



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: **B. Pharm**

Semester: **V**

Course Code: **B010501TP**

Course Name: **PHARMACEUTICAL MICROBIOLOGY**

Course Type: **Core**

Year of Implementation: **2026–27 (Effective from batch 2024-25)**

Teaching and Examination Scheme:

Number of hours/Week			Number of Credits			Total credits	Evaluation Scheme (Marks)								Total Marks
							Sessional Exams						Term End Assessment		
L	Tu	P	L	Tu	P	6	Theory			Practical			Assessment		
							CIE	E	T	CIE	E	T	T	P	
3	1	4	3	1	2	6	10	15	25	5	20	25	75	75	100

Course Outcomes (CO):

Upon completion of the course, student shall be able to


CO1	Understand the basic concept of microbiology and microorganism.
CO2	Analyze the importance of disinfection and sterilization in pharmaceutical industry.
CO3	Demonstrate the importance of immunity and apply the knowledge of microbiological assay of antibiotics and vitamins in pharmaceutical field.
CO4	Recognize the fundamentals of infectious disease and its diagnosis.
CO5	Recall principles and techniques of experimental microbiology.
CO6	Perform experiments related to cultivation, isolation, identification of microbes, its sterilization and sterility testing and antimicrobial efficacy of antibiotics, vitamins, and disinfectants.

Detailed Syllabus:

Total Teaching hours: **45 hours**

Unit 1	Introduction to Microbiology – history, branches, scope, importance, Structural Organization of Microorganisms – prokaryotes and eukaryotes, ultra-structure and morphological classification, reproduction/replication, and cultivation of bacteria, fungi and virus Bacterial Physiology – nutritional requirements, raw materials used for culture media, influence of physical parameters on growth, bacterial growth curve, Microbial Techniques – isolation and preservation of pure cultures, cultivation of anaerobes, Microscopy – phase contrast microscopy, dark field microscopy, electron microscopy.	10 Hours
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Unit 2	Identification of bacteria using staining techniques such as simple, Gram's and Acid-fast staining, and biochemical tests (IMViC), quantitative measurement of bacterial growth by total and viable count methods, study of principle, procedure, merits, demerits and applications of physical, chemical, gaseous, radiation and mechanical methods of sterilization, evaluation of the efficiency of sterilization methods, and equipment employed in large-scale sterilization.	10 Hours
Unit 3	Sterility Indicators – Types (physical, chemical, biological) and their role in validating sterilization processes. Disinfectants – Classification and mode of action on microorganisms. Factors Influencing Disinfection – Concentration, time, temperature, pH, organic matter, and microbial type. Antiseptics – Definition, applications, and evaluation. Evaluation of Antimicrobial Action – Methods for testing bacteriostatic (growth inhibition) and bactericidal (killing) activities of disinfectants and antiseptics. Sterility Testing of Products (as per IP, BP, USP) Solid dosage forms Liquid dosage forms Ophthalmic preparations Other sterile pharmaceutical products Methods: Membrane filtration, direct inoculation, and incubation in prescribed media (FTM, SCDM).	6 Hours 4 Hours
Unit 4	Aseptic Area – Designing of aseptic area, laminar flow equipment, sources of contamination in an aseptic area, methods of prevention of contamination, clean area classification. Microbiological Assays – Principles of microbiological assay, methods of assay, standardization of antibiotics, standardization of vitamins, standardization of amino acids, assessment of a new antibiotic.	5 Hours 3 Hours
Unit 5	Microbial Contamination and Spoilage of Pharmaceuticals – Types of spoilage, factors affecting microbial spoilage of pharmaceutical products, sources of microbial contaminants, types of microbial contaminants, assessment of microbial contamination and spoilage, preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations. Microbial limit test Animal Cell Culture – Growth of animal cells in culture, general procedure for cell culture, types of cell cultures – primary, established, transformed, applications of cell culture in pharmaceutical industry and research.	4 Hours 3 Hours

List of Practicals:

1. Introduction and study of different equipment and processing, used in experimental microbiology.
2. Sterilization of glassware, preparation and sterilization of media.
3. Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations. Preparation and Sterility Testing of Prepared Media
4. To study the motility of bacteria by hanging drop preparation.

5. (A): To study the morphology of bacteria by Monochrome Staining.
(B): To perform Metachromatic granule staining.
6. (A): To differentiate the bacteria by Gram staining.
(B): To observe morphology of micro-organism by Negative staining.
7. (A) To study the morphology of spirochetes by Negative staining method.
(B) To study capsule forming bacteria by capsule staining.
8. Isolation of pure culture of micro-organisms by multiple techniques.
9. Estimate the concentration of given antibiotic solution via one level microbial assay method.
10. To determine the % potency of given antibiotic solution by microbiological assay by two level factorial assay method.
11. (A): To perform sterility testing of absorbent cotton.
(B): To perform sterility testing of absorbent gauze.
12. (A): To perform sterility testing of aqueous solution without bactericide.
(B): To perform sterility testing of powder.
13. To perform Bacteriological analysis of water
14. To perform Biochemical test of starch and protein.
15. To perform Fermentation of Carbohydrates.
16. To check the effectiveness of disinfectant using Phenol co-efficient method.

Recommended Books[^]:(Latest Editions)

1. W.B. Hugo and A.D. Russell: *Pharmaceutical Microbiology*, Blackwell Scientific Publications, Oxford, London.
2. Prescott, L.M. and Dunn, C.G.: *Industrial Microbiology*, 4th edition, CBS Publishers & Distributors, Delhi.
3. Pelczar, M.J., Chan, E.C.S., and Krieg, N.R.: *Microbiology*, Tata McGraw-Hill Education.
4. Harris, M.: *Pharmaceutical Microbiology*, Balliere Tindall and Cox, London.
5. Rose, A.H.: *Industrial Microbiology*, Academic Press.
6. Frobisher, M., Hinsdill, R.D. et al.: *Fundamentals of Microbiology*, 9th edition, Japan.
7. Cooper, J. and Gunn, C.: *Cooper and Gunn's Tutorial Pharmacy*, CBS Publishers and Distributors, Delhi.
8. Pepler, H.J.: *Microbial Technology*, Academic Press.
9. **I.P., B.P., U.S.P.** – Latest editions of the Indian Pharmacopoeia, British Pharmacopoeia, and United States Pharmacopoeia.
10. Ananthanarayan, R. and Paniker, C.K.J.: *Textbook of Microbiology*, Orient Longman, Chennai.
11. Edward, A.L.: *Fundamentals of Microbiology*, Publisher not specified.
12. Jain, N.K.: *Pharmaceutical Microbiology*, Vallabh Prakashan, Delhi.
13. *Bergey's Manual of Systematic Bacteriology*, Williams and Wilkins, A Waverly Company

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

[^]This is not an exhaustive list

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Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **B. Pharm**

Semester: **V**

Course Code: **B010502TP**

Course Name: **PHARMACOLOGY-II**

Course Type: **Core**

Year of Introduction: **2026 – 27 (Effective from batch 2024-25)**

Teaching and Examination Scheme:

Number of hours/Week		Number of credits		Total credits	Evaluation Scheme (Marks)						Total Marks				
					Sessional Exams			End Semester Assessment							
L	Tu	P	L	Tu	P	Theory			Practical			End Semester Assessment			
						CIE	E	T	CIE	E	T	T	P		
3	1	4	3	1	2	6	10	15	25	5	20	25	75	75	200

Scope: This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on different systems of body and in addition, emphasis on the basic concepts of bioassay.

