Gandhinagar Institute of Pharmacy

Bachelor of Pharmacy (Undergraduate)

Semester 5

SCHEME OF TEACHING

Course Code	Name of the Course	No. of Hours	Tutorial	Credit Points
BP501T	Medicinal Chemistry-II (Theory)	3	1	4
BP502T	Industrial Pharmacy I (Theory)	3	1	4
BP503T	Pharmacology II (Theory)	3	1	4
BP504T	Pharmacognosy and Phytochemistry II (Theory)	3	1	4
BP505T	Pharmaceutical Jurisprudence (Theory)	3	1	4
BP506T	Contributor Personality Development Program (Theory)	4	-	4
BP502P	Industrial Pharmacy I (Practical)	4	-	2
BP503P	Pharmacology II (Practical)	4	-	2
BP504P	Pharmacognosy and Phytochemistry II (Practical)	4	-	2
BP506P	Contributor Personality Development Program (Practical)	-	-	-
	Total	**31**	**5**	**30**

Gandhinagar Institute of Pharmacy

Bachelor of Pharmacy (Undergraduate)

Semester 5

SCHEME OF EVALUATION

Course Code	Name of the Course	Marks Distribution			
		University (End Semester Exam)	Institute		Total
			Sessional Exams	Continuous Mode	
BP501T	Medicinal Chemistry-II (Theory)	75	15	10	100
BP502T	Industrial Pharmacy I (Theory)	75	15	10	100
BP503T	Pharmacology II (Theory)	75	15	10	100
BP504T	Pharmacognosy and Phytochemistry II (Theory)	75	15	10	100
BP505T	Pharmaceutical Jurisprudence (Theory)	75	15	10	100
BP506T	Contributor Personality Development Program (Theory)	75	15	10	100
BP502P	Industrial Pharmacy I (Practical)	35	10	5	50
BP503P	Pharmacology II (Practical)	35	10	5	50
BP504P	Pharmacognosy and Phytochemistry II (Practical)	35	10	5	50
BP506P	Contributor Personality Development Program (Practical)	35	10	5	50
Total		**590**	**130**	**80**	**800**

Subject Code: BP501T	Subject Title: Medicinal Chemistry-II (Theory)
Pre-requisite: --	

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 Objective: Upon completion of this course the students would be able to

1. Understand the chemistry of drugs with respect to their pharmacological activity
2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
3. Know the Structural Activity Relationship of different class of drugs
4. Study the chemical synthesis of selected drugs

Teaching Scheme (Hours per week)			Evaluation Scheme (Marks)			
			Theory			Total
Lecture	Tutorial	Credit	University Assessment	Continuous Assessment	Internal Assessment	
3	1	4	75	10	15	100

Course Content:

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 (*)

Detailed Syllabus:

Sr. No.	UNIT	Hours	Weightage (%)
1.	**Antihistaminic agents:** Histamine, receptors and their distribution in the human body **H1–antagonists:** Diphenhydramine hydrochloride*, Dimenhydrinate, Doxylamines cuccinate, 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 **H2-antagonists:** Cimetidine*, Famotidine, Ranitidin **Gastric Proton pump inhibitors:** Omeprazole, Lansoprazole, Rabeprazole, Pantoprazole **Anti-neoplastic agents:** **Alkylating agents:** Meclorethamine*, Cyclophosphamide, Melphalan Chlorambucil, Busulfan, Thiotepa **Antimetabolites:** Mercaptopurine*, Thioguanine, Fluorouracil,	**10 Hours**	**22.22%**

