



VISWAMBHARA EDUCATIONAL SOCIETY
VAAGDEVI COLLEGE OF PHARMACY

(Approved by AICTE & PCI, New Delhi & affiliated to Kakatiya University, Warangal, T.S)
Ramnagar Dist. Hanumakonda- 506001, (T.S)

Subject: Pharmaceutical analysis-I

Program Name: B. Pharmacy

Year/Sem: I-SEM

Theory/Lab: Theory


LESSON PLAN		
S.NO	Topics to be covered	Hours Required
UNIT -I		
1.	Pharmaceutical analysis- Scope- a) Techniques of analysis b) Expressing concentration c) Preparation and standardization of molar and normal solutions	3
2.	Errors- Sources, types, methods of minimizing errors, precision and significant figures	3
3.	Pharmacopoeia, sources of impurities in medicinal agents	2
UNIT -II		
1.	Acid-Base Titration Acid base indicators, acid base titrations	3
2.	Titrations involved in strong, weak and very weak acids and bases	3
3.	Neutralization curves	2
4.	Non-aqueous titrations Solvents, acidimetry and alkalimetry	3
5.	Estimation of sodium benzoate and ephedrine HCL	2
UNIT -III		
1.	Precipitation titrations Mohr's, volhard's, modified volhard's, fajan's methods	2
2.	Estimation of sodium chloride	1
3.	Complexometric titrations Classification, metal ion indicators, masking and demasking agents	2
4.	Estimation of magnesium sulphate and calcium gluconate	2
5.	Gravimetry Principle, steps involved in gravimetric analysis	2
6.	Co-precipitation and post precipitation, estimation of barium sulphate	2
7.	Basic principles and methods and applications of diazotization titrations	2
UNIT -IV		
1.	Redox titrations	2



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	Concepts of Oxidation and reduction	
2.	Types of redox titrations (principles and applications) cerometry, iodometry and iodimetry, bromatometry, dichrometry	3
	UNIT -V	
1.	Electro chemical method of analysis Conductometry- conductivity cell, titrations and applications	3
2.	Potentiometry- Electrochemical cell, construction and working of reference & indicator electrodes	3
3.	Method to determine end point of potentiometric titrations and applications	2
4.	Polarography Principle, Ilkovic's equation, construction and working of dropping mercury electrode & rotating platinum electrode	3




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Subject: Social and Preventive Pharmacy

Program Name: B. Pharmacy

Year/Sem: VIII-SEM

Theory/Lab: Theory

LESSON PLAN		
S.NO	Topics to be covered	Hours Required
UNIT -I		
1.	Definition, concepts and evaluation of public health. Understanding the concept of prevention and control of disease	2
2.	social causes of diseases and social problems of the sick	2
3.	Food in relation to nutrition and health, Balanced diet	2
4.	Food in relation to Nutritional deficiencies, Vitamin deficiencies, Malnutrition and its prevention.	2
5.	Socio cultural factors related to health and disease, Impact of urbanization on health and disease, Poverty and health	2
6.	Personal hygiene and health care; avoidable habits	1
UNIT -II		
1.	Pharmaco dynamics- Principles and mechanisms of drug action. Receptor theories and classification of receptors, regulation of receptors.	2
2.	SARS, Ebola virus, influenza, acute respiratory infections, malaria, chicken guinea, dengue,	3
3.	lymphatic filariasis, pneumonia	2
4.	hypertension, diabetes mellitus	2
5.	Cancer	2
6.	drug addiction-drug substance abuse	1
UNIT -III		
1.	National health programs, its objectives, functioning and outcome of HIV AND AIDS control programme	2
2.	National health programs, its objectives, functioning and outcome of TB, Integrated disease surveillance program (IDSP)	2
3.	National health programs, its objectives, functioning and outcome of National leprosy control programme	2
4.	National mental health program, National programme for prevention and control of deafness	2
5.	Universal immunization programme	2
6.	National programme for control of blindness	1
7.	National programme for control of Pulse polio programme	1



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UNIT -IV		
1.	National health intervention programme for mother and child	2
2.	National family welfare Programme	1
3.	National tobacco control Programme	1
4.	National Malaria Prevention Program	1
5.	National Programme for the health care for the elderly, Social health programme	2
6.	Role of WHO in Indian national program	1
UNIT -V		
1.	Community services in rural, urban and school health	1
2.	Functions of PHC Improvement	1
3.	National urban health mission	1
4.	Health promotion education in School	1
5.	Health promotion in School	1




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Subject: Pharmacology –II

Program Name: Pharm.D

Year/Sem: Third Year

Theory/Lab: Theory

LESSON PLAN		
S.NO	Topics to be covered	Hours Required
UNIT -I		
1.	Pharmacology of Drugs acting on Blood and blood forming agents Anticoagulants	2
2.	Pharmacology of Drugs acting on Blood and blood forming agents Thrombolytics and antiplatelet agents	2
3.	Pharmacology of Drugs acting on Blood and blood forming agents Haemopoietics and plasma expanders	2
UNIT -II		
1.	Pharmacology of drugs acting on Renal System a) Diuretics	2
2.	Pharmacology of drugs acting on Renal System b) Antidiuretics	2
UNIT –III		
1.	Chemotherapy a) Introduction b) Sulfonamides and co-trimoxazole	2
2.	Penicillins and Cephalosporins	2
3.	Tetracyclins and Chloramphenicol Macrolides, Aminoglycosides, Polyene & Polypeptide antibiotics Quinolines and Fluroquinolines	4
4.	Antifungal antibiotics Antiviral agents Chemotherapy of tuberculosis and leprosy	4
5.	Chemotherapy of Malaria Chemotherapy of protozoal infections (amoebiasis, Giardiasis) Pharmacology of Anthelmintic drugs Chemotherapy of cancer (Neoplasms)	4