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	Demonstrate a comprehensive understanding of the fundamental principles of bioassay.
CO2	Apply pharmacological knowledge of autacoids and related drugs
CO3	Illustrate the pharmacology of drugs acting on endocrine system.
CO4	Utilize the pharmacology of drugs acting on cardio vascular system and urinary system.
CO5	Explain and illustrate the principles of in-vitro, in-vivo, and bioassay techniques used in experimental pharmacology through simulated demonstrations.
CO6	Analyze, interpret, and compare pharmacological responses of drugs using simulated experiments to understand their efficacy, potency, and mechanism of action.

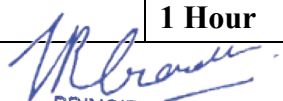
Course Contents:

Total Teaching hours: 45 hours

Unit 1	Pharmacology of drugs acting on cardio vascular system	
	a. Introduction to hemodynamic and electrophysiology of heart.	1 Hour
	b. Drugs used in congestive heart failure	1 Hour



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	c. Anti-hypertensive drugs. d. Anti-anginal drugs. e. Anti-arrhythmic drugs. f. Anti-hyperlipidemic drugs.	2 Hours 2 Hours 2 Hours 2 Hours
Unit 2	Pharmacology of drugs acting on cardio vascular system a. Drug used in the therapy of shock. b. Hematinics, coagulants and anticoagulants. c. Fibrinolytics and anti-platelet drugs d. Plasma volume expanders Pharmacology of drugs acting on urinary system a. Diuretics b. Anti-diuretics.	1 Hour 3 Hours 2 Hours 1 Hour 2 Hours 1 Hour
Unit 3	Autocoids and related drugs a. Introduction to autacoids and classification b. Histamine, 5-HT and their antagonists. c. Prostaglandins, Thromboxanes and Leukotrienes. d. Angiotensin, Bradykinin and Substance P. e. Non-steroidal anti-inflammatory agents f. Anti-gout drugs g. Antirheumatic drugs	1 Hour 3 Hours 2 Hours 1 Hour 1 Hour 1 Hour 1 Hour
Unit 4	Pharmacology of drugs acting on endocrine system a. Basic concepts in endocrine pharmacology. b. Anterior Pituitary hormones- analogues and their inhibitors. c. Thyroid hormones- analogues and their inhibitors. d. Hormones regulating plasma calcium level- Parathormone, Calcitonin and Vitamin-D. e. Insulin, Oral Hypoglycemic agents and glucagon. f. ACTH and corticosteroids.	1 Hour 1 Hour 2 Hours 1 Hour 2 Hours 1 Hour
Unit 5	Pharmacology of drugs acting on endocrine system a. Androgens and Anabolic steroids. b. Estrogens, progesterone and oral contraceptives. c. Drugs acting on the uterus Bioassay a. Principles and applications of bioassay. b. Types of bioassay c. Bioassay of insulin, oxytocin, vasopressin, ACTH, d-tubocurarine, digitalis, histamine and 5-HT	1 Hours 2 Hours 1 Hour 1 Hours 3 Hours

Tutorials

Tutorials will be based on above syllabus



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Tutorial hours: 15 Hours

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List of Practicals:

Course Contents:

Total Teaching hours: 60 hours

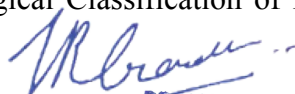
1. Introduction to in-vitro pharmacology and physiological salt solutions.
2. Demonstration of Effect of drugs on isolated frog heart.
3. Effect of drugs on blood pressure and heart rate of dog.
4. Study of diuretic activity of drugs using rats/mice.
5. DRC of acetylcholine using frog rectus abdominis muscle/Chick ileum.
6. Effect of physostigmine and atropine on DRC of acetylcholine using frog rectus abdominis muscle and rat/Chick ileum respectively.
7. Bioassay of histamine using guinea pig/ Chick ileum ileum by matching method.
8. Demonstration of Bioassay of oxytocin using rat uterine horn by interpolation method.
9. Demonstration of Bioassay of serotonin using rat fundus strip by three-point bioassay.
10. Bioassay of acetylcholine using rat/Chick ileum/colon by four-point bioassay.
11. Determination of PA_2 value of prazosin using rat anococcygeus muscle (by Schilds plot method).
12. Determination of PD_2 value using guinea pig/Chick ileum.
13. Effect of spasmogens and spasmolytics using rabbit jejunum/chick ileum.
14. Demonstration of Anti-inflammatory activity of drugs using carrageenan induced paw edema model.
15. Demonstration of Analgesic activity of drug using central and peripheral methods

Note: All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos

Recommended Books^: (Latest Editions)

1. Rang, H. P., Dale, M. M., Ritter, J. M., & Flower, R. J. Rang and Dale's Pharmacology. Churchill Livingstone Elsevier.
2. Katzung, B. G., Masters, S. B., & Trevor, A. J. Basic and Clinical Pharmacology. Tata McGraw-Hill.
3. Goodman & Gilman. The Pharmacological Basis of Therapeutics.
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L. C., Joseph G. B., Wayne A. K., & Bradley R. W. Applied Therapeutics: The Clinical Use of Drugs. The Point Lippincott Williams & Wilkins.
5. Mycek, M. J., Gelnet, S. B., & Perper, M. M. Lippincott's Illustrated Reviews: Pharmacology.
6. Tripathi, K. D. Essentials of Medical Pharmacology. Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma, H. L., & Sharma, K. K. Principles of Pharmacology. Paras Medical Publisher.
8. Craig, C. R., & Stitzel, R. E. Modern Pharmacology with Clinical Applications.
9. Ghosh, M. N. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni, S. K. Handbook of Experimental Pharmacology. Vallabh Prakashan.
11. Essentials of Medical Pharmacology + Pharmacological Classification of Drugs - KD Tripathi