Sr. No.	UNIT	Hours	Weightage (%)
	Floxuridine, Cytarabine, Methotrexate*, Azathioprine **Antibiotics:** Dactinomycin, Daunorubicin, Doxorubicin, Bleomycin **Plant products:** Etoposide, Vinblastin sulphate, Vincristin sulphate **Miscellaneous:** Cisplatin, Mitotane		
2.	Anti-anginal: Vasodilators: Amyl nitrite, Nitroglycerin*, Pentaerythritol tetranitrate, Isosorbide dinitrite*, Dipyridamole Calcium channel blockers: Verapamil, Bepridil hydrochloride, Diltiazem hydrochloride, Nifedipine, Amlodipine, Felodipine, Nicardipine, Nimodipine. Diuretics: Carbonic anhydrase inhibitors: Acetazolamide*, Methazolamide, Dichlorphenamide. Thiazides: Chlorthiazide*, Hydrochlorothiazide, Hydroflumethiazide, Cyclothiazide, Loop diuretics: Furosemide*, Bumetanide, Ethacrynic acid. Potassium sparing Diuretics: Spironolactone, Triamterene, Amiloride. Osmotic Diuretics: Mannitol Anti-hypertensive Agents: Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride,* Clonidine hydrochloride, Guanethidine monosulphate, Guanabenz acetate, Sodium nitroprusside, Diazoxide,Minoxidil, Reserpine, Hydralazine hydrochloride	**10 Hours**	**22.22%**
3.	**Anti-arrhythmic Drugs:** Quinidine sulphate, Procainamide hydrochloride, Disopyramide phosphate*, Phenytoin sodium, Lidocaine hydrochloride, Tocainide hydrochloride, Mexiletine hydrochloride, Lorcainide hydrochloride, Amiodarone, Sotalol. Anti-hyperlipidemic agents: Clofibrate, Lovastatin, Cholesteramine and Cholestipol Coagulant & Anticoagulants: Menadione, Acetomenadione, Warfarin*, Anisindione, clopidogrel Drugs used in Congestive Heart Failure: Digoxin, Digitoxin, Nesiritide, Bosentan, Tezosentan.	**10 Hours**	**22.22%**
4.	**Drugs acting on Endocrine system**: Nomenclature, Stereochemistry and metabolism of steroids Sex hormones: Testosterone, Nandralone, Progestrones, Oestriol, Oestradiol, Oestrione, Diethyl stilbestrol. Drugs for erectile dysfunction: Sildenafil, Tadalafil. Oral contraceptives: Mifepristone, Norgestril, Levonorgestrol Corticosteroids: Cortisone, Hydrocortisone, Prednisolone, Betamethasone, Dexamethasone Thyroid and antithyroid drugs: L-Thyroxine, L-Thyronine,	**08 Hours**	**17.77%**

Sr. No.	UNIT	Hours	Weightage (%)
	Propylthiouracil, Methimazole.		
5.	**Antidiabetic agents:** Insulin and its preparations Sulfonyl ureas: Tolbutamide*, Chlorpropamide, Glipizide, Glimepiride. Biguanides: Metformin. Thiazolidinediones: Pioglitazone, Rosiglitazone. Meglitinides: Repaglinide, Nateglinide. Glucosidase inhibitors: Acrabose, Voglibose. 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, Diperodon, Dibucaine.*	**07 Hours**	**15.55%**

Recommended Books (Latest Editions)

1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry.
2. Foye's Principles of Medicinal Chemistry.
3. Burger's Medicinal Chemistry, Vol I to IV.
4. Introduction to principles of drug design- Smith and Williams.
5. Remington's Pharmaceutical Sciences.
6. Martindale's extra pharmacopoeia.
7. Organic Chemistry by I.L. Finar, Vol. II.
8. The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1to 5.
9. Indian Pharmacopoeia.
10. Text book of practical organic chemistry- A.I.Vogel.

Subject Code: BP502T	**Subject Title: Industrial Pharmacy-I (Theory)**
Pre-requisite: --	

Scope: Course enables the student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product.

Course Objective: Upon completion of this course, the students would be able to

1. Know the various pharmaceutical dosage forms and their manufacturing Techniques
2. Know various considerations in development of pharmaceutical dosage forms
3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			**Total**
Lecture	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	**UNIT**	**Hours**	**Weightage (%)**
1.	**Preformulation Studies:** Introduction to preformulation, goals and objectives, study of physicochemical characteristics of drug substances. **a. Physical properties:** Physical form (crystal & amorphous), particle size, shape, flow properties, solubility profile (pKa, pH, partition coefficient), polymorphism **b. Chemical Properties:** Hydrolysis, oxidation, reduction, racemisation, polymerization BCS classification of drugs & its significant. Application of preformulation considerations in the development of solid, liquid oral and parenteral dosage forms and its impact on stability of dosage forms.	**07 Hours**	**15.55%**
2.	**Tablets:** a. Introduction, ideal characteristics of tablets, classification of tablets. Excipients, Formulation of tablets, granulation methods, compression and processing problems. Equipments and tablet tooling. b. Tablet coating: Types of coating, coating materials, formulation of coating composition, methods of coating, equipment employed and defects in coating. c. Quality control tests: In process and finished product tests **Liquid orals:** Formulation and manufacturing consideration of syrups and elixirs suspensions and emulsions; Filling and packaging; evaluation of liquid orals official in pharmacopoeia	**10 Hours**	**22.22%**