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UNIT -IV		
1.	Pharmacology of immunosuppressants	2
2.	Immunopharmacology Pharmacology of stimulants	3
UNIT -V		
1.	Principles of Animal toxicology Acute, sub acute	2
2.	Principles of Animal toxicology, chronic toxicity	2
UNIT -VI		
1.	Cell and macromolecules: Cellular classification, subcellular organelles, macromolecules, large macromolecular assemblies	3
2.	Chromosome structure: Pro and eukaryotic chromosome structures, chromatin structure, genome complexity, the flow of genetic information	3
3.	DNA replication: General, bacterial and eukaryotic DNA replication.	2
4.	The cell cycle: Restriction point, cell cycle regulators and modifiers.	2
5.	Cell signaling: Communication between cells and their environment, ion-channels, signal transduction pathways	3
6.	Gene structure: Organization and elucidation of genetic code.	2
7.	Gene expression: Expression systems (pro and eukaryotic), genetic elements that control gene expression	3
8.	Transcription and Transcription factors: Basic principles of transcription in pro and eukaryotes	3
9.	Transcription factors that regulate transcription in pro and eukaryotes.	2
10.	RNA processing: rRNA, tRNA and mRNA processing.	2
11.	Protein synthesis: Mechanisms of protein synthesis, initiation in eukaryotes, translation control and post-translation events	3
12.	Altered gene functions: Mutations, deletions, amplifications, LOH, traslocations, trinucleotide repeats and other genetic abnormalities.	3
13.	Oncogenes and tumor suppressor genes.	2




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Subject: Human Anatomy and Physiology


Program Name: Pharm.D

Year/Sem: First Year

Theory/Lab: Theory


LESSON PLAN		
S.NO	Topics to be covered	Hours Required
UNIT -I		
1.	Scope of anatomy and physiology	1
2.	Levels of Structural Organization and Body Systems	1
3.	Basic Anatomical Terminology	1
UNIT -II		
1.	Structure of cell – its components and their functions	2
2.	The processes that transport substances across the plasma membrane	1
UNIT -III		
1.	The structure and functions of the five main types of cell junctions	2
2.	Epithelial tissues	2
3.	Connective tissues	1
4.	Muscular tissues and Nervous tissue	1
UNIT -IV		
1.	Bone Tissue	2
2.	Axial System	2
3.	Apppendicular system	2
4.	Classification and Types of Movements of Joints	2
5.	Disorders of joints	1
UNIT -V		
1.	Functions and Properties of Blood	1
2.	Formation, Anatomy and Physiology of Blood Cells- RBC, WBC and platelets	2
3.	Hemostasis- Vascular Spasm; Platelet Plug Formation; Mechanism and factors effecting blood clotting	2
4.	Blood groups and their significance	1
5.	Disorders of platelets and coagulation, Definitions of Disorders of Blood components	2
UNIT -VI		
1.	Structure and functions of lymphatic system- Lymphatic Vessels and Lymph Circulation.	2
2.	Lymphatic Organs and Tissues-thymus, lymph nodes, spleen, lymph nodules, MALT	3
3.	Disorders of lymph and lymphatic system	2




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UNIT -VII		
1.	Overview of CVS	1
2.	Anatomy and functions of heart and heart valves	2
3.	Circulation of Blood (Pulmonary, coronary and systemic circulation)	2
4.	Electrocardiogram and its Correlation to Conduction system Heart Auscultations	2
5.	Cardiac muscle tissue and cardiac conduction system	1
6.	Cardiac cycle and factors affecting it	1
7.	Cardiac output and factors affecting it	1
8.	Structure of Blood Vessels	1
9.	Blood pressure – its maintenance and regulation	2
10.	Definition of the following disorders: Hypertension, Hypotension, Arteriosclerosis, Atherosclerosis, Angina, Myocardial infarction, Congestive heart failure, Cardiac arrhythmias.	2
UNIT -VIII		
1.	Anatomy & Functions of Respiratory Organs	1
2.	Mechanism/Physiology of Respiration- Pulmonary ventilation (mechanism and regulation of Respiration)	2
3.	Exchange and transport of oxygen and carbon dioxide	1
4.	Control of respiration	1
5.	Lung Volumes and Capacities	1
6.	Definition of Hypoxia, Asphyxia, Dibarysim, Oxygen therapy, resuscitation.	1
UNIT -IX		
1.	Overview of the Digestive System	1
2.	Layers of the GI Tract Neural Innervation of the GI Tract Anatomy and functions peritoneum	2
3.	Anatomy and functions of Salivary gland, tongue and teeth. Mechanical and Chemical Digestion in the Mouth	2
4.	Anatomy and functions of pharynx	1
5.	Anatomy, Histology and Physiology of esophagus, Deglutination reflex	1
6.	Anatomy and Histology of Stomach, Mechanical and Chemical Digestion in the Stomach.	2
7.	Anatomy and Histology of Pancreas, Composition and Functions of Pancreatic Juice.	1
8.	Anatomy, Histology and Functions of liver & gall bladder.	1
9.	Anatomy and Histology of small intestine, Role of Intestinal Juice and Brush-Border Enzymes, Mechanical, chemical digestion and absorption of food in small intestine.	2
10.	Anatomy and Histology of large intestine, Mechanical, chemical digestion, absorption of food and Feces Formation in large intestine.	1
11.	Different types of GI motility	1
12.	Disorders of GIT	1
UNIT -X		
1.	Overview of Nervous system Classification of nervous system	1
2.	Structure of Neuron and types of neurons	1
3.	Myelination of Neurons	1
4.	Structure and types of neuroglia cells	1
5.	Generation and propagation of Graded Potential and Action Potential	1




