti*  
Sri Anukriti College of Pharmacy  
Narsampet-506 33

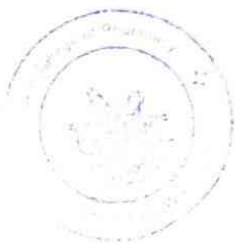
1	Explain the etiopathogenesis of selected diseases
2	Explain the general prescribing guidelines and rational use of drugs
3	Discuss the therapeutic approach in the management of selected diseases and controversies in drug therapy
4	Prepare individualized therapeutic plans based on diagnosis
5	Recognise the role of pharmacist in essential and rational drug use
<b>Pharmacotherapeutics I (Practicals) Course Outcomes</b>	
1	Identify drug interactions and rationalize the prescription
2	Discuss the therapeutic approach to management of selected diseases
3	Prepare individualized therapeutic plans based on diagnosis
4	Perform patient counseling
5	Conduct planned experiments and prepare laboratory report in a standard format
<b>Pharmacology II ( Theory) Course Learning Outcomes</b>	
1	Discuss the pharmacological aspects of drugs acting on blood and renal System
2	Discuss the pharmacological aspects of chemotherapeutic agents used in various diseases
3	Explain the pharmacology of immunosuppressants and principles of animal
4	Illustrate the chromosome structure and DNA replication
5	Recognise the fundamentals and importance of cell biology in cell signaling pathways
6	Analyse the principles and processes of Recombinant DNA technology
<b>Pharmacology II (Practical) Course Learning Outcomes</b>	
1	Demonstrate intraperitoneal and intramuscular routes of administration of drugs in animals and describe different anaesthetics used in laboratory animals
2	Identify and select laboratory appliances used in experimental pharmacology
3	Recommend the physiological salt solution for different isolated tissue preparations
4	Perform a bioassay procedure and create a Dose Response Curve
5	Demonstrate the screening of a drug for CNS activity
6	Conduct planned experiments and prepare laboratory report in a standard format
<b>Pharmaceutical Analysis ( Theory) Course Outcomes</b>	
1	Explain the importance of modern instrumentation in pharmaceutical analysis
2	Describe the fundamental principles and applications of UV-visible, IR, NMR, Mass spectroscopy
3	Describe the fundamental principles and applications of Flame photometry, X-ray diffraction, atomic emission and atomic absorption spectroscopy
4	Interpret various spectra such as IR, NMR and Mass to identify the given compound
5	Identify appropriate instrumentation for the analysis of various compounds
6	Discuss the concepts of total quality management, quality validation methods and quality review

*[Handwritten Signature]*

Principal  
 Jayamukti College of Pharmacy  
 Narsampet-506 332



<b>Pharmaceutical Analysis(Practical) Course Outcomes</b>	
1	Operate and handle instruments such as UV-visible and IR spectrophotometer to obtain the spectra of a given sample
2	Interpret spectra of UV-visible, IR, NMR and Mass to identify the given compound
3	Correlate spectral data with chemical structure
4	Estimate the quantity of a drug in a given mixture or solution
5	Conduct planned experiments and prepare laboratory report in a standard format
<b>Course Outcomes</b>	
<b>III Year Pharm.D Pharmacotherapeutics II ( Theory)</b>	
1	Explain the etiopathogenesis of selected infectious diseases, musculoskeletal and renal disorders
2	Discuss the principles of cancer therapy and dermatological disorders
3	Identify the patient-specific parameters relevant in initiating and monitoring drug therapy and adverse effects
4	Discuss the therapeutic controversies in drug therapy
5	Prepare individualized therapeutic plans based on diagnosis
6	Recognise the role of pharmacist in essential and rational drug use
<b>Pharmacotherapeutics - II(Practical)</b>	
<b>Course Outcomes</b>	
1	Identify drug interactions and rationalize the prescription
2	Discuss the therapeutic approach to management of selected diseases
3	Prepare individualized therapeutic plans based on diagnosis
4	Perform patient counseling
5	Conduct planned experiments and prepare laboratory report in a standard format
<b>Pharmaceutical Jurisprudence( Theory) Course Outcomes</b>	
1	Explain the evolution of pharmacy as a profession in India and emergence of regulatory bodies
2	Discuss the importance of code of pharmaceutical ethics
3	Recognize the provisions of various acts pertaining to drugs and cosmetics
4	Explain the latest amendments with respect to New Drug policy, DPCO and Patent and design act
5	Discuss the concepts of price fixation of pharmaceutical products
6	Outline the concepts of Narcotic and Psychotropic Substances Act, Pharmacy Act and Excise duties Act
<b>Medicinal Chemistry( Theory)</b>	
<b>Course Outcomes</b>	
1	Discuss the relationship between the structures of medicinal compounds with their biological activity
2	Explain the concept of rational drug design including combinatorial chemistry and computer aided drug design
3	Identify the structures of a given medicinal compound and give the nomenclature
4	Synthesise a drug molecule using available synthetic and new path ways
5	Explain the mode of action, mode of resistance, therapeutic uses and side effects of drugs