Sr. No.	UNIT	Hours	Weightage (%)
3.	**Capsules:** **a. Hard gelatin capsules:** Introduction, Production of hard gelatin capsule shells. Size of capsules, Filling, finishing and special techniques of formulation of hard gelatin capsules, manufacturing defects. In process and final product quality control tests for capsules. **b. Soft gelatin capsules:** Nature of shell and capsule content, size of capsules, importance of base adsorption and minim/gram factors, production, in process and final product quality control tests. Packing, storage and stability testing of soft gelatin capsules and their applications. **Pellets:** Introduction, formulation requirements, pelletization process, equipments for manufacture of pellets	**8 Hours**	**17.77 %**
4.	**Parenteral Products:** a. Definition, types, advantages and limitations. Preformulation factors and essential requirements, vehicles, additives, importance of isotonicity b. Production procedure, production facilities and controls, aseptic processing c. Formulation of injections, sterile powders, large volume parenterals and lyophilized products. d. Containers and closures selection, filling and sealing of ampoules, vials and infusion fluids. Quality control tests of parenteral products. **Ophthalmic Preparations:** Introduction, formulation considerations; formulation of eye drops, eye ointments and eye lotions; methods of preparation; labeling, containers; evaluation of ophthalmic preparations	**10 Hours**	**22.22%**
5.	**Cosmetics:** Formulation and preparation of the following cosmetic preparations: lipsticks, shampoos, cold cream and vanishing cream, tooth pastes, hair dyes and sunscreens. Pharmaceutical **Aerosols:** Definition, propellants, containers, valves, types of aerosol systems; formulation and manufacture of aerosols; Evaluation of aerosols; Quality control and stability studies. **Packaging Materials Science:** Materials used for packaging of pharmaceutical products, factors influencing choice of containers, legal and official requirements for containers, stability aspects of packaging materials, quality control tests.	**10 Hours**	**22.22%**

Subject Code: BP502P	Subject Title: Industrial Pharmacy-I (Practical)
Pre-requisite: --	

Teaching Scheme (Hours per week)		Evaluation Scheme (Marks)			
		Practical			
Practical	Credit	University Assessment	Continuous Assessment	Internal Assessment	Total
4	2	35	5	10	50

List of Practical:

Sr. No.	Title of the Experiments
1	Preformulation studies on paracetamol/asparin/or any other drug
2	Preparation and evaluation of Paracetamol tablets
3	Preparation and evaluation of Aspirin tablets
4	Coating of tablets- film coating of tables/granules
5	Preparation and evaluation of Tetracycline capsules
6	Preparation of Calcium Gluconate injection Preparation of Calcium Gluconate injection
7	Preparation of Ascorbic Acid injection
8	Quality control test of (as per IP) marketed tablets and capsules
9	Preparation of Eye drops/ and Eye ointments
10	Preparation of Creams (cold / vanishing cream)
11	Evaluation of Glass containers (as per IP)

Recommended Books: (Latest Editions)

1. Pharmaceutical dosage forms - Tablets, volume 1 -3 by H.A. Liberman, Leon Lachman &J.B.Schwartz
2. Pharmaceutical dosage form - Parenteral medication vol- 1&2 by Liberman & Lachman
3. Pharmaceutical dosage form disperse system VOL-1 by Liberman & Lachman
4. Modern Pharmaceutics by Gilbert S. Banker & C.T. Rhodes, 3rd Edition
5. Remington: The Science and Practice of Pharmacy, 20th edition Pharmaceutical Science (RPS) 6.
6. Theory and Practice of Industrial Pharmacy by Liberman & Lachman
7. Pharmaceutics- The science of dosage form design by M.E.Aulton, Churchill livingstone, Latest edition
8. Introduction to Pharmaceutical Dosage Forms by H. C.Ansel, Lea &Febiger, Philadelphia, 5thedition, 2005
9. Drug stability - Principles and practice by Cartensen & C.J. Rhodes, 3rd Edition, Marcel Dekker Series, Vol 107.