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6.	Signal transmission at synapse. Neurotransmitters in CNS.	1
7.	Brain Organization, Protection, and Blood Supply	1
8.	Formation and Functions of CSF	1
9.	Anatomy, physiology and functional areas of cerebrum	1
10.	Anatomy and physiology of cerebellum	1
11.	Anatomy and physiology of mid brain	1
12.	Anatomy and physiology of Thalamus, hypothalamus and Basal Ganglia	1
13.	Classification of Cranial nerves, their origin, innervation, transmission and functions	1
14.	Anatomy and physiology of spinal cord.	1
15.	Classification of Spinal nerves, their origin, innervation, transmission and functions	1
16.	Spinal Arc and Spinal Reflexes	1
17.	Anatomy of Sympathetic and Parasympathetic nervous system	1
18.	ANS Neurotransmitters-Physiological effects of ANS neurotransmitters	1
19.	Deference between Sympathetic and parasympathetic nervous system	1
20.	Autonomic reflexes	1
UNIT -XI		
1.	Overview of Kidney Functions	1
2.	External Anatomy and Histology of the Kidneys	1
3.	External Anatomy and Histology of the nephron	1
4.	Renal Physiology (Physiology of Urine Formation)	1
5.	Renin Angiotensin system- Jextaglomerular apparatus	1
6.	Acid-base balance	1
7.	Clearance tests and micturition	1
UNIT -XII		
1.	Overview of Endocrine system and Endocrine glands	1
2.	Principles of hormone activity	1
3.	Mechanism of hormone action	1
4.	Control of hormone secretion	1
5.	Structure, Secretions & Functions of hypothalamus & pituitary gland.	1
6.	Pituitary hormones, their physiological functions, their control by hypothalamus	2
7.	Anatomy of Thyroid gland. Formation, secretion and regulation of secretion of thyroid hormones and their functions, diseases of the thyroid.	2
8.	Structure and hormone secreted by parathyroid gland. Parathromone and calcitonin, control of calcium metabolism. Abnormalities of Parathromone and calcitonin secretion.	1
9.	Anatomy of Adrenal gland. Adrenocortical hormones, secretion, regulation and functions. Abnormalities of adrenal secretion.	1
10.	Pancreatic islets structure, effects of pancreatic hormones. Abnormalities of pancreatic secretion.	1
UNIT -XIII		
1.	Male reproductive system	1
2.	Female reproductive system	1
3.	Hormones secreted by Reproductive system	1
4.	Physiology of menstruation	1




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5.	Spermatogenesis & Oogenesis	1
6.	Sex determination (genetic basis)	1
7.	Pregnance and maintenance and parturition	1
8.	Contraceptive devices	1
UNIT –XIV		
1.	Olfaction: Sense of Smell (Anatomy of Olfactory receptors, physiology of Olfaction, odor thresholds and adaptation;olfactory pathway).	1
2.	Gustation: Sense of Taste	1
3.	Vision and Disorders of vision	1
4.	Hearing and Equilibrium and disorders of hearing.	1
5.	Skin (Anatomy, Functions and Disorders)	1
UNIT –XV		
1.	Histology of skeletal muscle	1
2.	Physiology of Muscle contraction	1
3.	Physiological properties of skeletal muscle	1
4.	Disorders of skeletal muscle (definitions)	1
UNIT –XVI		
1.	Muscles in exercise, Effect of athletic training on muscles and muscle performance	1
2.	Respiration in exercise, CVS in exercise, Body heat in exercise, Body fluids and salts in exercise,	1
3.	Drugs and athletics	1




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Subject: Pharmacokinetics, Pharmacodynamics & Drug Metabolism (PPDM)
 Program Name: M. Pharmacy
 Year/Sem: First Year/ First Semester
 Theory/Lab: Theory

LESSON PLAN		
S.NO	Topics to be covered	Hours Required
UNIT -I		
1.	Factors affecting drug absorption	1
2.	Gastro intestinal, percutaneous and rectal absorption	2
3.	Absorption kinetics	2
4.	Wagner Nelson & Loo Riegelman methods	2
5.	BCS classification – significance	2
UNIT -II		
1.	Plasma Protein binding – factors affecting plasma protein binding	3
2.	Kinetics of protein binding, use of different plots (Scatchard plots etc.,) in characterizing binding kinetics	3
3.	Tissue binding	1
4.	Transfer of drugs through biological barriers	2
5.	their therapeutic implication in drug action with emphasis on drug transporters.	1
UNIT –III		
1.	Routes of excretion of drugs culture	2
2.	Extensive study of contribution of each route with specific examples	3
3.	The role of kidney excretion	2
4.	factors influencing excretion	2
UNIT -IV		
1.	Factors affecting bioavailability	2
2.	Importance of bioequivalence studies.	2
3.	Conduct of BE studies – Different approaches	2
4.	US FDA, EMEA DCGI guidance on BE studies in fasted	2
5.	fed conditions BE study waivers	4
UNIT -V		
1.	Phase-I and Phase-II metabolic reactions	4
2.	microsomal and non-microsomal biotransformation reactions	2
3.	Drug metabolism in liver	2
4.	kidney, intestine and other extra-hepatic sites	1