Principal

Jayantulhi College of Pharmacy  
Narsampet-506 332

	<b>Medicinal Chemistry(Practical)</b>
	<b>Course Outcomes</b>
1	Synthesis compounds of medicinal interest
2	Conduct monograph analysis of the pharmaceutical compounds
3	Determine the amount of drug present in an unknown solution
4	Estimate the purity of drugs by performing assays
5	Determine partition coefficient and dissociation constant of a given compound
6	Conduct planned experiments and prepare laboratory report in a standard format
	<b>Pharmaceutical Formulations( Theory) Course Outcomes</b>
1	Explain the significance of formulation, preparation and evaluation of various pharmaceutical dosage forms
2	Discuss formulation additives for various dosage forms
3	Explain suitable measures for stability of the dosage forms
4	Evaluate different dosage forms with appropriate quality control test for a given drug
5	Recommend suitable packaging material for a dosage form of a given drug
	<b>Pharmaceutical Formulations - Practical</b>
	<b>Course Outcomes</b>
1	Prepare formulations of different dosage forms as per the batch formula
2	Operate different equipments and instruments used in preparation of dosage forms
3	Select suitable packaging container for a dosage form
4	Evaluate different dosage forms by performing quality control tests
5	Prepare and evaluate cosmetics such as lipstick, cold cream and shampoo
6	Conduct planned experiments and prepare laboratory report in a standard format
	<b>IV Year Pharm.D Pharmacotherapeutics -III( Theory)</b>
	<b>Course Outcomes</b>
1	Explain the etiopathogenesis of selected gastrointestinal, haematological, neurological and psychiatric diseases
2	Discuss the principles of evidence based therapy and pain management
4	Discuss the therapeutic approach in the management
5	Prepare individualized therapeutic plans based on diagnosis
6	Recognise the role of pharmacist in essential and rational drug use
	<b>Pharmacotherapeutics III</b>
	<b>Course Outcomes</b>
1	Identify drug interactions and rationalize the
2	Discuss the therapeutic approach to management of selected diseases
3	Prepare individualized therapeutic plans based on diagnosis
4	Conduct patient counseling
5	Conduct planned experiments and prepare laboratory report in a standard format


*[Signature]*  
Principal

Jayamukhi College of Pharmacy  
Narsampet-506 332




	<b>Hospital Pharmacy</b>
	<b>Course Outcomes</b>
1	Discuss the roles and responsibilities of hospital pharmacist, hospital drug policies and guidelines for hospital pharmacy
2	Discuss various drug distribution methods in a hospital pharmacy
3	Apply various methods of inventory control
4	Formulate parenteral preparations
5	Contribute to a newsletter for providing continuous education and awareness
6	Explain about handling and packaging of radiopharmaceuticals
	<b>Hospital Pharmacy</b>
	<b>Course Outcomes</b>
	After studying this course, student will be able to:
1	Analyse prescriptions for drug interaction
2	Formulate and prepare parenteral formulations and powders
3	Perform inventory analysis
4	Answer drug information queries through literature search
5	Conduct planned experiments and prepare laboratory report in a standard format
	<b>Clinical Pharmacy (Theory) Course Outcomes</b>
1	Explain the roles and responsibilities of clinical pharmacist
2	Analyse and interpret the laboratory test results for clinical diagnosis
3	Conduct interview to elicit medication history and perform patient counseling
4	Identify, monitor, assess, manage, prevent, document and report suspected adverse drug reactions
5	Provide drug and poison information through critical analysis
6	Recognise the potential sources of medication errors and act for its prevention
	<b>Clinical Pharmacy(Practical) Course Outcomes</b>
1	Assess prescriptions for drug interaction and answer drug information query
2	Perform patient counseling on medication and conduct medication history interview
3	Analyse and interpret the data obtained through laboratory tests
4	Conduct planned experiments and prepare laboratory report in a standard format
5	4. Discuss biopharmaceutics, pharmacokinetics, pharmacodynamics with their applications
	<b>Biostatistics and research methodology(Theory)</b>
	<b>Course Outcomes</b>
1	Recognise the importance of biostatistics in pharmacy
2	Explain the importance of research methods in the design of pharmacoepidemiological study
3	Discuss the methods of collection of data and its analysis and interpretation
4	Identify appropriate statistical methods for data analysis