Subject Code: BP503T	Subject Title: Pharmacology-II (Theory)
Pre-requisite: --	

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 Objective: Upon completion of this course, the students would be able to

1. Understand the mechanism of drug action and its relevance in the treatment of different diseases
2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
3. Demonstrate the various receptor actions using isolated tissue preparation
4. Appreciate correlation of pharmacology with related medical sciences

Teaching Scheme (Hours per week)			Evaluation Scheme (Marks)			
			Theory			Total
Lecture	Tutorial	Credit	University Assessment	Continuous Assessment	Internal Assessment	
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	UNIT	Hours	Weightage (%)
1.	**Pharmacology of drugs acting on cardio vascular system** a. Introduction to hemodynamic and electrophysiology of heart. b. Drugs used in congestive heart failure c. Anti-hypertensive drugs. d. Anti-anginal drugs. e. Anti-arrhythmic drugs. f. Anti-hyperlipidemic drugs.	**10 Hours**	**22.22%**
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 **2. Pharmacology of drugs acting on urinary system** a. Diuretics b. Anti-diuretics.	**10 Hours**	**22.22%**
3.	**Autocoids and related drugs** a. Introduction to autacoids and classification b. Histamine, 5-HT and their antagonists. c. Prostaglandins, Thromboxanes and Leukotrienes.	**10 Hours**	**22.22 %**

Sr. No.	UNIT	Hours	Weightage (%)
	d. Angiotensin, Bradykinin and Substance P. e. Non-steroidal anti-inflammatory agents f. Anti-gout drugs g. Antirheumatic drugs		
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.	**8 Hours**	**17.77 %**
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	**07 Hours**	**15.55%**

Subject Code: BP503P	Subject Title: Pharmacology-II (Practical)				
Pre-requisite: --					
Teaching Scheme (Hours per week)		Evaluation Scheme (Marks)			
Practical	Credit	Practical			Total
		University Assessment	Continuous Assessment	Internal Assessment	
4	2	35	5	10	50

List of Practical:

Sr. No.	Title of the Experiments
1	Introduction to in-vitro pharmacology and physiological salt solutions.
2	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.
6	Effect of physostigmine and atropine on DRC of acetylcholine using frog rectus abdominis muscle and rat ileum respectively.
7	Bioassay of histamine using guinea pig ileum by matching method.
8	Bioassay of oxytocin using rat uterine horn by interpolation method
9	Bioassay of serotonin using rat fundus strip by three point bioassay
10	Bioassay of acetylcholine using rat ileum/colon by four point bioassay.
11	Determination of PA2 value of prazosin using rat anococcygeus muscle (by Schilds plot method).
12	Determination of PD2 value using guinea pig ileum.
13	Effect of spasmogens and spasmolytics using rabbit jejunum.
14	Anti-inflammatory activity of drugs using carrageenan induced paw-edema model.
15	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, Churchil Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata McGraw-Hill
3. Goodman and Gilman's, 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 and Perper M.M. Lippincott's Illustrated Reviews Pharmacology
6. K.D.Tripathi. 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. Modern Pharmacology with clinical Applications, by Charles R.Craig& Robert
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan

Subject Code: BP504T	Subject Title: Pharmacognosy and Phytochemistry II (Theory)
Pre-requisite: --	

Scope: The main purpose of subject is to impart the students the knowledge of how the secondary metabolites are produced in the crude drugs, how to isolate and identify and produce them industrially. Also this subject involves the study of producing the plants and phytochemicals through plant tissue culture, drug interactions and basic principles of traditional system of medicine.

Course Objectives: Upon completion of the subject student shall be able to

1. to know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
2. to understand the preparation and development of herbal formulation
3. to understand the herbal drug interactions
4. to carryout isolation and identification of phytoconstituents