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5.	Drug metabolism in placenta	2
6.	fetus, new born and aged	4
UNIT -VI		
1.	Stereochemical, physicochemical and biological factors	2
2.	Physiological and environmental factors, species, strain, sex, and age Differences	2
3.	Pathological states	2
4.	Genetic factors – Introduction to the role of genetics in drug	2
5.	Polymorphism in drug oxidation and other metabolic reactions	2
UNIT -VII		
1.	Revision of basic concepts	2
2.	Dose – response in man	2
3.	Influence of renal and hepatic disease on pharmacokinetics	2
4.	Therapeutic drug monitoring	2
5.	Population pharmacokinetics	2
UNIT -VIII		
1.	Drug receptor interaction dynamics	2
2.	Application of stoichmetry principles	2
3.	Understanding of pharmacokinetics - pharmacodynamic relationships	2
4.	Different pharmacodynamic models: Linear, Emax	2
5.	Biophase distribution	2
6.	Indirect response models.	2



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Subject: Advances in Preclinical Evaluation – II

Program Name: M. Pharmacy

Year/Sem: First Year/ Second Semester

Theory/Lab: Theory

LESSON PLAN		
S.NO	Topics to be covered	Hours Required
UNIT -I		
1.	Basic principles of bioassays	1
2.	Experimental models and statistical designs employed in biological standardization	1
3.	official bioassays, experimental models and statistical designs employed in biological standardization : Acetylcholine, Adrenaline, Digitalis, Heparin, Insulin, d-tubocurarine, Histamine, HCG, Corticotrophine, Vasopressin, oxytocin.	4
4.	Biological standardization of vaccines and sera: Pertussis vaccine, rabies vaccine and Plague vaccine.	2
UNIT -II		
1.	Preclinical evaluation of following categories of drugs. CNS Pharmacology: Sedatives, hypnotics, anxiolytics, antidepressants, Muscle relaxants (Central). CNS stimulations anticonvulsants, antipsychotics, Nootropics, antiparkinsonian agents.	8
2.	Analgesics, antipyretics, anti-inflammatory agents and local anesthetics.	3
3.	Gastrointestinal drugs: Antiulcer agents, laxatives	2
4.	Respiratory pharmacology: bronchodilators, antitussives	3
5.	Diuretics	1
6.	Histamine antagonists	1
7.	Reproductive pharmacology: antifertility agents	1
8.	Anticancer agents	2
UNIT -III		
1.	General requirements for establishing the animal cell culture, media and conditions	2
2.	Methods for cell cultures	2
3.	Applications in Pharmacy	1
UNIT -IV		
1.	Cell-line technique	1
2.	Patch clamp technique	1
3.	In-vitro models for animal screening	3



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4.	Molecular biology techniques	1
UNIT -V		
1.	Concept of transgenic animals, knockout animals, nude animals, receptor binding assays, principles of immunoassay, patch clamp techniques.	5



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Subject: Medicinal Chemistry

Program Name: Pharm.D

Year/Sem: Third Year

Theory/Lab: Theory


LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT -I		
1.	Modern concept of rational drug design: QSAR	2
2.	Prodrug	2
3.	Combinatorial Chemistry	2
4.	CADD	3
5.	Antisense Molecules	1
UNIT -II		
1.	Anti infective agents : Local anti infective agents	2
2.	Preservatives	2
3.	Antifungal agents	3
4.	Urinary tract anti infective agents	3
5.	Anti tubercular agents	2
6.	Anti viral and anti AIDS agents	3
7.	Antiprotozoal agents	2
8.	Anthelmintics	2
9.	Antiscabies and antipedicular agents	2
UNIT -III		
1.	Sulphonamide and sulphones	3
UNIT -IV		
1.	Antimalarials	3
UNIT -V		
1.	Antibiotics	4
UNIT -VI		
1.	Antineoplastic agnts	4
UNIT -VII		
1.	Cardiovascular agents: Antihypertensive agents	3
2.	Antianginal and vasodilator agents	3
3.	Antiarrhythmic agents	3
4.	Antihyperlipidemic agents	3
5.	Coagulants and anticoagulants	2



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6.	Endocrine	2
	UNIT -VIII	
1	Hypoglycemic agents	3
	UNIT -IX	
1.	Thyroid and antithyroid agents	3
	UNIT -X	
1.	Diuretics	3
	UNIT -XI	
1.	Diagnostic agents	2
	UNIT -XII	
1.	Steroidal hormones and Adrenocorticoids	3




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Subject: Pharmaceutical Organic Chemistry

Program Name: Pharm.D

Year/Sem: First Year

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT -I		
1.	Structures and Physical Properties : Polarity of bonds, polarity of molecules	1
2.	M.P, Inter molecular forces, B.P, Solubility	2
3.	Non ionic solutes and ionic solutes	1
4.	Protic and aprotic solvents, ion pairs	1
5.	Acids and bases, Lowry bronsted and Lewis Theories	2
6.	Isomerism	2
UNIT -II		
1.	Nomenclature of organic compounds : Alkanes, Alkenes, Dienes, Alkynes	2
2.	Carboxylic Acid, Esters, Acid Chlorides, Acid amides	1
3.	Aldehydes, Ketones, Amines, Alcohols, Phenols	1
4.	Alkyl halides, Cycloalkanes	1
UNIT -III		
1.	Free radicals chain reactions of alkane : Free radical mechanism	2
2.	Relative reactivity of free radicals	1
3.	Stability of free radicals	1
UNIT -IV		
1.	Alicyclic compounds : Preparations of cyclo alkanes	1
2.	Bayer strain theory	1
3.	Orbital picture of angle strain	1
UNIT -V		
1.	Nuclophilic aliphatic Substitution : Nucleophiles and leaving groups	1
2.	Mechanism & kinetics of SN ₂ reactions	2
3.	Mechanism & kinetics of SN ₁ reactions	2
4.	Stereochemistry and steric hindrance, role of solvents, phase transfer catalysis of SN ₂ reactions	2
5.	Stereochemistry and steric hindrance, role of	2