  
 Principal  
 Jayamukhi College of Pharmacy  
 Narsampet-506 332



5	Discuss and evaluate various software for statistical analysis of data
6	Explain the various methods of testing hypothesis
<b>Biopharmaceutics and Pharmacokinetics(Theory) Course Outcomes</b>	
1	Discuss biopharmaceutics, pharmacokinetics, pharmacodynamics with their applications
2	Explain the mechanisms and factors affecting ADME processes
3	Discuss the significance of pharmacokinetics in the design and evaluation of dosage forms
4	Differentiate between bioavailability and bioequivalence along with their measurement
5	Identify and select the right pharmacokinetic model for drugs administered by different routes
<b>1 Biopharmaceutics and Pharmacokinetics(Practical) Course Outcomes</b>	
1	Compare the <i>in-vitro</i> drug release profile of different marketed products
2	Perform the solubility enhancement techniques for improvement of drug release of poorly water soluble drugs
3	Estimate the bioavailability (absolute and relative) and bioequivalence from the given clinical data
4	Calculate the drug content in blood sample using Area Under Curve approach
5	Calculate and interpret various pharmacokinetic parameters from the given clinical data
6	Conduct planned experiments and prepare laboratory report in a standard format
<b>Clinical Toxicology(Theory)</b>	
<b>Course Outcomes</b>	
1	Describe the mechanism of action of common poisons and antidotes
2	Describe the mechanism of action of common poisons and antidotes
3	Detect and differentiate acute and chronic poisoning by clinical symptoms
4	Select appropriate laboratory tests to identify and determine the severity of poisoning
5	Detect signs and symptoms of drug abuse and suggest suitable remedial measures
6	Recommend the standard procedures to deal with cases of poisoning
<b>V Year Pharm.D</b>	
<b>Clinical Research (Theory)</b>	
<b>Course Outcomes</b>	
1	Discuss the Pharmacological and Toxicological considerations in process of development of new drugs
2	Discuss the principles and phases in clinical trial of drug
3	Explain the guidelines for ethics and safe monitoring in clinical trial of a drug
4	Design the documents of clinical trial
5	Distinguish the guidelines of national and international regulatory bodies for clinical trial
6	Recognise differing roles and obligations of the Investigator, Sponsor and Institutional Review Board
<b>Pharmacoepidemiology and Pharmacoeconomics(Theory) Course Outcomes</b>	
1	Discuss the scope, need, origin and evaluation of Pharmacoepidemiology
2	Explain the importance of Measurement of outcomes in Pharmacoepidemiology
3	Recommend suitable method for measuring the outcome of Pharmacoepidemiology for a disease

  
 Principal  
 Narsimha College of Pharmacy  
 Narsampet-506 332



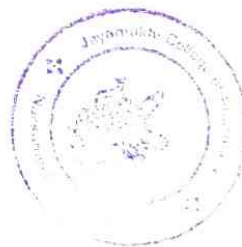
4	Suggest an appropriate Pharmacoepidemiological method for a given drug and address the risks associated with Pharmacoepidemiological study
5	Discuss the basic principles, role and relevance of Pharmacoeconomics in the development of a new drug
6	Identify and justify an appropriate evaluation method for Pharmacoeconomics study of a disease
<b>Clinical Pharmacokinetics and Pharmacotherapeutic Drug Monitoring</b>	
<b>Course Outcomes</b>	
1	Discuss the pharmacokinetic principles to individualize drug therapy in patient care situations
2	Determine dose, dosing intervals and dosage adjustments of a drug for a given patient
3	Apply the principles of pharmacokinetics to analyse and predict drug interactions
4	Prepare protocol for TDM of drugs for selected diseases
5	Discuss the concept of genetic polymorphism in metabolism, transport and target of a drug
<b>CLERKSHIP</b>	
<b>Course Outcomes</b>	
1	Discuss the role of Pharmacist in clinical pharmacy services
2	Demonstrate the skills of a clinical Pharmacist
3	Discuss the available therapeutic options in the management of diseases
4	Prepare a pharmaceutical care plan for a given case
5	Detect, Interpret and report medication errors and drug interactions
<b>PROJECT WORK</b>	
<b>Course Outcomes</b>	
1	Address a problem related to Pharmacy practice in hospital, community service or clinical set up with a wider perspective and generality
2	Define the problem to be addressed and translate it into a statement of aim, objectives, scope and plan for the project
3	Carry out and report an information survey and take account of findings in executing project
4	Evaluate, select and apply relevant theories and techniques from the full range of courses studied using conceptual models and frameworks to enhance depth of understanding
5	Select appropriate methodology for investigative work, taking into account the pros and cons of the alternatives available and develop solution proposals based on reasoned judgement
6	Present a coherent, logically argued, fully referenced report and engage in a professional manner in a viva-voce discussion about the project



*[Handwritten signature]*

Principal  
Jayamukhi College of Pharmacy  
Narsampet-506 332

<b>VI Year Pharm.D INTERNSHIP</b>	
<b>Course Outcomes</b>	
1	Explain the pathophysiology of disease states and the rationale for drug therapy
2	Discuss the available therapeutic options to provide patient care in co-operation with patients, prescribers, and other members of an interprofessional health care team
3	Identify, manage and use resources of the health care system, in cooperation with patients, prescribers, other health care providers
4	Analyse the therapeutic approaches to promote health improvement, wellness, and disease prevention
5	Demonstrate skills in monitoring of the National Health Programmes and schemes
6	Develop leadership qualities to function effectively as a member of the health care team
7	Communicate effectively with patients and the community



  
**Principal**  
 Jayamukhi College of Pharmacy  
 Narsampet-506 332