Teaching Scheme (Hours per week)			Evaluation Scheme (Marks)			
			Theory			
Lectures	Tutorial	Credit	University Assessment	Continuous Assessment	Internal Assessment	Total
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	UNIT	Hours	Weightage (%)
1.	**Metabolic pathways in higher plants and their determination** a) Brief study of basic metabolic pathways and formation of different secondary metabolites through these pathways- Shikimic acid pathway, Acetate pathways and Amino acid pathway. b) Study of utilization of radioactive isotopes in the investigation of Biogenetic studies.	**7 Hours**	**15.55%**
2.	General introduction, composition, chemistry & chemical classes, biosources, therapeutic uses and commercial applications of following secondary metabolites: **Alkaloids:** Vinca, Rauwolfia, Belladonna, Opium, **Phenylpropanoids and Flavonoids:** Lignans, Tea, Ruta **Steroids, Cardiac Glycosides & Triterpenoids:** Liquorice, Dioscorea, Digitalis **Volatile oils:** Mentha, Clove, Cinnamon, Fennel, Coriander, **Tannins:** Catechu, Pterocarpus **Resins:** Benzoin, Guggul, Ginger, Asafoetida, Myrrh, Colophony **Glycosides:** Senna, Aloes, Bitter Almond **Iridoids, Other terpenoids & Naphthaquinones:** Gentian,	**14 Hours**	**31.11%**

Sr. No.	UNIT	Hours	Weightage (%)
	Artemisia, taxus, carotenoids		
3.	Isolation, Identification and Analysis of Phytoconstituents a) Terpenoids: Menthol, Citral, Artemisin b) Glycosides: Glycyrhetinic acid & Rutin c) Alkaloids: Atropine,Quinine,Reserpine,Caffeine d) Resins: Podophyllotoxin, Curcumin	**6 Hours**	**13.33%**
4.	Industrial production, estimation and utilization of the following phytoconstituents: Forskolin, Sennoside, Artemisinin, Diosgenin, Digoxin, Atropine, Podophyllotoxin, Caffeine, Taxol, Vincristine and Vinblastine	**10 Hours**	**22.22%**
5.	**Basics of Phytochemistry** Modern methods of extraction, application of latest techniques like Spectroscopy, chromatography and electrophoresis in the isolation, purification and identification of crude drugs.	**8 Hours**	**17.77%**

Subject Code: BP504P	Subject Title: Pharmacognosy and Phytochemistry II (Practical)
Pre-requisite: --	

Teaching Scheme (Hours per week)		Evaluation Scheme (Marks)			
		Practical			
Practical	Credit	University Assessment	Continuous Assessment	Internal Assessment	Total
4	2	35	5	10	50

List of Practical:

Sr. No.	Title of the Experiments
1.	Morphology, histology and powder characteristics & extraction & detection of: Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander
2.	Exercise involving isolation & detection of active principles a. Caffeine - from tea dust. b. Diosgenin from Dioscorea c. Atropine from Belladonna d. Sennosides from Senna
3.	Separation of sugars by Paper chromatography
4.	TLC of herbal extract
5.	Distillation of volatile oils and detection of phytoconstitutents by TLC
6.	Analysis of crude drugs by chemical tests: (i) Asafoetida (ii) Benzoin (iii) Colophony (iv) Aloes (v) Myrrh

Recommended Books: (Latest Editions)

1. W.C.Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Sounders & Co., London, 2009.
2. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
3. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37th Edition, Nirali Prakashan, New Delhi.
4. Herbal drug industry by R.D. Choudhary (1996), Ist Edn, Eastern Publisher, New Delhi.
5. Essentials of Pharmacognosy, Dr.SH.Ansari, IInd edition, Birla publications, New Delhi, 2007
6. Herbal Cosmetics by H.Pande, Asia Pacific Business press, Inc, New Delhi.
7. A.N. Kalia, Textbook of Industrial Pharmacognosy, CBS Publishers, New Delhi, 2005.
8. R Endress, Plant cell Biotechnology, Springer-Verlag, Berlin, 1994.
9. Pharmacognosy & Pharmacobiotechnology. James Bobbers, Marilyn KS, VE Tylor.
10. The formulation and preparation of cosmetic, fragrances and flavours.
11. Remington's Pharmaceutical sciences.
12. Text Book of Biotechnology by Vyas and Dixit.
13. Text Book of Biotechnology by R.C. Dubey

Subject Code: BP505T	Subject Title: Pharmaceutical Jurisprudence (Theory)
Pre-requisite: --	

Scope: This course is designed to impart basic knowledge on important legislations related to the profession of pharmacy in India

Course Objective: Upon completion of the course student shall be able to

1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals
2. Various Indian pharmaceutical Acts and Laws
3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
4. The code of ethics during the pharmaceutical practice