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	solvents, phase transfer catalysis of SN ₁ reactions	
6.	SN ₂ versus SN ₁	1
	UNIT -VI	
1.	Dehydro halogenations of alkyl halides : 1,2 elimination, kinetics	1
2.	E2 and E1 mechanism	2
3.	Elimination via carbocation, evidence for E2 mechanism, absence of rearrangement, isotope effect, absence hydrogen exchange, the element effect, orientation and reactivity	3
4.	E2 versus E1	1
5.	Elimination versus substitution	1
6.	Dehydration of alcohol, ease of dehydration, acid catalysis, reversibility, orientation	1
	UNIT -VII	
1.	Electrophilic and free radicals addition: Reactions at carbon-carbon single bond and double bond, electrophiles	1
2.	Hydrogenation, heat of hydrogenation and stability of alkenes	1
3.	Markownikoff rule, addition of hydrogen halides	2
4.	Addition of hydrogen bromides, peroxide effect	1
5.	Electrophilic addition, mechanism, rearrangement, absence of hydrogen exchange, orientation and reactivity	2
6.	Addition of halogen, mechanism, halohydrin formation	1
7.	Mechanism of free radical addition reaction	1
8.	Mechanism of peroxide initiated addition of hydrogen bromide, orientation of free addition	1
9.	Additions of carbene to alkene, cyclo addition Reactions	1
	UNIT -VIII	
1.	Free radical substitution reactions: Carbon-carbon double bond as substituents	1
2.	Free radical halogenations of alkenes	3
3.	Comparison of free radical substitution with free radical addition	1
4.	Free radical substitution in alkenes, orientation and reactivity, allylic rearrangements	1
	UNIT -IX	
1.	Theory of resonance : Allyl radical as a resonance hybrid	1
2.	Stability, orbital picture, resonance stabilization of allyl radicals	2
3.	Hyper conjugation, Nucleophilic substitution in allylic substrate	1
4.	SN ₁ reactivity, allylic rearrangement, resonance stabilization of allyl cation	1
5.	SN ₂ nucleophilic substitution in vinylic substrate	1
	UNIT -X	
1.	Electrophilic aromatic Substitution: Mechanism, Orientation and relative	2



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	reactivity	
2.	Substituent groups and its effects	1
3.	Nitration, sulphonation, halogenation, friedel craft alkylation, friedel craft acylation	2
4.	Activating and deactivating O,P,M directing groups	2
5.	Effect of halogen on electrophilic aromatic substitution in alkyl benzene	1
6.	Side chain halogenation of alkyl benzene, resonance stabilization of benzyl radical	1
UNIT -XI		
1.	Nucleophilic addition Reaction: Mechanism of nucleophilic addition reaction	1
2.	Acidity of carboxylic acids	1
3.	Ionization of carboxylic acids, acidity constants	1
4.	Structure of carboxylate ions, effect of substituent on acidity	1
5.	Nucleophilic acyl substitution reaction	1
6.	Conversion of acid to acid chloride, esters, amide and anhydride	1
7.	Role of caboxyl group, comparison of alkyl nucleophilic substitution with acyl nucleophilic substitution	1
UNIT -XII		
1.	Named reactions : Aldol condensation and crossed aldol condensation	1
2.	Cannizzaro reaction and crossed cannizzaro Reaction	1
3.	Claisen condensation and benzoin condensation	1
4.	Perkin condensation, knoevenagel, reformatsky Reaction	1
5.	Wittig reaction, michael addition	1
UNIT -XIII		
1.	Amines & phenols : Basicity of amines, Preparation of amine-Hoffmann rearrangement reaction	2
2.	Diazotisation and coupling reactions	2
3.	Acidity of phenols	1
4.	Williamson synthesis, Fries rearrangement	1
5.	Kolbe reaction, Reimer tieman's reactions	1
UNIT -IV		
1.	Nucleophilic aromatic substitution reactions : Bimolecular displacement mechanisms & Orientation	1
2.	Comparison of aliphatic nucleophilic substitution with that of aromatic	1
UNIT -V		
1.	Oxidation & reduction Reactions : Oxidation-Definitions, different oxidizing agents & Applications	1
2.	Reduction-Definitions, different reducing agents & Applications	1
UNIT -VI		
1.	Preparation, test for purity, assay and medicinal uses of some official Compounds: Chlorbutol, Dimercaprol, Glyceryl trinitrate, Urea	1
2.	Ethylene diamine dihydrate, vanillin, paraldehyde, ethylene chloride	1
3.	Lactic acid, tartaric acid, citric acid, salicylic acid, aspirin	1




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4.	Methyl salicylate, ethyl benzoate, benzyl benzoate, dimethyl pthalate, sodium lauryl sulphate	1
5.	Saccharin sodium & mephensin	1



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 Ramnagar Dist. Hanumakonda- 506001, (T.S)