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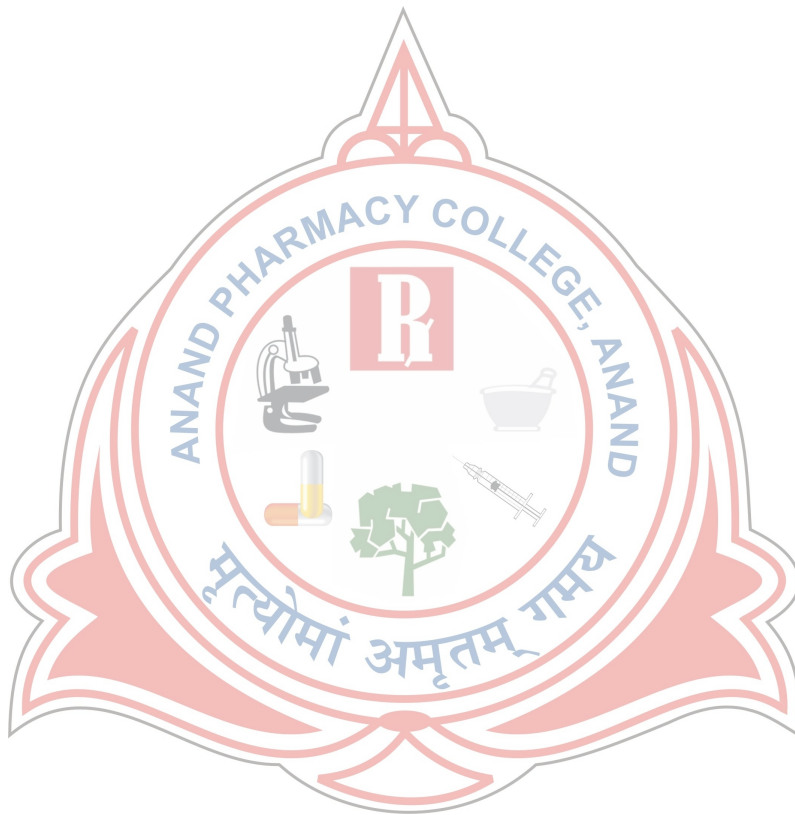
12. David E. Golan's Principles of Pharmacology: The Pathophysiologic Basis of Drug Therapy,
13. Tara V. Shanbhag's Pharmacology for Medical Graduates, · Publisher: Elsevier
14. Barar F.S.K. Textbook of Pharmacology, S Chand And Company Limited

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

^ this is not an exhaustive list



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Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **B. Pharm**

Semester: **V**

Course Code: **B010503TP**

Course Name: **HERBAL DRUG TECHNOLOGY**

Course Type: **Core**

Year of Implementation: **2026–27 (Effective for batch 2024-25)**

Teaching and Examination Scheme:

Number of hours/Week			Number of Credits			Total credits	Evaluation Scheme (Marks)								Total Marks
							Sessional Exams						Term End Assessment		
L	Tu	P	L	Tu	P	6	Theory			Practical			Term End Assessment		
CIE	E	T	CIE	E	T		T	P							
3	1	4	3	1	2	6	10	15	25	5	20	25	75	75	200

Scope:

This subject provides students with a basic understanding of the herbal drug industry, including the quality of raw materials and the guidelines for standardization of herbal drugs. It also covers herbal cosmetics, natural sweeteners, and nutraceuticals. Furthermore, the subject emphasizes Good Manufacturing Practices (GMP) along with patenting and regulatory issues related to herbal drugs.

Course Outcomes (CO):


Upon completion of the course, student shall be able to

CO1	Understand the significance of herbs, organic farming, Good Agricultural Practices (GAP), Indian Systems of Medicine, and traditional formulations.
CO2	Demonstrate the significance of herbal cosmetics and excipients, and apply concepts to conventional and novel dosage forms
CO3	Apply the knowledge related to GMP, patenting, WHO, ICH guideline, and regulatory aspects of ASU drugs.
CO4	Analyze the scope of the nutraceuticals and herbal drug industry, and gain knowledge on use of nutraceuticals in various disorder, possible herb-drug and herb- food interactions.
CO5	Demonstrate skills in extraction and screening, preparation and evaluation of herbal formulations.
CO6	Perform quantitative and qualitative analysis of herbal drugs by estimating phytoconstituents, evaluating excipients, and interpreting monographs.

Detailed Syllabus:



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Total Teaching hours: **45 hours**

<p>Unit 1</p>	<p>Herbs as raw materials Definition of herb, herbal medicine, herbal medicinal product, herbal drug preparation, Source of Herbs, Selection, identification and authentication of herbal materials Processing of herbal raw material</p> <p>Biodynamic Agriculture Good agricultural practices in cultivation of medicinal plants including Organic farming. Pest and Pest management in medicinal plants: Biopesticides/Bioinsecticides.</p> <p>Indian Systems of Medicine a) Basic principles involved in Ayurveda, Siddha, Unani and Homeopathy b) Preparation and standardization of Ayurvedic formulations viz Aristas and Asawas, Ghutika, Churna, Lehya and Bhasma.</p>	<p>03 Hours</p> <p>03 Hours</p> <p>05 Hours</p>
<p>Unit 2</p>	<p>Nutraceuticals General aspects, Market, growth, scope and types of products available in the market. Health benefits and role of Nutraceuticals in ailments like Diabetes, CVS diseases, Cancer, Irritable bowel syndrome and various Gastro intestinal diseases. Study of following herbs as health food: Alfalfa, Chicory, Ginger, Fenugreek, Garlic, Honey, Amla, Ginseng, Ashwagandha, Spirulina</p> <p>Herbal-Drug and Herb-Food Interactions: General introduction to interaction and classification. Study of following drugs and their possible side effects and interactions: Hypercium, Kava-kava, Ginko biloba, Ginseng, Garlic, Pepper & Ephedra.</p>	<p>04 Hours</p> <p>03 Hours</p>
<p>Unit 3</p>	<p>Herbal Cosmetics Sources and description of raw materials of herbal origin used via, fixed oils, waxes, gums colours, perfumes, protective agents, bleaching agents, antioxidants in products such as skin care, hair care and oral hygiene products.</p> <p>Herbal excipients: Herbal Excipients – Significance of substances of natural origin as excipients – colorants, sweeteners, binders, diluents, viscosity builders, disintegrants, flavors & perfumes.</p> <p>Herbal formulations : Conventional herbal formulations like syrups, mixtures and tablets and Novel dosage forms like phytosomes</p>	<p>03 Hours</p> <p>03 Hours</p> <p>04 Hours</p>
<p>Unit 4</p>	<p>Evaluation of Drugs WHO & ICH guidelines for the assessment of herbal drugs Stability testing of herbal drugs.</p> <p>Patenting and Regulatory requirements of natural products: a) Definition of the terms: Patent, IPR, Farmers right, Breeder’s right, Bioprospecting and Biopiracy</p>	<p>03 Hours</p> <p>04 Hours</p>



	<p>b) Patenting aspects of Traditional Knowledge and Natural Products. Case study of Curcuma & Neem.</p> <p>Regulatory Issues - Regulations in India (ASU DTAB, ASU DCC), Regulation of manufacture of ASU drugs - Schedule Z of Drugs & Cosmetics Act for ASU drugs</p>	03 Hours
Unit 5	<p>General Introduction to Herbal Industry Herbal drugs industry: Present scope and future prospects. A brief account of plant-based industries and institutions involved in work on medicinal and aromatic plants in India.</p> <p>Schedule T – Good Manufacturing Practice of Indian systems of medicine Components of GMP (Schedule – T) and its objectives Infrastructural requirements, working space, storage area, machinery and equipment, standard operating procedures, health and hygiene, documentation and records.</p>	03 Hours 04 Hours

