



ANAND PHARMACY COLLEGE, ANAND
(An Autonomous College under UGC Regulations 2023)

Managed by Shri Ramkrishna Seva Mandal

(Approved by PCI, NAAC Accredited – A+ Grade, 3.38 CGPA)

Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D (PB)**

Year: **1st year**

Course Code: **P090101TP**

Course Name: **Pharmacotherapeutics-III**

Course Type: **Core**

Year of Implementation: **2025 – 26**

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)						Total Marks
							Sessional Exams				End Semester Assessment		
							Theory	Practical					
L	Tu	P	L	Tu	P	T	CIE	E	T	T	P		
3	1	3	6	2	3	11	30	10	20	30	70	70	200

Scope:

This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Understand the epidemiology & etiology of selected diseases
CO2	Understand the pathophysiology of selected diseases
CO3	Summarize the clinical presentations of the various diseases
CO4	Plan and optimize individualized therapeutic approach based on diagnosis
CO5	Participate in ward round and conduct patient medication history interview and patient counselling
CO6	Perform critical analysis of the case to identify drug related problem and suggest remedies of it

Course Contents:

Total Teaching hours: 90 hours

Unit 1	Gastrointestinal system: Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Liver disorders - Alcoholic liver disease, Viral hepatitis including jaundice, and Drug induced liver disorders.	25 hours
Unit 2	Haematological system: Anaemias, Venous thromboembolism, Drug induced blood disorders.	15 hours
Unit 3	Nervous system: Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,	10 hours
Unit 4	Psychiatry disorders: Schizophrenia, Affective disorders, anxiety disorders, sleep disorders, obsessive compulsive disorders	20 hours
Unit 5	Pain management including Pain pathways, neuralgias, headaches	10 hours
Unit 6	Evidence Based Medicine	10 hours

Practicals:



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Hospital postings for a period of at least 50 hours is required to understand the principles and practice involved in ward round participation and clinical discussion on selection of drug therapy. Students are required to maintain a record of 15 cases observed in the ward and the same should be submitted at the end of the course for evaluation. Each student should present at least two medical cases they have observed and followed in the wards.

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases:

Title of the topic

- 1 Gastrointestinal system: Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Liver disorders - Alcoholic liver disease, Viral hepatitis including jaundice, and
- 2 Drug induced liver disorders.
- 2 Haematological system: Anaemias, Venous thromboembolism, Drug induced blood disorders.
- 3 Nervous system: Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,
- 4 Psychiatry disorders: Schizophrenia, Affective disorders, anxiety disorders, sleep disorders,
3. Obsessive Compulsive disorders
- 5 Pain management including Pain pathways, neuralgias, headaches.
- 6 Evidence Based Medicine

Assignments: Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

Format of the assignment:

1. Minimum & Maximum number of pages
2. Reference(s) shall be included at the end.
3. Assignment can be a combined presentation at the end of the academic year
4. It shall be computer draft copy
5. Name and signature of the student
6. Time allocated for presentation may be 8+2 Min.

Scheme of Practical Examination

Item	Internal/Sessional	External
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max. marks	20	70
Duration	3 hours	4 hours

Recommended Books^: (Latest Editions)

1. Roger and Walker. Clinical Pharmacy and Therapeutics. Churchill Livingstone publication, New York.
2. Joseph T. Dipiro et al. Pharmacotherapy: A Pathophysiologic Approach. Appleton & Lange, New York.
3. Robins SL. Pathologic Basis of Disease. W.B. Saunders publication, New York.
4. Green and Harris. Pathology and Therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice. Chapman and Hall publication, New York.
5. Eric T. Herfindal. Clinical Pharmacy and Therapeutics. Williams and Wilkins publication, New York.