Subject: Pharmaceutical Organic Chemistry -I

Program Name: B.Pharm

Year/Sem: II SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT -I		
1.	Classification, nomenclature and isomerism : Classification of Organic Compounds	1
2.	Common system of nomenclature of organic compounds	1
3.	IUPAC system of nomenclature of organic compounds	1
4.	Structural isomerisms in organic compounds	1
UNIT -II		
1.	Alkanes, Alkenes and Conjugated dienes: Introduction to Alkanes, preparations & reactions	2
2.	Introduction to Alkenes, preparations & reactions	2
3.	Introduction to conjugated dienes, preparations & reactions	2
4.	Hybridization concept introduction	2
UNIT -III		
1.	Alkyl halides: Introduction to Alkanes, preparations & reactions	2
2.	SN1 and SN2 reactions	2
3.	E1 and E2 reactions	2
4.	Structure and uses of selected alkyl halides	1
5.	Alcohols : Introduction to Alcohols, preparations & reactions	2
6.	Qualitative & Distinguishing tests	1
7.	Structure and uses of selected alcohols	1



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UNIT -IV		
1.	Carbonyl compounds (Aldehydes and ketones): Introduction to Aldehydes, preparations & reactions	2
2.	Qualitative & Distinguishing tests	2
3.	Introduction to ketones, preparations & reactions	6
4.	Qualitative & Distinguishing tests	1
5.	Named reactions: mechanism and applications	2
UNIT -V		
1.	Carboxylic acids : Introduction to carboxylic acids, preparations & reactions	2
2.	Qualitative tests	1
3.	Structure and uses of selected carboxylic acids	1
4.	Introduction to amides and esters	1
5.	Introduction to aliphatic amines, preparations & reactions	2
6.	Qualitative & Distinguishing tests	1
7.	Structure and uses of selected aliphatic amines	1



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Subject: Bio Chemistry

Program Name: B.Pharm

Year/Sem: II SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT -I		
1.	Biomolecules: Introduction, classification, chemical nature and biological role of carbohydrate, lipids, nucleic acids, amino acids and proteins	4
2.	Bioenergetics: Concept of free energy, endergonic and exergonic reaction, Relationship between free energy, enthalpy and entropy; Redox potential	2
UNIT -II		
1.	Carbohydrate metabolism : Glycolysis – Pathway, energetics and significance	1
2.	Citric acid cycle- Pathway, energetics and significance	1
3.	HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency	1
4.	Glycogen metabolism Pathways and glycogen storage diseases (GSD) Gluconeogenesis- Pathway and its significance	2
5.	Hormonal regulation of blood glucose level and Diabetes mellitus	1



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6.	Biological oxidation : Electron transport chain (ETC) and its mechanism	1
7.	Oxidative phosphorylation & its mechanism and substrate level phosphorylation	2
8.	Inhibitors ETC and oxidative phosphorylation/Uncouplers	1
UNIT -III		
1.	Lipid metabolism : β -Oxidation of saturated fatty acid (Palmitic acid) Formation and utilization of ketone bodies; ketoacidosis	2
2.	De novo synthesis of fatty acids (Palmitic acid)	2
3.	Biological significance of cholesterol and conversion of cholesterol into bile acids, steroid hormone and vitamin D	2
4.	Disorders of lipid metabolism: Hypercholesterolemia, atherosclerosis, fatty liver and obesity	2
5.	Amino acid metabolism : General reactions of amino acid metabolism: Transamination, deamination & decarboxylation, urea cycle and its disorders	2
6.	Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenylketonuria, Albinism, alpeptonuria, tyrosinemia)	2
7.	Synthesis and significance of biological substances; 5-HT, melatonin, dopamine, noradrenaline, adrenaline	1
8.	Catabolism of heme; hyperbilirubinemia and jaundice	1
UNIT -IV		
1.	Nucleic acid metabolism and genetic information transfer : Biosynthesis of purine and pyrimidine nucleotides	2
2.	Catabolism of purine nucleotides and Hyperuricemia and Gout disease	2
3.	Organization of mammalian genome	1
4.	Structure of DNA and RNA and their functions	1
5.	DNA replication (semi conservative model)	1
6.	Transcription or RNA synthesis	1




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7.	Genetic code, Translation or Protein synthesis and inhibitors	2
UNIT -V		
1.	Enzymes : Introduction, properties, nomenclature and IUB classification of enzymes	1
2.	Enzyme kinetics (Michaelis plot, Line Weaver Burke plot)	2
3.	Enzyme inhibitors with examples	1
4.	Regulation of enzymes: enzyme induction and repression, allosteric enzymes regulation	1
5.	Therapeutic and diagnostic applications of enzymes and isoenzymes; Coenzymes – Structure and biochemical functions	2



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Subject: Pharmaceutical Organic Chemistry -II

Program Name: B.Pharm

Year/Sem: III SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT - I		
1.	Benzene and its derivatives: A. Analytical, synthetic and other evidences in the derivation of structure of benzene, Orbital picture, resonance in benzene, aromatic characters, Huckel's rule	3
2.	B. Reactions of benzene - nitration, sulphonation, halogenation- reactivity, Friedelcrafts alkylation-reactivity, limitations, Friedelcrafts acylation.	4
3.	C. Substituents- effect of substituents on reactivity and orientation of mono substituted benzene compounds towards electrophilic substitution reaction	2
4.	D. Structure and uses of DDT, Saccharin, BHC and Chloramine	1
UNIT - II		
1.	Phenols: Acidity of phenols, effect of substituents on acidity, qualitative tests	2
2.	Methods of preparation and reactions of Phenol	2
3.	Structure and uses of phenol, cresols, resorcinol, naphthols	1
4.	Aromatic amines: Basicity of amines, effect of substituents on basicity,	1
5.	Methods of preparation and reactions of Aromatic amines	2
6.	Synthetic uses of aryl diazonium salts	2