Teaching Scheme (Hours per week)			Evaluation Scheme (Marks)			
			Theory			Total
Lecture	Tutorial	Credit	University Assessment	Continuous Assessment	Internal Assessment	
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	UNIT	Hours	Weightage (%)
1.	**Drugs and Cosmetics Act, 1940 and its rules 1945:** Objectives, Definitions, Legal definitions of schedules to the Act and Rules Import of drugs – Classes of drugs and cosmetics prohibited from import, Import under license or permit. Offences and penalties. Manufacture of drugs – Prohibition of manufacture and sale of certain drugs, Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license.	**10 Hours**	**22.22%**
2.	**Drugs and Cosmetics Act, 1940 and its rules 1945.** Detailed study of Schedule G, H, M, N, P,T,U, V, X, Y, Part XII B, Sch F & DMR (OA) Sale of Drugs – Wholesale, Retail sale and Restricted license. Offences and penalties Labeling & Packing of drugs- General labeling requirements and specimen labels for drugs and cosmetics, List of permitted colors. Offences and penalties. Administration of the Act and Rules – Drugs Technical Advisory Board, Central drugs Laboratory, Drugs Consultative Committee, Government drug	**10 Hours**	**22.22%**

Sr. No.	UNIT	Hours	Weightage (%)
	analysts, Licensing authorities, controlling authorities, Drugs Inspectors		
3.	• **Pharmacy Act –1948:** Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils; constitution and functions, Registration of Pharmacists, Offences and Penalties • **Medicinal and Toilet Preparation Act –1955:** Objectives, Definitions, Licensing, Manufacture In bond and Outside bond, Export of alcoholic preparations, Manufacture of Ayurvedic, Homeopathic, Patent & Proprietary Preparations. Offences and Penalties. • **Narcotic Drugs and Psychotropic substances Act-1985 and Rules:** Objectives, Definitions, Authorities and Officers, Constitution and Functions of narcotic & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and Regulation, opium poppy cultivation and production of poppy straw, manufacture, sale and export of opium, Offences and Penalties	**10 Hours**	**22.22%**
4.	• **Study of Salient Features of Drugs and Magic Remedies Act and its rules:** Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties • **Prevention of Cruelty to animals Act-1960:** Objectives, Definitions, Institutional Animal Ethics Committee, CPCSEA guidelines for Breeding and Stocking of Animals, Performance of Experiments, Transfer and acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties • **National Pharmaceutical Pricing Authority:** Drugs Price Control Order (DPCO)- 2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, National List of EssentialMedicines (NLEM)	**8 Hours**	**17.77%**
5.	• **Pharmaceutical Legislations** – A brief review, Introduction, Study of drugs enquiry committee, Health survey and development committee, Hathi committee and Mudaliar committee	**7 Hours**	**15.55%**

Sr. No.	UNIT	Hours	Weightage (%)
	• **Code of Pharmaceutical ethics:** Definition, Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath • **Medical Termination of Pregnancy Act** • **Right to Information Act** • **Introduction to Intellectual Property Rights (IPR)**		

Recommended Books (Latest Editions)

1. Forensic Pharmacy by B. Suresh 123
2. Text book of Forensic Pharmacy by B.M. Mithal
3. Hand book of drug law-byM.L. Mehra
4. A text book of Forensic Pharmacy by N.K. Jain
5. Drugs and Cosmetics Act/Rules by Govt. of India publications.
6. Medicinal and Toilet preparations act 1955 by Govt. of India publications.
7. Narcotic drugs and psychotropic substances act by Govt. of India publications
8. Drugs and Magic Remedies act by Govt. of India publication
9. Bare Acts of the said laws published by Government. Reference books (Theory)

Subject Code: BP506T	Subject Title: Contributor Personality Development Program (Theory)
Pre-requisite: --	

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.

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 Objective:

Sr. No.	CO statement	Marks % weightage
Outcome of theory sessions		
CO-1	Students will be able to recognize & appreciate two alternative ideals of work – ideal of a "worker" and ideal of a "contributor". And why organizations of today expect people they employ to be contributors and not just workers.	10-12%