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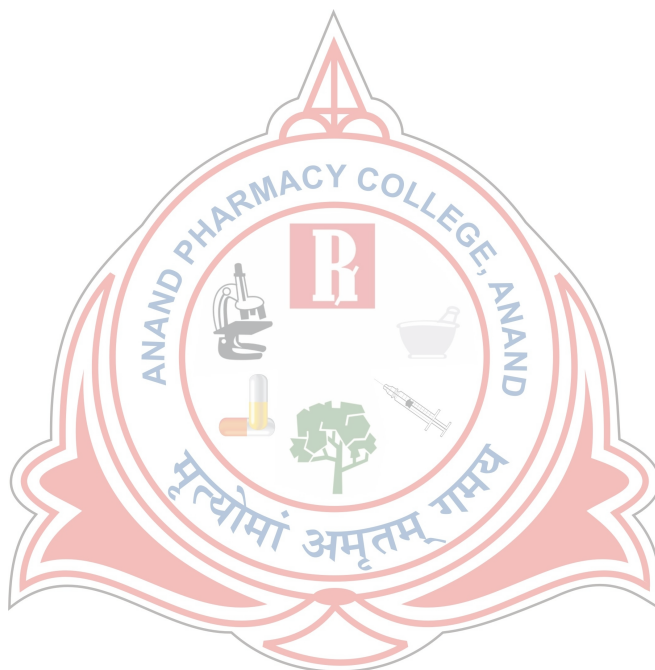
6. Lloyd Young and Koda-Kimble MA. Applied Therapeutics: The Clinical Use of Drugs. New York.
7. Avery's Drug Treatment. Adis International Limited, New York.
8. Relevant review articles from recent medical and pharmaceutical literature.

L= Lecture, Tu= Tutorial, P= Practical, T = Theory

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D (PB)**

Year: **1st Year**

Course Code: **P090102TP**

Course Name: **Hospital Pharmacy**

Course Type: **Core**

Year of Implementation: **2025 – 26**

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)						Total Marks
							Sessional Exams				End Semester Assessment		
							Theory		Practical				
L	Tu	P	L	Tu	P		T	CIE	E	T	T	P	
2	1	3	4	2	3	9	30	10	20	30	70	70	200

Scope:

In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug dispensing, manufacturing of parenteral preparations, drug information, patient counselling, and therapeutic drug monitoring for improved patient care

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Understand the organization and roles of hospital and hospital pharmacy
CO2	Recognize the essential practices for effective hospital pharmacy operations
CO3	Implement inventory control and understand management of hospital pharmacy service
CO4	Apply professional development and manufacturing of pharmaceuticals in context of hospital pharmacy
CO5	Recall the hospital and hospital pharmacy related practices and skills
CO6	Provide professional hospital pharmacy services to the health care professionals & patients

Course Contents:

Total Teaching hours: 60 hours

Unit 1	Hospital - its Organisation and functions	3 hours
Unit 2	Hospital pharmacy-Organisation and management a) Organizational structure-Staff, Infrastructure & work load statistics b) Management of materials and finance c) Roles & responsibilities of hospital pharmacist	7 hours
Unit 3	The Budget – Preparation and implementation	4 hours
Unit 4	Hospital drug policy a) Pharmacy and Therapeutic committee (PTC) b) Hospital formulary c) Hospital committees - Infection committee - Research and ethical committee d) developing therapeutic guidelines e) Hospital pharmacy communication – Newsletter	10 hours

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Unit 5	Hospital pharmacy services a) Procurement & warehousing of drugs and Pharmaceuticals b) Inventory control Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time, safety stock c) Drug distribution in the hospital i) Individual prescription method ii) Floor stock method iii) Unit dose drug distribution method d) Distribution of Narcotic and other controlled substances e) Central sterile supply services – Role of pharmacist	15 hours
Unit 6	Manufacture of Pharmaceutical preparations a) Sterile formulations – large and small volume parenterals b) Manufacture of Ointments, Liquids, and creams c) Manufacturing of Tablets, granules, capsules, and powders d) Total parenteral nutrition	10 hours
Unit 7	Continuing professional development programs Education and training	4 hours
Unit 8	Radio Pharmaceuticals – Handling and packaging	4 hours
Unit 9	Professional Relations and practices of hospital pharmacist	3 hours

Practicals:

1. Assessment of drug interactions in the given prescriptions
2. Manufacture of parenteral formulations, powders.
3. Drug information queries.
4. Inventory control.

List of Assignments:

1. Design and Management of Hospital pharmacy department for a 300 bedded hospital.
2. Pharmacy and Therapeutics committee – Organization, functions, and limitations.
3. Development of a hospital formulary for 300 bedded teaching hospital
4. Preparation of ABC analysis of drugs sold in one month from the pharmacy.
5. Different phases of clinical trials with elements to be evaluated.
6. Various sources of drug information and systematic approach to provide unbiased drug information.
7. Evaluation of prescriptions generated in hospital for drug interactions and find out the suitable management.

Special requirements:

1. Each college should sign MoU with nearby local hospital having minimum 300 beds for providing necessary training to the students on hospital pharmacy activities.
2. Well, equipped with various resources of drug information.