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7.	Aromatic Acids : Acidity, effect of substituents on acidity and important reactions of benzoic acid.	2
UNIT -III		
1.	Fats and Oils : a.Fatty acids – reactions	1
2.	b. Hydrolysis, Hydrogenation, Saponification and Rancidity of oils, Drying oils	3
3.	c. Analytical constants – Acid value, Saponification value, Ester value, Iodine value, Acetyl value, Reichert Meissl (RM) value – significance and principle involved in their determination	6
UNIT -IV		
1.	Polynuclear hydrocarbons: Synthesis, Reactions & Structure of Naphthalene, Phenanthrene, and medicinal uses of their	4
2.	Synthesis, Reactions & Structure of Anthracene, Diphenylmethane and medicinal uses of their derivatives	3
3.	Synthesis, Reactions & Structure of Triphenylmethane and medicinal uses of their derivatives	3
UNIT -V		
1.	Cycloalkanes : Stabilities – Baeyer’s strain theory, limitation of Baeyer’s strain theory	2
2.	Coulson and Moffitt’s modification, Sachse Mohr’s theory (Theory of strainless rings)	2
3.	Methods of preparations & Reactions of cyclopropane and cyclobutane only	2



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Subject: Pharmaceutical Organic Chemistry -III

Program Name: B.Pharm

Year/Sem: IV SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT - I		
1.	Stereoisomerism : Optical isomerism, enantiomerism, diastereomerism and Meso compounds	4
2.	Chirality, Elements of symmetry	2
3.	D&L configurations	1
4.	Sequence rules and R&S configurations	2
5.	Racemic modifications and its resolutions	2
6.	Asymmetric synthesis- partial and absolute	2
UNIT - II		
1.	Geometrical isomerism : Cis-Trans, E&Z and Syn-anti configurations	2
2.	Methods of determination of configuration of geometrical isomers	1
3.	Conformational isomerism in Ethane, n-Butane and Cyclohexane	3
4.	Stereo isomerism in biphenyl compounds (Atropisomerism) and conditions for optical activity	2
5.	Stereospecific and stereoselective reactions	2
UNIT - III		
1.	Heterocyclic compounds : Nomenclature and classification	2



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2.	Synthesis, reactions and medicinal uses of Pyrrole, Furan, and Thiophene	2
3.	Relative aromaticity, reactivity and Basicity of pyrrole	1
UNIT -IV		
1.	Synthesis, reactions and medicinal uses of Pyrazole, Imidazole, Oxazole and Thiazole	4
2.	Synthesis, reactions and medicinal uses of Pyridine, Quinoline, Isoquinoline, Acridine and Indole	4
3.	Basicity of pyridine	1
4.	Synthesis and medicinal uses of Pyrimidine, Purine, azepines and their derivatives	3
UNIT -V		
1.	Reactions of synthetic importance : Metal hydride reduction (NaBH_4 and LiAlH_4)	2
2.	Clemmensen reduction, Birch reduction, Wolff Kishner reduction	3
3.	Oppenauer-oxidation and Darkin reaction	2
4.	Beckmanns rearrangement and Schmidt rearrangement	2
5.	Claisen- Schmidt condensation	1



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Subject: Medicinal Chemistry-I


Program Name: B.Pharm

Year/Sem: IV SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT - I		
1.	Introduction to medicinal chemistry: History and Development of medicinal chemistry	2
2.	Physico chemical properties	4
3.	Drug Metabolism	4
UNIT - II		
1.	Drugs acting on Autonomic Nervous system- Sympathetic Agents: Adrenergic neurotransmitters	2
2.	Sympathomimetic agents	4
3.	Sympatholytic agents	4
UNIT - III		
1.	Drugs acting on Autonomic Nervous system- Parasympathetic Agents: Cholinergic Neurotransmitters	2
2.	Parasympathomimetic agents	4
3.	Parasympatholytic agents	4
UNIT - IV		




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1.	Drugs acting on central nervous system 1: Sedatives and hypnotics	3
2.	Antipsychotics	3
3.	Anticonvulsants	2
UNIT -V		
1.	Drugs acting on central nervous system 2 : General anesthetics	2
2.	Narcotic and non narcotic analgesics	2
3.	Anti inflammatory agents	3




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Subject: Medicinal Chemistry-II

Program Name: B.Pharm

Year/Sem: V SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT -I		
1.	Antihistaminic agents: Histamine receptors and distribution	1
2.	H1 Antagonists	2
3.	H2 Antagonists	1
4.	Gastric proton pump inhibitors	1
5.	Antineoplastic agents: Alkylating agents	2
6.	Antimetabolites	1
7.	Antibiotics	1
8.	Plant products and miscellaneous	1
UNIT -II		
1.	Antianginals: Vasodilators	2
2.	Calcium channel blockers	2
3.	Diuretics	3
4.	Antihypertensive agents: Classification, antihypertensive drugs	3
UNIT -III		
1.	Antiarrhythmic drugs:	4
2.	Antihyperlipidemic agents	2
3.	Coagulants and anticoagulants	2
4.	Drugs used in CHF	1
UNIT -IV		