Tutorials

Tutorial hours: 15 hours

Tutorials will be based on the above syllabus

List of Practicals

1. To carry out successive solvent extraction and preliminary phytochemical screening of the given crude drug.
2. To prepare and evaluate Herbal Shampoo.
3. To prepare and evaluate Herbal Cream.
4. To determine the alcohol content of Asava/ Arishta.
5. To prepare and evaluate herbal Tablets.
6. To evaluate excipients of natural origin: i) Tragacanth ii) Acacia iii) Agar iv) Gelatin v) Starch
7. To evaluate excipients of natural origin i) Honey ii) Castor oil iii) Lactose iv) Guar gum v) Rose oil
8. To prepare and evaluate Herbal Cleansing Lotion.
9. To prepare and evaluate Herbal Cough Syrup.
10. To estimate Aldehyde content in given Lemon oil.
11. To estimate total alkaloid content in given Datura leaf powder (Acid- base titration).
12. To estimate total phenols from Harde (Haritaki).
13. To estimate total phenol from Triphala Churna.
14. To carry out the Monograph analysis of herbal drugs from recent Pharmacopoeia.
15. To prepare and analyze herbal mixture.

Recommended Books^: (Latest Editions)

1. W.C. Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Saunders & Co., London, 2009.
2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9th Edn., Lea and Febiger, Philadelphia, 1988.




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3. C.K. Kokate, Purohit, Gokhlae. Text book of Pharmacognosy, 56th Edition, Nirali Prakashan, Pune, 2019
4. S. H. Ansari, Essentials of Pharmacognosy, 4th edition, Birla publications, New Delhi, 2011
5. V. D. Rangari, Pharmacognosy & Phytochemistry, 2nd edition , 2017
6. Pharmacopoeial Standards for Ayurvedic Formulations — Central Council for Research in Indian Medicine & Homoeopathy (CCRIMH);also published under the Pharmacopoeia Commission for Indian Medicine & Homoeopathy (PCIM&H), Ministry of AYUSH. PCIM&H publications and the Ayurvedic Pharmacopoeia of India.
7. Pulok K. Mukherjee, Quality Control of Herbal Drugs: An Approach to Evaluation of Botanicals, Business Horizons Publishers, New Delhi, 2002.
8. Herbal drug industry by R.D. Choudhary (1996), 1st Edn, Eastern Publisher, New Delhi.
9. Herbal Cosmetics by H.Pande, Asia Pacific Business press, Inc, New Delhi.
10. WHO: Quality Control Methods for Medicinal Plant Materials, World Health Organization, Geneva, 1988.
11. Government of India, Ministry of AYUSH, The Ayurvedic Pharmacopoeia of India, Part I, Vol. I–X (2022); Part II, Vol. I–IV (2017), 1st Edn., The Controller of Publications, New Delhi, 1989–2022.
12. International Council for Harmonisation (ICH), Q1A(R2): Stability Testing of New Drug Substances and Products (with Annexes), ICH Harmonised Tripartite Guideline, Geneva,2003. Available at: <https://database.ich.org/sites/default/files/Q1A%28R2%29%20Guideline.pdf>




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 Awarding University: Gujarat Technological University, Ahmedabad

Name of Program: **B. Pharm**

Semester: **V**

Course Code: **B010504TT**

Course Name: **BIOPHARMACEUTICS AND PHARMACOKINETICS**

Course Type: **Core**

Year of Implementation: **2026–27 (Effective from batch 2024-25)**

Teaching and Examination Scheme:

Number of hours/Week			Number of Credits			Total credits	Evaluation Scheme (Marks)									Total Marks
							Sessional Exams						Term End Assessment			
L	Tu	P	L	Tu	P	4	Theory			Practical			Term End Assessment			
							CIE	E	T	CIE	E	T	T	P		
3	1	-	3	1	0		10	15	25	-	-	-	75	-	100	

Course Outcomes (CO):

Upon completion of the course, student shall be able to

CO1	Understand the basic concepts & significance of biopharmaceutics factors influencing dosage form design.
CO2	Explain the concept of absorption, distribution, metabolism, excretion, bioavailability and bioequivalence.
CO3	Calculate pharmacokinetic and pharmacodynamic parameters using compartmental and non-compartment model analysis.
CO4	Apply the clinical significance of protein binding, bioequivalence studies, linear and nonlinear pharmacokinetics in therapeutic drug monitoring and formulation development.

Detailed Syllabus:

Total Teaching hours: **45 hours**

Unit 1	Introduction Biopharmaceutics to Absorption; Mechanisms of drug absorption through GIT like passive diffusion, facilitated diffusion, active transport, and endocytosis, factors influencing drug absorption through GIT including physicochemical properties of drugs, physiological conditions of the GIT, and dosage form design, absorption of drug from Non-per oral extra-vascular routes such as parenteral, pulmonary, nasal, buccal, rectal, ocular, and transdermal routes. Distribution Tissue permeability of drugs, binding of drugs, apparent, volume of drug distribution, plasma and tissue protein binding of	10 Hours
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	drugs, factors affecting protein-drug binding. Kinetics of protein binding, Clinical significance of protein binding of drugs in determining drug action, elimination, interactions, and therapeutic monitoring.	
Unit 2	<p>Elimination: Drug metabolism and basic understanding metabolic pathways including Phase I (oxidation, reduction, hydrolysis) and Phase II (conjugation) reactions, renal excretion of drugs such as glomerular filtration, tubular secretion, and reabsorption, factors affecting renal excretion of drugs such as physicochemical properties of drugs, protein binding, urine pH, blood flow, and pathological condition, concepts of renal clearance, non-renal routes of drug excretion of drugs</p> <p>Bioavailability and Bioequivalence: Definition and Objectives of bioavailability, types including absolute and relative bioavailability, measurement of bioavailability with reference to plasma concentration-time data, urinary excretion studies, and pharmacodynamic approaches, in-vitro drug dissolution models including zero-order, first-order, Hixson–Crowell, Higuchi, and Korsmeyer–Peppas models, in-vitro-in-vivo correlations, bioequivalence studies highlighting its importance in formulation development and regulatory approval, methods to enhance the dissolution rates and bioavailability of poorly soluble drugs such as particle size reduction, salt formation, use of surfactants, solid dispersions, complexation, lipid-based formulations, and novel drug delivery approaches</p>	10 Hours
Unit 3	<p>Pharmacokinetics: Definition and introduction to Pharmacokinetics, Dosage regimen, therapeutic index, Plasma drug concentration-time profile, Pharmacokinetic and pharmacodynamic parameters), Types, application and comparison of pharmacokinetic models (Compartment models, Non-compartment models, physiological models, distributed parameter models)</p> <p>One compartment open model (a) Intravenous Injection (Bolus) (b) Intravenous infusion and (c) Extra vascular administrations. Interpretation of plasma concentration–time profiles and how these models simplify the understanding of drug movement in the body. Pharmacokinetics parameters- KE, $t_{1/2}$, V_d, AUC, K_a, Cl_t and CLR-definitions methods of eliminations, understanding of their significance and Application</p>	10 Hours
Unit 4	<p>Multicompartment models: Introduction to multicompartment kinetics with emphasis on the Two compartment open model. IV bolus Kinetics of multiple dosing, steady state drug levels, Concept, calculation, and clinical significance of loading and maintenance doses and their significance in clinical settings.</p>	08 Hours



Unit 5	Nonlinear Pharmacokinetics: Introduction to nonlinear pharmacokinetics and its distinction from linear kinetics. Factors responsible for non-linearity including dose-dependent absorption, plasma protein binding, metabolism, and excretion. Michaelis–Menten kinetics: principles, equations, and graphical methods for estimation of pharmacokinetic parameters (V_{max} and K_m). Explanation of saturation kinetics with suitable drug examples along with clinical implications in dosage regimen design and therapeutic drug monitoring.	07 Hours
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Tutorials

Tutorial hours: 15 Hours

Tutorials will be based on the above syllabus.