Scheme of Practical Examination

Item	Internal/ Sessional	External
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max. marks	20	70
Duration	3 hours	4 hours

Recommended Books^: (Latest Editions)

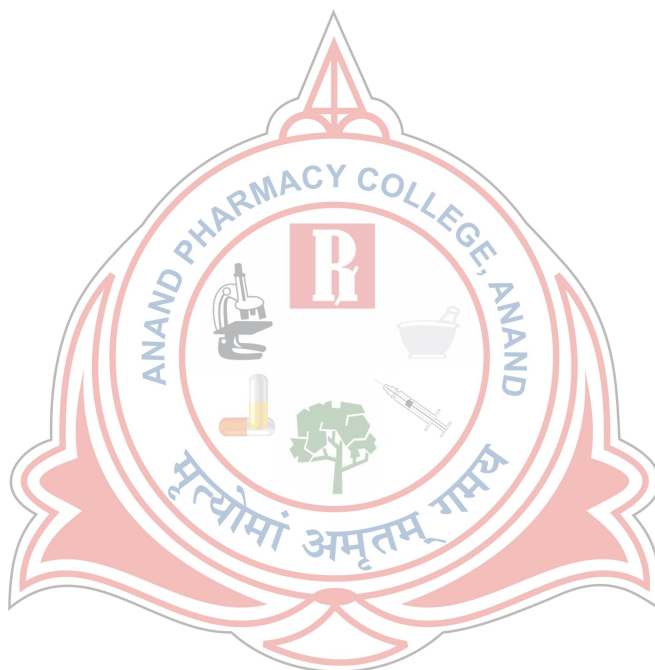
1. William Hassan E. Hospital Pharmacy. John Wiley & Sons, New York.
2. Merchant SH, Qadry JS. Revised by Goyal RK, Parikh RK. A Textbook of Hospital Pharmacy. John Wiley & Sons, New York.
3. World Health Organization. WHO Consultative Group Report. John Wiley & Sons, New York.
4. R.P.S. Vol. 2, Part B; Pharmacy Practice Section. John Wiley & Sons, New York.
5. Harman Robin J. Handbook of Pharmacy – Health Care. The Pharmaceutical Press, New York.

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D (PB)**

Year: **1st Year**

Course Code: **P090103TP**

Course Name: **Clinical Pharmacy**

Course Type: **Core**

Year of Implementation: **2025 – 26**

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)						Total Marks
							Sessional Exams				End Semester Assessment		
							Theory		Practical				
L	Tu	P	L	Tu	P		T	CIE	E	T	T	P	
3	1	3	6	2	3	11	30	10	20	30	70	70	200

Scope:

The course is designed to provide necessary knowledge and skills to students that enable them to practice patient care that optimizes the use of medication and promotes health, wellness, and disease prevention

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Assess drug therapy through medication chart review and provide drug information
CO2	Perform medication history interview and counselling of the patients
CO3	Identify and resolve drug related problems
CO4	Detect, assess, and report adverse drug reaction to mitigate the medication risk
CO5	Interpret laboratory results of specific diseases for optimized clinical services
CO6	Recall the principle services of clinical pharmacy viz a viz drug therapy monitoring, ward round participation, ADR management, Drug and poison information, DUE

Course Contents:

Total Teaching hours: 90 hours

1	Definitions, development and scope of clinical pharmacy	3 hours
2	Introduction to daily activities of a clinical pharmacist a. Drug therapy monitoring (medication chart review, clinical review, pharmacist interventions) b. Ward round participation c. Adverse drug reaction management d. Drug information and poisons information e. Medication history f. Patient counseling g. Drug utilisation evaluation (DUE) and review (DUR) h. Quality assurance of clinical pharmacy services	15 hours
3	Patient data analysis The patient's case history, its structure and use in evaluation of drug therapy & Understanding common medical abbreviations and terminologies used in clinical practices.	12 hours
4	Clinical laboratory tests used in the evaluation of disease states, and interpretation of test results a. Haematological, Liver function, Renal function, thyroid function	12 hours

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	tests b. Tests associated with cardiac disorders c. Fluid and electrolyte balance d. Microbiological culture sensitivity tests e. Pulmonary Function Tests	
5	Drug & Poison information a. Introduction to drug information resources available b. Systematic approach in answering DI queries c. Critical evaluation of drug information and literature d. Preparation of written and verbal reports e. Establishing a Drug Information Centre f. Poisons information- organization & information resources	12 hours
6	Pharmacovigilance a. Scope, definition and aims of pharmacovigilance b. Adverse drug reactions - Classification, mechanism, predisposing factors, causality assessment [different scales used] c. Reporting, evaluation, monitoring, preventing & management of ADRs d. Role of pharmacist in management of ADR	12 hours
7	Communication skills, including patient counselling techniques, medication history interview, presentation of cases	10 hours
8	Pharmaceutical care concepts	5 hours
9	Critical evaluation of biomedical literature	5 hours
10	Medication errors	4 hours

Practicals:

Students are expected to perform 15 practicals in the following areas covering the topics dealt in theory class.