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1.	Drugs acting on endocrine system: Sex hormones	1
2.	Drugs for erectile dysfunction	1
3.	Oral contraceptives	2
4.	corticosteroids	2
5.	Thyroid and antithyroid drugs	2
UNIT -V		
1.	Antidiabetic agents: Insulin and its preparations	2
2.	Local anesthetics: SAR	1
3.	Benzoic acid derivatives	1
4.	Amino benzoic acid derivatives	1
5.	Lidocaine/anilide derivatives	1
6.	Miscellaneous	1




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Subject: Medicinal Chemistry-III

Program Name: B.Pharm

Year/Sem: VI SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT - I		
1.	Antibiotics: Introduction	2
2.	Beta lactam antibiotics	3
3.	Aminoglycosides	3
4.	Tetracyclins	2
UNIT - II		
1.	Macrolide antibiotics	2
2.	Prodrugs: Concepts, Application	2
3.	Antimalarials : Etiology of malaria	1
4.	Quinolones	2
5.	Biguanides and dihydrotriazines	2
6.	Miscellaneous	1
UNIT - III		
1.	Antitubercular agents : Synthetic antitubercular agents	2
2.	Antitubercular antibiotics	2
3.	Urinary tract antiinfective agents: Quinolones	2
4.	Miscellaneous	2
5.	Antiviral agents	2
UNIT - IV		
1.	Antifungal agents : Antifungal antibiotics	2
2.	Synthetic antifungal agents	2
3.	Anti protozoal agents	2
4.	Anthelmintics	1
5.	Sulphonamides and Sulfones	1
UNIT - V		
1.	Introduction to Drug design, Various approaches	2
2.	Physiochemical parameters	2
3.	Pharmacophore modeling and docking techniques	1
4.	Combinatorial chemistry: Concepts and Applications	2



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Subject: Biopharmaceutics and Pharmacokinetics
Year/Sem: VI SEM

Program Name: B.Pharm
Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT -I		
1.	Introduction to Biopharmaceutics: Mechanisms of drug absorption through GIT	1
2.	Factors influencing drug absorption through GIT	3
3.	Absorption of drug from Non per oral extravascular routes	1
4.	Distribution of drugs Tissue permeability of drugs and binding of drugs	2
5.	Protein binding of drugs, factors affecting protein drug binding and Kinetics of protein binding	2
6.	Clinical significance of protein binding of drugs, Apparent volume of drug distribution	1
UNIT -II		
1.	Biotransformation : Phase I Bioransformaion	2
2.	Phase II Bioransformaion	2
3.	Renal excretion of drugs, factors affecting renal excretion of drugs	1
4.	Renal clearance and Non renal routes of drug excretion of drugs	1
5.	Objectives of bioavailability studies, absolute and relative bioavailability, measurement of bioavailability	1
6.	In-vitro drug dissolution models, in- vitro, in-vivo Correlations	1
7.	bioequivalence studies, methods to enhance the bioavailability	2
UNIT -III		
1.	Pharmacokinetics : Introduction to Pharmacokinetics models ,Compartment model	2
2.	Non compartment models, physiological models	1
3.	One compartment open model Intravenous Injection (Bolus)	2
4.	One compartment open model Intravenous infusion	1
5.	One compartment open model extra vascular Administrations	2
6.	calculations KE from plasma and urinary excretion data	2
UNIT -IV		



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1.	Multicompartment models : Two compartment open model. IV bolus	2
2.	Multiple - Dosage Regimens	2
3.	Repetitive Intravenous injections - One Compartment Open Model	2
4.	Repetitive Extravascular dosing - One Compartment Open model	2
5.		
UNIT -V		
1.	Nonlinear Pharmacokinetics: Introduction	1
2.	Factors causing Non-linearity	3
3.	Michaelis-menton method of estimating parameters	3




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Subject: Industrial Pharmacy

Program Name: B.Pharm

Year/Sem: VII SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
UNIT -I		
1.	Pilot plant scale up techniques: General considerations	3
2.	Documentation	2
3.	SUPAC guidelines	3
4.	Introduction to Platform technology	2
UNIT -II		
1.	Technology development and transfer: WHO guidelines for Technology Transfer	1
2.	Granularity of TT Process	2
3.	Premises and equipments	2
4.	Quality control	1
5.	Approved regulatory bodies and agencies	2
6.	TOT agencies in India	2
UNIT -III		
1.	Regulatory affairs : Introduction	3
2.	Regulatory authorities	3
3.	Regulatory requirements for drug approval	4
UNIT -IV		
1.	Indian Regulatory Requirements : Central Drug Standard Control Organization (CDSCO)	2
2.	State Licensing Authority	3
3.	Certificate of Pharmaceutical Product (COPP)	3
UNIT -V		
1.	Industrial Safety : Plant Location & layout	2
2.	Hazards	3
3.	Accident records	2



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Subject: Novel Drug Delivery System

Program Name: B.Pharm

Year/Sem: VII SEM

Theory/Lab: Theory

LESSON PLAN		
S.No	Topics to be covered	Hours Required
	UNIT -I	
1.	Controlled drug delivery systems	6
2.	Polymers	4
	UNIT -II	
1.	Microencapsulation	3
2.	Mucosal Drug Delivery system	4
3.	Implantable Drug Delivery Systems	3
	UNIT -III	
1.	Transdermal Drug Delivery Systems	3
2.	Gastroretentive drug delivery systems	4
3.	Nasopulmonary drug delivery system	3
	UNIT -IV	
1.	Nanotechnology and its Concepts	8
	UNIT -V	
1.	Ocular Drug Delivery Systems	7



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