Recommended Books[^]:(Latest Editions)

1. Gibaldi, M. Biopharmaceutics and Clinical Pharmacokinetics. Lea & Febiger, Philadelphia.
2. Notari, R.F. Biopharmaceutics and Pharmacokinetics. Marcel Dekker Inc., New York.
3. Shargel, L. and Yu, A.B.C. Applied Biopharmaceutics and Pharmacokinetics. 4th Edition. Prentice-Hall International Edition, USA.
4. Brahmankar, D.M. and Jaiswal, S.B. Biopharmaceutics and Pharmacokinetics – A Treatise. Vallabh Prakashan, Pitampura, Delhi.
5. Gibaldi, M. and Perrier, D. Pharmacokinetics. Marcel Dekker Inc., New York.
6. Gibaldi, M. and Prescott, L. Handbook of Clinical Pharmacokinetics. ADIS Health Science Press.
7. Swarbrick, J. Biopharmaceutics. (Publisher not specified).
8. Rowland, M. and Tozer, T.N. Clinical Pharmacokinetics: Concepts and Applications. Lea & Febiger, Philadelphia, 1995.
9. Abdou, H.M. Dissolution, Bioavailability and Bioequivalence. Mack Publishing Company, Pennsylvania, 1989.
10. Notari, R.F. Biopharmaceutics and Clinical Pharmacokinetics: An Introduction. 4th Edition, Revised and Expanded. Marcel Dekker Inc., New York and Basel, 1987.
11. Mack Publishing Company. Remington's Pharmaceutical Sciences. Pennsylvania

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

[^]This is not an exhaustive list



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

Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **B. Pharm**

Semester: **V**

Course Code: **B010505TT**

Course Name: **MEDICINAL CHEMISTRY II**

Course Type: **Core**

Year of Implementation: **2026–27 (Effective from batch-2024-25)**

Teaching and Examination Scheme:

Number of hours/Week			Number of Credits			Total credits	Evaluation Scheme (Marks)						Total Marks	
							Sessional Exams			Term End Assessment				
L	Tu	P	L	Tu	P	Theory			Practical			T	P	
						CIE	E	T	CIE	E	T			
3	1	-	3	1	-	4	10	15	25	-	-	75	-	100

Scope: This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

Course Outcomes (CO):

Upon completion of the course, student shall be able to

CO1	Understand the principles of medicinal chemistry of drugs with respect to their pharmacological activity, structure, classification and uses.
CO2	Know the metabolic pathways of drugs, including their adverse effects and therapeutic importance.
CO3	Recognise the Structure-Activity Relationship (SAR) of different drug classes to understand how structural modifications impact biological activity.
CO4	Demonstrate knowledge of the chemical synthesis of selected drugs.

Detailed Syllabus:

Total Teaching hours: **45 hours**

Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs superscripted (*)

Unit1	Antihistaminic agents: Histamine, receptors and their distribution in the human body H1-antagonists: Diphenhydramine hydrochloride*, Dimenhydrinate,	05 Hours
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	<p>Doxylamines succinate, Clemastine fumarate, Diphenylphyraline hydrochloride, Tripelenamine hydrochloride, Chlorcyclizine hydrochloride, Meclizine hydrochloride, Buclizine hydrochloride, Chlorpheniramine maleate, Triprolidine hydrochloride*, Phenidamine tartarate, Promethazine hydrochloride*, Trimeprazine tartrate, Cyproheptadine hydrochloride, Azatidine maleate, Astemizole, Loratadine, Cetirizine, Levocetrazine Cromolyn sodium</p> <p>H2-antagonists: Cimetidine*, Famotidine, Ranitidine</p> <p>Gastric Proton pump inhibitors: Omeprazole, Lansoprazole, Rabeprazole, Pantoprazole</p> <p>Anti-neoplastic agents:</p> <p>Alkylating agents: Mechlorethamine*, Cyclophosphamide, Melphalan Chlorambucil, Busulfan, Thiotepa</p> <p>Antimetabolites: Mercaptopurine*, Thioguanine, Fluorouracil, Floxuridine, Cytarabine, Methotrexate*, Azathioprine</p> <p>Antibiotics: Dactinomycin, Daunorubicin, Doxorubicin, Bleomycin</p> <p>Plant products: Etoposide, Vinblastine sulphate, Vincristine sulphate</p> <p>Miscellaneous: Cisplatin, Mitotane</p>	05 Hours
Unit2	<p>Anti-anginal:</p> <p>Vasodilators: Amyl nitrite, Nitroglycerin*, Pentaerythritol tetranitrate, Isosorbide dinitrite*, Dipyridamole</p> <p>Calcium channel blockers: Verapamil, Bepridil hydrochloride, Diltiazem hydrochloride, Nifedipine, Amlodipine, Felodipine, Nicardipine, Nimodipine.</p> <p>Diuretics:</p> <p>Carbonic anhydrase inhibitors: Acetazolamide*, Methazolamide, Dichlorphenamide. Thiazides: Chlorthiazide*, Hydrochlorothiazide, Hydroflumethiazide, Cyclothiazide,</p> <p>Loop diuretics: Furosemide*, Bumetanide, Ethacrynic acid.</p> <p>Potassium sparing Diuretics: Spironolactone, Triamterene, Amiloride.</p> <p>Osmotic Diuretics: Mannitol</p> <p>Anti-hypertensive Agents: Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride*, Clonidine hydrochloride, Guanethidine monosulphates, Guanabenz acetate, Sodium nitroprusside, Diazoxide, Minoxidil, Reserpine, Hydralazine hydrochloride.</p>	<p>02 Hours</p> <p>03 Hours</p> <p>05 Hours</p>
Unit3	Anti-arrhythmic Drugs: Quinidine sulphate, Procainamide hydrochloride,	03 Hours