- Answering drug information questions (4 Nos)
- Patient medication counselling (4 Nos)
- Case studies related to laboratory investigations (4 Nos)
- Patient medication history interview (3 Nos)

Assignments:

Students are expected to submit THREE written assignments (1500 – 2000 words) on the topics given to them covering the following areas dealt in theory class. Drug information, Patient medication history interview, Patient medication counselling, Critical appraisal of recently published articles in the biomedical literature which deals with a drug or therapeutic issue.

Format of the assignment:

- Minimum & Maximum number of pages.
- Reference(s) shall be included at the end.
- Assignment can be a combined presentation at the end of the academic year.
- It shall be computer draft copy.
- Name and signature of the student.
- Time allocated for presentation may be 8+2 Min

Scheme of Practical Examination

Item	Internal/ Sessional	External
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max. marks	20	70
Duration	3 hours	4 hours

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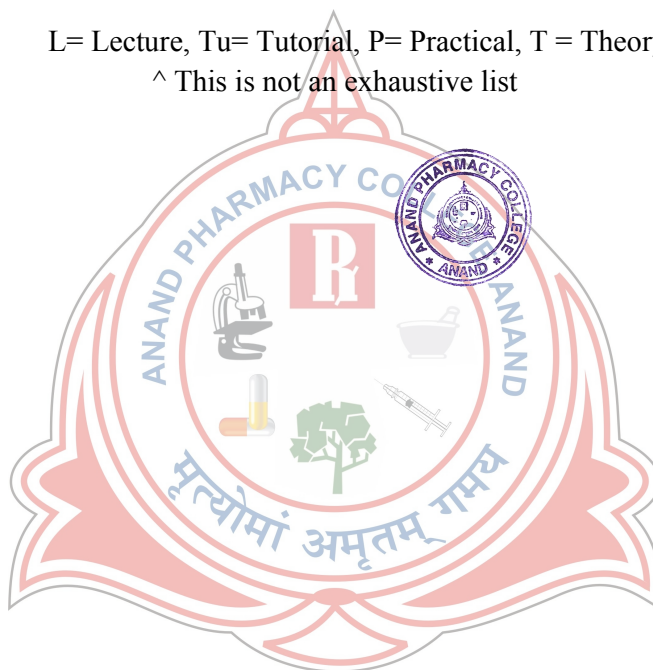
Note: Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

Recommended Books^: (Latest Editions)

1. Silverstein Robert M, Bassler Clayton G. Spectrometric Identification of Organic Compounds. John Wiley & Sons, New York.
2. Practice Standards and Definitions. The Society of Hospital Pharmacists of Australia.
3. Scott Larry T. Basic Skills in Interpreting Laboratory Data. American Society of Health-System Pharmacists Inc.
4. Shargel Leon. Biopharmaceutics and Applied Pharmacokinetics. Prentice Hall Publications.
5. Parthasarathi G, et al. A Textbook of Clinical Pharmacy Practice: Essential Concepts and Skills. Orient Langram Pvt. Ltd.
6. Australian Drug Information: Procedure Manual. The Society of Hospital Pharmacists of Australia.
7. Rowland Malcolm, Tozer Thomas N. Clinical Pharmacokinetics. Williams and Wilkins Publication.
8. Bolton Sanford. Pharmaceutical Statistics: Practical and Clinical Applications. Marcel Dekker, Inc.

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 Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D (PB)**

Year: **1st Year**

Course Code: **P090104TT**

Course Name: **Clinical Toxicology**

Course Type: **Core**

Year of Implementation: **2025 – 26**

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)						Total Marks	
							Sessional Exams				End Semester Assessment			
							Theory	Practical						
L	Tu	P	L	Tu	P		T	CIE	E	T	T	P		
2	1	-	4	2	-	6	30	-	-	-	70	-	100	

Scope:

The course is designed to give students a background in the medical and toxicological principles of toxicants commonly encountered in poison control centers and emergency departments. The course enables the student to lend support in poison control centers, hospitals and emergency departments.