CO-2	Students will be able to recognize & appreciate alternative ways in which they could define themselves or "who am I" (their identity) – and which are positive identities that will lead to building intrinsic self-esteem and confidence in oneself; in contrast to identities that will lead to extrinsic self-esteem that makes them more dependent on their environment.	10-12%
CO-3	Students will be able to recognize & appreciate a "victim" stance as distinct from a "creator of destiny" stance in the way people approach challenges and situations; and how the latter frees individuals to take on challenges and open up opportunities.	10-12%
CO-4	Students will be able to differentiate between two alternative approaches to success - 'building one's engine of success' and 'chasing the fruits of success'; they also appreciate the payoffs/ consequences of both and which is more likely to lead to sustainable or lasting success in the long run.	10-12%
CO-5	Students will be able to recognize & appreciate different career models and their value; to help them make more informed career-related choices.	10-12%
CO-6	Students will be able to recognize & appreciate how one can expand the contribution possible in any role, thereby opening up an alternative way of career growth to them.	10-12%
Outcome of practical sessions		
CO-7	Students learn to re-interpret their life and college experiences to showcase their contribution affinities which are relevant for employers.	15%
CO-8	Students learn to apply contributor thinking to real-world or career relevant challenges.	15%

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			**Total**
Lecture	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
4	0	4	75	10	15	100

Detailed Syllabus:

Sr. No.	UNIT	Hours	Weightage (%)
1.	**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	5 Hours	8.33%
2.	**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.	5 Hours	8.33%
3.	**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 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.	5 Hours	8.33%
4.	**Achieving Sustainable Success** In this topic, students discover how to achieve sustainable or lasting success, by building one's "engine of success", making them successworthy. 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	5 Hours	8.33%

	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.		
5.	**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.	**5 Hours**	**8.33%**
6.	**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.	**5 Hours**	**8.33%**
7.	**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.	**5 Hours**	**8.33%**
8.	**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	**5 Hours**	**8.33%**

	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.		
9.	**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.	**5 Hours**	**8.33%**
10.	**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").	**5 Hours**	**8.33%**
11.	**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.	**5 Hours**	**8.33%**
12.	**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.	**5 Hours**	**8.33%**

Subject Code: BP506P	Subject Title: Contributor Personality Development Program (Practical)
Pre-requisite: --	

Course Objective:

Sr. No.	CO statement	Marks % weightage
Outcome of practical sessions		
CO-7	Students learn to re-interpret their life and college experiences to showcase their contribution affinities which are relevant for employers.	15%
CO-8	Students learn to apply contributor thinking to real-world or career relevant challenges.	15%

A. Basic reference for both students and teachers

1. Contributor Personality Program textbook cum workbook developed by Illumine

2. Web-based ActivGuideTM for self-exploration of rich media resources to vividly understand many of the ideas, watch role models, learn from industry people, get reference readings – that help them enrich the understanding they gained in the class published by Illumine Foundation

B. Advanced reference for teachers

1. On Contributors, Srinivas V.; Illumine Ideas, 2011

2. Enlightened Citizenship and Democracy; Swami Ranganathananda, Bharatiya Vidya Bhavan, 1989.

3. Eternal Values for a Changing Society – Vol I-IV, Swami Ranganathananda; Bharatiya Vidya Bhavan

4. Karma Yoga, Swami Vivekananda; Advaita Ashrama

5. Vivekananda: His Call to the Nation, Swami Vivekananda; Advaita Ashrama

6. Six Pillars of Self Esteem, Nathaniel Branden; Bantam, 1995

7. Mindset: The New Psychology of Success, Carol S. Dweck; Random House Publishing Group, 2007

8. Lasting Contribution: How to Think, Plan, and Act to Accomplish Meaningful Work, Tad Waddington; Agate Publishing, 2007

9. Why not?: how to use everyday ingenuity to solve problems big and small, Barry Nalebuff, Ian Ayres; Harvard Business School Press, 2003

10. The value mindset: returning to the first principles of capitalist enterprise (Ch 8 & 9. Erik Stern, Mike Hutchinson; John Wiley and Sons, 2004

11. The Power of Full Engagement: Managing Energy, Not Time, is the Key to High Performance and Personal Renewal, Jim Loehr, Tony Schwartz; Simon and Schuster, 2003

12. Creating Shared Value, Michael E. Porter and Mark R. Kramer; Harvard Business Review; Jan/Feb2011, Vol. 89 Issue 1/2

13. The Speed of Trust: The One Thing That Changes Everything, Stephen M. R. Covey, Rebecca R. Merrill, Stephen R. Covey; Free Press, 2008

14. The Courage to Meet the Demands of Reality, Henry Cloud; HarperCollins, 2009

15. Responsibility at work: how leading professionals act (or don't act) responsibly, Howard Gardner; John Wiley & Sons, 2007