	<p>Disopyramide phosphate*, Phenytoin sodium, Lidocaine hydrochloride, Tocainide hydrochloride, Mexiletine hydrochloride, Lorcaïnide hydrochloride, Amiodarone, Sotalol.</p> <p>Anti-hyperlipidemic agents: Clofibrate, Lovastatin, Cholesteramine and Cholestipol</p> <p>Coagulant & Anticoagulants: Menadione, Acetomenadione, Warfarin*, Anisindione, clopidogrel</p> <p>Drugs used in Congestive Heart Failure: Digoxin, Digitoxin, Nesiritide, Bosentan, Tezosentan.</p>	<p>02 Hours</p> <p>03 Hours</p> <p>02 Hours</p>
Unit4	<p>Drugs acting on Endocrine system Nomenclature, Stereochemistry and metabolism of steroids Sex hormones: Testosterone, Nandralone, Progesterones, Estriol, Estradiol, Estrone, Diethyl stilbestrol. Drugs for erectile dysfunction: Sildenafil, Tadalafil. Oral contraceptives: Mifepristone, Norgestrel, Levonorgestrol Corticosteroids: Cortisone, Hydrocortisone, Prednisolone, Betamethasone, Dexamethasone Thyroid and antithyroid drugs: L-Thyroxine, L-Thyronine, Propylthiouracil, Methimazole.</p>	<p>06 Hours</p> <p>02 Hours</p>
Unit5	<p>Antidiabetic agents: Insulin and its preparations Sulfonyl urea: Tolbutamide*, Chlorpropamide, Glipizide, Glimepiride. Biguanides: Metformin. Thiazolidinediones: Pioglitazone, Rosiglitazone. Meglitinides: Repaglinide, Nateglinide. Glucosidase inhibitors: Acarbose, Voglibose.</p> <p>Local Anesthetics: SAR of Local anesthetics Benzoic Acid derivatives; Cocaine, Hexylcaine, Meprylcaine, Cyclomethycaine, Piperocaine. Amino Benzoic acid derivatives: Benzocaine*, Butamben, Procaine*, Butacaine, Propoxycaine, Tetracaine, Benoxinate. Lidocaine/Anilide derivatives: Lignocaine, Mepivacaine, Prilocaine, Etidocaine. Miscellaneous: Phenacaine, Dipiperodon, Dibucaine*</p>	<p>04 Hours</p> <p>03 Hours</p>

Tutorials

Tutorials will be based on the above syllabus



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Tutorial hours: 15 Hours

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Recommended Books^(Latest Editions)

1. John M, Beale JH. Wilson and Giswold's Organic Medicinal and Pharmaceutical Chemistry. Lippincott Williams & Wilkins.
2. Foye WO. Foye's Principles of Medicinal Chemistry. Lippincott Williams & Wilkins.
3. Abraham DJ, Myers M. Burger's Medicinal Chemistry, Drug Discovery and Development, Vol I to IV. John Wiley & Sons.
4. Smith HJ, Williams H. Introduction to the Principles of Drug Design. Elsevier.
5. Remington JP. Remington: The Science and Practice of Pharmacy. Lippincott Williams & Wilkins.
6. Martindale W. The Extra Pharmacopoeia. HK Lewis.
7. Finar IL. Organic Chemistry, Volume 2: Stereochemistry and The Chemistry Natural Products. Pearson Education India.
8. Lednicer D, Mitscher LA. The Organic Chemistry of Drug Synthesis, volume 1 to 5. John Wiley & Sons.
9. Indian Pharmacopoeia., The Controller of Publications, New Delhi.
10. Vogel AI. Practical Organic Chemistry. Longmans.

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **B. Pharm**

Semester: **V**

Course Code: **B010506ET**

Course Name: **CONTRIBUTOR PERSONALITY DEVELOPMENT PROGRAM**

Course Type: **Elective (VAC- Value Added Course)**

Year of Implementation: **2026–27 (Effective from batch 2024-25)**

Teaching and Examination Scheme:

Number of hours/Week			Number of Credits			Total credits	Evaluation Scheme (Marks)									Total Marks
							Sessional Exams						Term End Assessment			
L	Tu	P	L	Tu	P	4	Theory			Practical			T		P	
								CIE	E	T	CIE	E	T			
4	0	0	4	0	0	4	10	15	25	0	0	0	75	0	100	

Scope:

Improve the employability of students by giving them the right work ethic and thinking that employers are looking for.

- Build their confidence with which they can go into any job and contribute meaningfully.
- Improve their ability to engage better in the workplace and to be able to handle the challenges that come up there.
- Build their career-worthiness and help them develop into future-ready contributors with ability to navigate a career in a volatile, changing world.
- Widen their choices of career and success, so that they are able to open up more opportunities for themselves and take up unconventional career pathways.
- Enable them to recognize how they, as technical professionals, can participate and make a positive contribution to their communities and to their state.

Towards this goal, the Contributor Program has been designed to awaken and strengthen students from within, in terms of building positive self-esteem, increasing their confidence level and I-can attitude, improving their aspirations, giving them new methods of thinking, building their cognitive capacities, exposing them to the skills and practices associated with being contributors in the workplace (not mere employees).

The Program content is also designed to expose students to real-world workplace scenarios and sensitize them to some of the challenges faced in society around them, especially in the local communities around them and in their own state of Gujarat.



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The Contributor Program syllabus has been evolved and fine-tuned over several years, (a) to address the changing need and contemporary challenges being faced by industry and what employers of today are looking for in the people they hire and (b) by working extensively with universities and students building an appreciation of their challenges and concerns. At the core, the program is guided by the higher ideas and principles of practical Vedanta in work.

Course Outcomes (CO):

Upon completion of the course, student shall be able to

CO1	Students will be able to recognize and appreciate alternative ideals of work and self-identity, understanding the importance of being contributors rather than mere workers, and developing positive identities that foster intrinsic self-esteem and confidence.
CO2	Students will be able to differentiate between limiting and empowering mindsets in approaching challenges, recognize the impact of “creator” versus “victim” stances, and appreciate how focusing on building sustainable foundations leads to lasting success rather than simply chasing short-term outcomes.
CO3	Students will be able to recognize and appreciate diverse career models and growth pathways, enabling them to make informed choices and expand their contributions in any role.
CO4	Students will be able to analyze their experiences and apply contributor thinking to real-world and career-relevant challenges to showcase their value to employers.