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Understand basic principles of toxicology and toxicokinetics
CO2	Apply general approaches for the management of acute poisoning
CO3	Recognize clinical symptoms & management of chronic poisoning
CO4	Present clinical symptoms and management of snake bite, substance abuse, food and plant poisoning

Course Contents:

Total Teaching hours: 60 hours

Unit 1	General principles involved in the management of poisoning	3 hours
Unit 2	Antidotes and the clinical applications	3 hours
Unit 3	Supportive care in clinical Toxicology	4 hours
Unit 4	Gut Decontamination.	3 hours
Unit 5	Elimination Enhancement	3 hours
Unit 6	Toxicokinetics	7 hours
Unit 7	Clinical symptoms and management of acute poisoning with the following agents – a) Pesticide poisoning: organophosphorous compounds, carbamates, organochlorines, pyrethroids. b) Opiates overdose. c) Antidepressants d) Barbiturates and benzodiazepines. e) Alcohol: ethanol, methanol. f) Paracetamol and salicylates. g) Non-steroidal anti-inflammatory drugs. h) Hydrocarbons: Petroleum products and PEG. i) Caustics: inorganic acids and alkali. j) Radiation poisoning	10 hours

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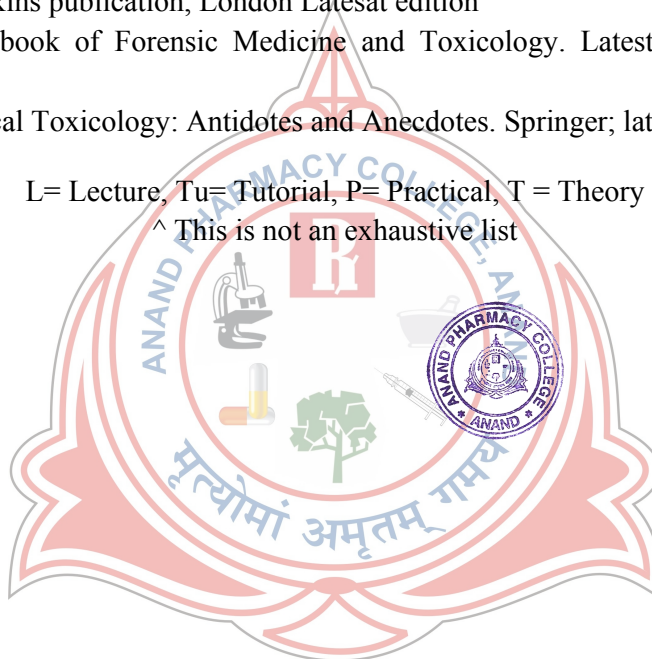
Unit 8	Clinical symptoms and management of chronic poisoning with the following agents – Heavy metals: Arsenic, lead, mercury, iron, copper	5 hours
Unit 9	Venomous snake bites: Families of venomous snakes, clinical effects of venoms, general management as first aid, early manifestations, complications and snake bite injuries.	5 hours
Unit 10	Plants poisoning. Mushrooms, Mycotoxins	3 hours
Unit 11	Food poisonings	3 hours
Unit 12	Envenomations – Arthropod bites and stings.	3 hours
Unit 13	Substance abuse: Signs and symptoms of substance abuse and treatment of dependence a) CNS stimulants: amphetamine b) Opioids c) CNS depressants d) Hallucinogens: LSD e) Cannabis group f) Tobacco	8 hours

Recommended Books^: (Latest Editions)

1. Matthew J Ellenhorn. Ellenhorns Medical Toxicology – Diagnosis and treatment of poisoning. Williams and Willkins publication, London Latesat edition
2. V V Pillay. Handbook of Forensic Medicine and Toxicology. Latest edition Paras Publication, Hyderabad
3. Marcus SM. Medical Toxicology: Antidotes and Anecdotes. Springer; latest edition.

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D (PB)**

Year: **1st Year**

Course Code: **P090105TP**

Course Name: **Biopharmaceutics & Pharmacokinetics**

Course Type: **Core**

Year of Implementation: **2025 – 26**

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)						Total Marks
							Sessional Exams				End Semester Assessment		
							Theory	Practical					
L	Tu	P	L	Tu	P		T	CIE	E	T	T	P	
3	1	3	6	2	3	11	30	10	20	30	70	70	200

Scope:

The course will provide students with necessary information related to different factors affecting the performance of various drug dosage forms in vitro and in vivo, deliver specialized knowledge that is essential to understand the concept of bioavailability and bioequivalence and explore the kinetics of the drug in human body in relation to the in vivo performance and determination of drug dose and regimen for therapy individualization

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Understand and implement the factors affecting drug absorption, distribution, metabolism and elimination to formulate a pharmaceutical product
CO2	Demonstrate the understanding and application of compartmental pharmacokinetic in designing a dosage form
CO3	Apply the principles of non-compartmental pharmacokinetic in dosage form design
CO4	Apply the concept of bioavailability and bioequivalence to develop innovator and generic product
CO5	Recall the concept of biopharmaceutics and pharmacokinetic
CO6	Perform the experiments and calculation related to biopharmaceutics and pharmacokinetic

Course Contents:

Total Teaching hours: 90 hours

Unit 1	Biopharmaceutics: Introduction to Biopharmaceutics a. Absorption of drugs from gastrointestinal tract. b. Drug Distribution. c. Drug Elimination.	7 hours
Unit 2	Pharmacokinetics: Introduction to Pharmacokinetics. a. Mathematical model b. Drug levels in blood. c. Pharmacokinetic model d. Compartment models e. Pharmacokinetic study.	8 hours
Unit 3	One compartment open model. a. Intravenous Injection (Bolus) b. Intravenous infusion.	5 hours

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Unit 4	Multicompartment models. a. Two compartment open model. b. IV bolus, IV infusion and oral administration	10 hours
Unit 5	Multiple – Dosage Regimens. a. Repetitive Intravenous injections – One Compartment Open Model b. Repetitive Extravascular dosing – One Compartment Open model c. Multiple Dose Regimen – Two Compartment Open Model	15 hours
Unit 6	Nonlinear Pharmacokinetics. a. Introduction b. Factors causing non-linearity. c. Michaelis-menton method of estimating parameters	15 hours
Unit 7	Noncompartmental Pharmacokinetics. a. Statistical Moment Theory. b. MRT for various compartment models. c. Physiological Pharmacokinetic model.	15 hours
Unit 8	Bioavailability and Bioequivalence. a. Introduction. b. Bioavailability study protocol. c. Methods of Assessment of Bioavailability	15 hours

Practicals:

1. Improvement of dissolution characteristics of slightly soluble drugs by some methods.
2. Comparison of dissolution studies of two different marketed products of same drug.
3. Influence of polymorphism on solubility and dissolution.
4. Protein binding studies of a highly protein drug and poorly protein bound drug.
5. Extent of plasma-protein binding studies on the same drug (i.e. highly and poorly protein bound drug) at different concentrations in respect of constant time.
6. Bioavailability studies of some commonly used drugs on animal/human model.
7. Calculation of K_a , K_e , $t_{1/2}$, C_{max} , AUC, AUMC, MRT etc. from blood profile data.
8. Calculation of bioavailability from urinary excretion data for two drugs.
9. Calculation of AUC and bioequivalence from the given data for two drugs.
10. In vitro absorption studies.
11. Bioequivalency studies on the different drugs marketed (eg) Tetracycline, Sulphamethoxazole, Trimethoprim, Aspirin etc., on animals and human volunteers.
12. Absorption studies in animal inverted intestine using various drugs.
13. Effect on contact time on the plasma protein binding of drugs.
14. Studying metabolic pathways for different drugs based on elimination kinetics data.
15. Calculation of elimination half-life for different drugs by using urinary elimination data and blood level data.
16. Determination of renal clearance.

Scheme of Practical Examination

Item	Internal/Sessional	External
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max. marks	20	70
Duration	3 hours	4 hours

Note: Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

Recommended Books^: (Latest Editions)

1. Milo Gibaldi, Biopharmaceutics and Clinical Pharmacokinetics
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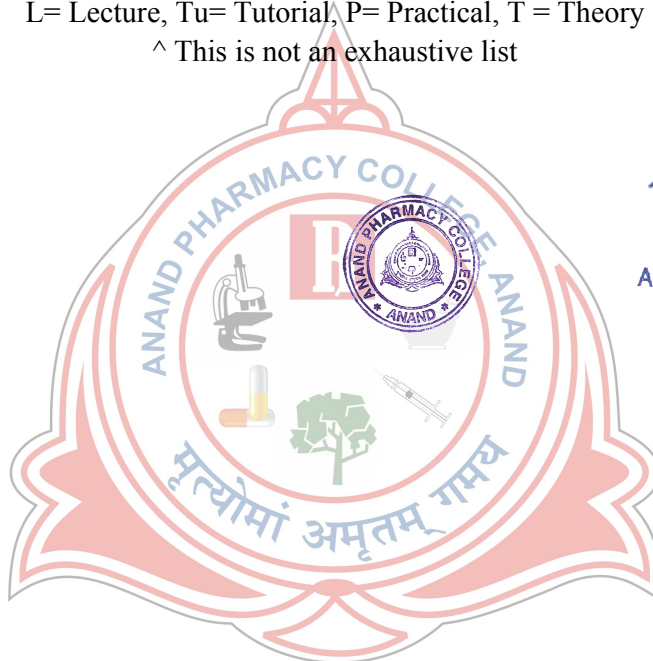