Detailed Syllabus:

Total Teaching hours: **45 hours**

Unit1	The Contributor Work Ideal In this topic, students explore what is their “ideal” of work - is the ideal to be a “worker” or to be a “contributor”? For example, an employee who has the ideal of a “worker” goes to work to pass time, earn a living, get benefits; in contrast to an employee with the ideal of a “contributor” who wants to make a difference, get things done well, create value for the company. This enables students to transform their expectation of themselves in work.	1.5 Hours Classroom engagement (including self discovery/ solutioning sessions)
Unit2	Identity & Self-esteem In this topic, students engage with the question “who am I?” or on what basis do they define themselves. Is their identity defined by what others think of them (extrinsic self-esteem) or by what they think of themselves (intrinsic self-esteem)? Further, they discover positive identities that lead to intrinsic self-esteem, such as an I-can identity based on one’s capacity and inner strength. This enables them to build confidence and self-esteem.	Same as above
Unit3	Become a Creator of one’s destiny In a “victim stance”, we see the career environment as full of difficulties and hurdles. We feel powerless or blame our circumstances for not having many opportunities. This makes us	Same as above

	<p>fearful of uncertainty and makes us settle for jobs where we remain mediocre. In this topic, students discover the “creator of destiny stance” to challenges and situations. This stance frees them to try out new things, open up new possibilities, take on responsibility, see the opportunity hidden in their environment.</p>	
Unit4	<p>Achieving Sustainable Success In this topic, students discover how to achieve sustainable or lasting success, by building one’s “engine of success”, making them success worthy. Where their focus shifts to building one’s “engine of success” rather than being on chasing the “fruits of success”. This is important, because over a lifetime of work, all people go through ups and downs – where the fruits are not in their control. People who are focused on the fruits of success, fall prey to disappointment, loss in motivation, quitting too early, trying to find shortcuts – when fruits don’t come. Whereas people focused on building their engine of success continue to contribute steadily, irrespective of whether fruits come or not. And with a strong engine of success, fruits come to them in time.</p>	Same as above
Unit5	<p>Career Development Models In this topic, students explore a range of diverse “career development models” and the possibilities for contribution each opens up to them (e.g. start-up career model, change-maker career model, etc.). This opens their mind to different and even unconventional career models possible, beyond the usual (such as “stable large company career model” where one gets an engineering degree, then MBA, then get a job in a large company). This frees them from a herd mentality when making career choices.</p>	Same as above
Unit6	<p>Expanding contribution in every role In this topic, students explore the many roles they can play in their life & discover the power they have to expand the contribution possible in any role. (E.g. role of student, role of manager, role of a project site engineer). So, the potential of a role is in the individual’s hands. This opens their mind to an alternative way of career growth.</p>	Same as above
Unit7	<p>Finding Solutions The market environment in which organizations are operating, is becoming increasingly dynamic and uncertain. So, employers are increasingly seeking out people who can innovate and figure out solutions in the face of any challenge (unlike in the past when it was the people who were most efficient and productive, who were valued by organizations). At the heart of innovation lies this way of thinking of “finding solutions” rather than “seeing problems or roadblocks”. Students learn how to build this way of thinking, in this topic.</p>	1.5 Hours Classroom engagement (including self discovery/ solutioning sessions)



Unit8	Creating Value Companies are also looking for employees who do not just work hard, or work efficiently or productively - but those who will make a valuable difference to the fortunes of the company. This difference may come from innovation, but it may also come from focusing on the right things and identifying what really matters – both to the company and to the customers. In this topic, students learn how to build this capability.	Same as above
Unit9	Engaging deeply The environment we live in is becoming increasingly complex because more and more things are getting interconnected, new fields are emerging, technologies are rapidly changing, capabilities and knowledge one is trained in will become fast obsolete. In such a scenario, the student’s ability to quickly understand and master what is going on, dive deep, get involved in any area, rapidly learn new capabilities that a job demands, is important. Engaging deeply is a core way of thinking that can help them in this. In this topic, students learn how to engage deeply.	Same as above
Unit10	Enlightened self-interest & collaboration at work The changing nature of work in organizations and in the global environment is increasingly demanding that people work more collaboratively towards shared goals and more sustainable goals. A key to working successfully when multiple stakeholders are involved is “thinking in enlightened self-interest”. In this topic, students learn how to develop this way of thinking (going beyond “narrow self-interest”).	Same as above
Unit11	Human-centered thinking & Empathy In this topic, students explore a human-centric approach to work – where the ability to recognize and respond to other people (whether they are users or customers or team members) as a human being with human needs and difficulties, is essential. This is at the heart of user-centric design of products and solutions, at the heart of genuine customer-centricity in services, and of any successful interaction with other people.	Same as above
Unit12	Trust Conduct The biggest currency in a sustainable career is “trust” i.e. being trusted by team members, bosses, and customers. When we are trusted, people listen to us, they are willing to give us the chance to grow, give us the space to make mistakes, and work seamlessly with each other without always having to “prove ourselves”. In this topic, students learn how to demonstrate conduct that builds the trust of people.	Same as above



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Recommended Books^:(Latest Editions)

1. Illumine, *Contributor Personality Program textbook cum workbook*, Illumine Foundation
2. Illumine Foundation, *Web-based Active Guide TM for self-exploration of rich media resources*, Illumine Foundation
3. Srinivas V., *On Contributors*, Illumine Ideas
4. Swami Ranganathananda, *Enlightened Citizenship and Democracy*, Bharatiya Vidya Bhavan.
5. Swami Ranganathananda, *Eternal Values for a Changing Society – Vol I-IV*, Bharatiya Vidya Bhavan
6. Swami Vivekananda, *Karma Yoga*, Advaita Ashrama
7. Swami Vivekananda, *Vivekananda: His Call to the Nation*, Advaita Ashrama
8. Nathaniel Branden, *Six Pillars of Self Esteem*, Bantam
9. Carol S. Dweck, *Mindset: The New Psychology of Success*, Random House Publishing Group
10. Tad Waddington, *Lasting Contribution: How to Think, Plan, and Act to Accomplish Meaningful Work*, Agate Publishing
11. Barry Nalebuff, Ian Ayres, *Why not?: how to use everyday ingenuity to solve problems big and small*, Harvard Business School Press
12. Erik Stern, Mike Hutchinson, *The Value Mindset: Returning to the First Principles of Capitalist Enterprise (Ch 8 & 9)*, John Wiley and Sons
13. Jim Loehr, Tony Schwartz, *The Power of Full Engagement: Managing Energy, Not Time, is the Key to High Performance and Personal Renewal*, Simon and Schuster
14. Michael E. Porter, Mark R. Kramer, *Creating Shared Value*, Harvard Business Review
15. Stephen M. R. Covey, Rebecca R. Merrill, Stephen R. Covey, *The Speed of Trust: The One Thing That Changes Everything*, Free Press
16. Henry Cloud, *The Courage to Meet the Demands of Reality*, HarperCollins
17. Howard Gardner, *Responsibility at Work: How Leading Professionals Act (or Don't Act) Responsibly*, John Wiley & Sons

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Awarding University: Gujarat Technological University, Ahmedabad



Name of Program: **B. Pharm**

Semester: **V**

Course Code: **B010507ET**

Course Name: **INTEGRATED PERSONALITY DEVELOPMENT COURSE**

Course Type: **Elective (VAC- Value Added Course)**

Year of Introduction: **2026 – 27 (Effective from batch 2024-25)**

Teaching and Examination Scheme:

Number of hours/Week			Number of credits			Total credits	Evaluation Scheme (Marks)									Total Marks
							Sessional Exams						End Semester Assessment			
L	Tu	P	L	Tu	P		Theory			Practical			T	P		
4	-	-	4	-	-	4	CIE	E	T	CIE	E	T	75	-	100	

Scope:

Integrated Personality Development Course (IPDC) aims to prepare students for the modern challenges they face in their daily lives. Promoting fortitude in the face of failures, unity amongst family discord, self-discipline amidst distractions, and many more priceless lessons. The course focuses on morality and character development at the core of student growth, to enable students to become self-aware, sincere, and successful in their many roles - as an ambitious student, reliable employee, caring family member, and considerate citizen.