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2. Remington's Pharmaceutical Sciences, Mack Publishing Company, Pennsylvania.
3. Milo Gibaldi Donald, Pharmacokinetics: R. Merce Dekker Inc.
4. Milo Gibaldi and Laurie Prescott, Hand Book of Clinical Pharmacokinetics, by ADIS Health Science Press.
5. Robert F Notari, Biopharmaceutics and Pharmacokinetics.
6. D. M. Brahmanekar and Sunil B. Jaiswal, Biopharmaceutics; Swarbrick g. Bio pharmaceutics and Pharmacokinetics-A Treatise, Vallabh Prakashan Pitampura, Delhi
7. Malcolm Rowland and Thomas, N. Tozen, Lea and Febrger, Clinical Pharmacokinetics, Concepts and Applications: By Philadelphia
8. Abdou H.M, Dissolution, Bioavailability and Bioequivalence, By Mack, Publishing Company, Pennsylvania
9. Robert F Notari Marcel Dekker Inc Biopharmaceutics and Clinical Pharmacokinetics-An introduction Revised and expanded, New York and Basel.
10. James Swarbrick, James, C. Roylan, Encyclopedia of Pharmaceutical Technology, Vol 13, Marcel Dekker Inc, New York latest edition

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D (PB)**

Year: **1st Year**

Course Code: **P090106TT**

Course Name: **Biostatistics and Research Methodology**

Course Type: **Core**

Year of Implementation: **2025 – 26**

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)						Total Marks
							Sessional Exams				End Semester Assessment		
							Theory		Practical				
L	Tu	P	L	Tu	P		T	CIE	E	T	T	P	
2	1	0	4	2	0	6	30	-	-	-	70	-	100

Scope:

The course is a comprehensive concepts-centric primer for the students to make them ready to conduct clinical and community-based research projects. The focus is on designing, executing, documenting and publishing the project,

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Understand the principles of research methodology in relation to health research.
CO2	Apply fundamentals of biostatistics in data analysis with graphical interpretation.
CO3	Evaluate hypothesis testing to conclude research data.
CO4	Utilize the importance of computer system in hospital and community pharmacy.

Course Contents:

Total Teaching hours: 60 hours

1	Research Methodology a. Types of clinical study designs: Case studies, observational studies, interventional studies, b. Designing the methodology c. Sample size determination and Power of a study Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study d. Report writing and presentation of data	10 hours
2	Biostatistics: a. Introduction b. Types of data distribution c. Measures describing the central tendency distributions- average, median, mode d. Measurement of the spread of data range, variation of mean, standard deviation, variance, coefficient of variation, standard error of mean	5 hours

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3	Data graphics Construction and labeling of graphs, histogram, piecharts, scatter plots, semilogarithmic plots	5 hours
4	Basics of testing hypothesis: a. Null hypothesis, level of significance, power of test, P value, statistical estimation of confidence intervals. b. Level of significance (Parametric data)- students t test (paired and unpaired), chi Square test, Analysis of Variance (one-way and two-way) c. Level of significance (Non-parametric data)- Sign test, Wilcoxon's signed rank test, Wilcoxon rank sum test, Mann Whitney U test, Kruskal-Wallis test (one way ANOVA) d. Linear regression and correlation- Introduction, Pearson's and Spearman's correlation and correlation co-efficient. e. Introduction to statistical software: SPSS, Epi Info, SAS	15 hours
5	Statistical methods in epidemiology Incidence and prevalence, relative risk, attributable risk	7 hours
6	Computer applications in pharmacy Computer System in Hospital Pharmacy: Patterns of Computer use in Hospital Pharmacy – Patient record database management, Medication order entry – Drug labels and list – Intravenous solution and admixture, patient medication profiles, Inventory control, Management report & Statistics. Computer In Community Pharmacy Computerizing the Prescription Dispensing process Use of Computers for Pharmaceutical Care in community pharmacy Accounting and General ledger system Drug Information Retrieval & Storage: Introduction – Advantages of Computerized Literature Retrieval Use of Computerized Retrieval	18 hours

Recommended Books^: (Latest Editions)