Course Outcomes (CO):

Upon completion of the course student shall be able to

CO1	To provide students with a holistic value-based education that will enable them to be successful in their academic, professional, and social lives and to enhance awareness of India's glory and global values, and to create considerate citizens who strive for the betterment of their family, college, workforce, and nation.
CO2	To give the students the tools to develop effective habits, promote personal growth, and improve their wellbeing, stability, and productivity and to inspire students to strive for a higher sense of character by learning from role models who have lived principled, disciplined, and value-based lives.
CO3	To allow students to establish a stronger connection with their family through critical thinking and devolvement of qualities such as unity, forgiveness, empathy, and effective communication.



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CO4	To provide students with soft skills that complement their hard skills, making them more marketable when entering the workforce.
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Course Contents:

Total Teaching hours: 60 hours

Unit 1	Remaking Yourself <ul style="list-style-type: none"> a) Restructuring Yourself 2 Hours b) Power of Habit 2 Hours c) Handling Social Media 2 Hours d) Begin with the End in Mind 2 Hours e) Being Addiction-Free 2 Hours f) Stress Management 2 Hours g) Better Health Better Future 2 Hours h) Impact of Company 2 Hours
Unit 2	Learning from Legends <ul style="list-style-type: none"> a) Tendulkar & Tata 2 Hours b) A.P.J. Abdul Kalam 2 Hours c) Leading Without Leading 2 Hours d) Words of Wisdom 2 Hours Facing Failures <ul style="list-style-type: none"> a) Welcoming Challenges 2 Hours b) Significance of Failures 2 Hours c) Power of Faith 2 Hours d) Timeless Wisdom for Daily Life 2 Hours
Unit 3	From House to Home <ul style="list-style-type: none"> a) Listening & Understanding 2 Hours b) Bonding the Family 2 Hours c) Forgive & Forget 2 Hours Selfless Service <ul style="list-style-type: none"> a) Seva 2 Hours b) Case Study: Disaster Relief 2 Hours
Unit 4	Soft Skills <ul style="list-style-type: none"> a) Networking & Leadership 2 Hours b) Project Management 2 Hours c) Teamwork & Harmony 2 Hours d) Financial Planning 2 Hours
Unit 5	My India My Pride <ul style="list-style-type: none"> a) Glorious Past - Part 1 2 Hours b) Glorious Past - Part 2 2 Hours c) Present Scenario 2 Hours d) An Ideal Citizen – 1 2 Hours e) An Ideal Citizen - 2 2 Hours

Recommended Books^: (Latest Editions)

1. IPDC Workbook-1 (presented by B.A.P.S. Swaminarayan Sanstha)
2. IPDC Workbook-2 (presented by B.A.P.S. Swaminarayan Sanstha)

IPDC REFERENCES –

These are the reference material for the IPDC lectures. This is not compulsory reading for the students as the essential information is contained in the workbooks.

Unit No.	Topic	References
1	Remaking Yourself	<ol style="list-style-type: none">1. Power of Habit, Charles Duhigg, Random House Trade Paperbacks, 20142. Change Your Habit, Change Your Life, Tom Corley, North Loop Books, 20163. The Seven Habits of Highly Effective People, Stephen Covey, Simon & Schuster, 20134. Seven Habits of Highly Effective Teens, Sean Covey, Simon & Schuster, 20125. Atomic Habits, James Clear, Random House, 20186. How a handful of tech companies control billions of minds every day, Tristan Harris, TED Talk, 2017
2	Learning from Legends	<ol style="list-style-type: none">1. Chase Your Dreams: My Autobiography, Sachin Tendulkar, Hachette India, 20172. Playing It My Way: My Autobiography, Sachin Tendulkar, Hodder & Stoughton, 20143. The Wit and Wisdom of Ratan Tata, Ratan Tata, Hay House, 20184. The Tata Group: From Torchbearers to Trailblazers, Shashank Shah, Penguin Portfolio, 20185. The Leader Who Had No Title, Robin Sharma, Jaico Publishing House, 20106. In the Joy of Others: A Life-Sketch of Pramukh Swami Maharaj, Mohanlal Patel and BAPS Sadhus, Swaminarayan Aksharpith, 2013
2	Facing Failures	<ol style="list-style-type: none">1. Thomas Edison's factory burns down, New York Times Archives, Page 1, 10/12/19142. Lincoln Financial Foundation, Abraham Lincoln's "Failures": Critiques, Forgotten Books, 20173. J.K. Rowling Harvard Commencement Speech Harvard University Commencement, 20084. Born Again on the Mountain: A Story of Losing Everything and Finding It Back, Arunima Sinha, Penguin, 20145. Failing Forward: Turning Mistakes Into Stepping Stones for Success, John C. Maxwell, Thomas Nelson, 20076. Steve Jobs: The Exclusive Biography Paperback, Walter Isaacson, Abacus, 2015

		7. Failing Forward: Turning Mistakes Into Stepping Stones for Success, John C. Maxwell, Thomas Nelson, 2007
3	From House to Home	1. “What Makes a Good Life? Lessons from the Longest Study on Happiness”, R. Waldinger, Ted Talks, 2015 2. Long Walk To Freedom, Nelson Mandela, Back Bay Books, 1995 3. Outliers, Malcolm Gladwell, Back Bay Books, 2011
3	Selfless Service	1. Open: An Autobiography, Andre Agassi, Vintage, 10 August 2010 2. The Physiological Power of Altruism [online], James Hamblin, The Atlantic, December 30, 2015, https://www.theatlantic.com/health/archive/2015/12/altruism-for-a-better-body/422280/ [last accessed June 10, 2020] 3. TBI Blogs: From Entrepreneurs to Doorkeepers, Everybody Serves with Love & Warmth at This Ahmedabad Café [online], The People Place Project, The Better India, May 29, 2017, https://www.thebetterindia.com/102551/small-way-serve-ahmedabad-seva-cafe/ , [last accessed June 10, 2020]
4	Soft Skills	1. The 17 Indisputable Laws of Teamwork, John Maxwell, HarperCollins, 2013 2. Team of Teams: New Rules of Engagement for a Complex World, Stanley McChrystal, Portfolio, 2015 3. Predictably Irrational, Revised and Expanded Edition: The Hidden Forces That Shape Our Decisions, Dan Ariely, Harper Perennial, 2010
5	My India My Pride	1. Rishis, Mystics, and Heroes of India, Sadhu Mukundcharandas, Swaminarayan Aksharpath, 2011 2. Physics in Ancient India, Narayan Dongre, Shankar Nene, National Book Trust, 2016 3. The Rise of Civilization in India and Pakistan, Raymond Allchin, Bridget Allchin, Cambridge University Press, 1982 4. The Āryabhaṭīya of Āryabhaṭa: An Ancient Indian Work on Mathematics and Astronomy (1930), Walter Eugene Clark, University of Chicago Press, reprint, Kessinger Publishing, 2006

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