1. Sanford Bolton Pharmaceutical statistics- practical and clinical applications, publisher Marcel Dekker Inc. New York
2. Patrick M Malone, Karen L Kier, John E Stanovich, Drug Information- A Guide for Pharmacists, McGraw Hill Publications
3. Khanal AB. Mahajan's methods in biostatistics for medical students and research workers. Jaypee Brothers, latest edition

L= Lecture, Tu= Tutorial, P= Practical, T = Theory

^ This is not an exhaustive list



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ANAND PHARMACY COLLEGE, ANAND
(An Autonomous College under UGC Regulations 2023)

Managed by Shri Ramkrishna Seva Mandal

(Approved by PCI, NAAC Accredited – A+ Grade, 3.38 CGPA)

Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **Pharm D (PB)**

Year: **1st Year**

Course Code: **P090107TP**

Course Name: **Pharmacotherapeutics I & II**

Course Type: **Core**

Year of Implementation: **2025 – 26**

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)						Total Marks
							Sessional Exams				End Semester Assessment		
							Theory		Practical				
							L	Tu	P	L	Tu	P	
3	-	3	6	-	3	9	30	10	20	30	70	70	200

Scope:

This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Understand the epidemiology & etiology of selected diseases.
CO2	Understand the pathophysiology of selected diseases.
CO3	Summarize the clinical presentations of the various diseases.
CO4	Plan and optimize individualized therapeutic approach based on diagnosis.
CO5	Participate in ward round and conduct patient medication history interview and patient counselling.
CO6	Perform critical analysis of the case to identify drug related problem and suggest remedies of it.

Course Contents:

Total Teaching hours: 90 hours

Unit 1	Cardiovascular system: Hypertension, Congestive cardiac failure, Angina Pectoris, Myocardial infarction, Hyperlipidaemias, Electrophysiology of heart and Arrhythmias	13 Hours
Unit 2	Respiratory system: Introduction to Pulmonary function test, Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases	6 Hours
Unit 3	Endocrine system: Diabetes, Thyroid diseases, Oral contraceptives, Hormone replacement therapy, Osteoporosis	8 Hours
Unit 4	General prescribing guide lines for a. Paediatric patients b. Geriatric patients c. Pregnancy and breast feeding	4 Hours
Unit 5	Ophthalmology: Glaucoma, Conjunctivitis-viral & bacterial	3 Hours
Unit 6	Introduction to rational drug use Definition, Role of pharmacist Essential drug concept Rational drug formulations	2 Hours

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Unit 7	Infectious disease: Guidelines for the rational use of antibiotics and surgical Prophylaxis, Tuberculosis, Meningitis, Respiratory tract infections, Gastroenteritis, Endocarditis, Septicemia, Urinary tract infections, Protozoal infection-Malaria, HIV & Opportunistic infections, Fungal infections, Viral infections, Gonorrhoea and Syphilis	18 Hours
Unit 8	Musculoskeletal disorders Rheumatoid arthritis, Osteoarthritis, Gout, Spondylitis, Systemic lupus erythematosus.	6 Hours
Unit 9	Renal system Acute Renal Failure, Chronic Renal Failure, Renal Dialysis, Drug induced renal disorders	6 Hours
Unit 10	Oncology: Basic principles of Cancer therapy, General introduction to cancer chemotherapeutic agents, Chemotherapy of breast cancer, leukemia. Management of chemotherapy nausea and emesis	6 Hours
Unit 11	Dermatology: Psoriasis, Scabies, Eczema, Impetigo	4 Hours

Practicals:

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge. Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation. A minimum of 20 cases should be presented and recorded covering most common diseases.

Assignments:

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 –2000 words] should be submitted for evaluation

Scheme of Practical Examination

Item	Internal/ Sessional	External
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max. marks	20	70
Duration	3 hours	4 hours

Note: Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

Recommended Books^: (Latest Editions)

1. Roger and Walker, Clinical Pharmacy and Therapeutics - Publication: Churchill Livingstone.
2. Joseph T. Dipiro, Pharmacotherapy: A Pathophysiologic approach - et al. Publication: Appleton & Lange.
3. Robins SL, Pathologic basis of disease - W.B. Saunders publication.
4. Green and Harris, Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Chapman and Hall publication.
5. Eric T. Herfindal, Clinical Pharmacy and Therapeutics - Williams and Wilkins Publication.



6. Lloyd Young and Koda-Kimble MA, Applied Therapeutics: The clinical Use of Drugs.
7. Avery's Drug Treatment, 1997, Adis International Limited.
8. Relevant review articles from recent medical and pharmaceutical literature.

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