ANURAG GROUP OF INSTITUTIONS
(AUTONOMOUS)
(Formerly CVSR College of Engineering)
Venkatapur, Ghatkesar, Hyderabad – 500 088.
www.cvsr.ac.in

COURSE STRUCTURE AND
DETAILED SYLLABUS

IV- B.PHARM - I & II - SEMESTERS

B - PHARMACY

FOR
B.TECH FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2012-2013)

M.Tech. Programs:
M.Tech (Computer Science and Engineering)
M.Tech (Software Engineering)
M.Tech (Computer Science)
M.Tech (Computer Networks & Information Security)
M.Tech (Power Electronics & Electrical Drives)
M.Tech (Electrical Power Systems)
M.Tech (CAD/CAM)
M.Tech (Machine Design)
M.Tech (VLSI System Design)
M.Tech (Embedded Systems)
M.Tech (Electronics & Communications Engineering)
M.Tech (Wireless & Mobile Communication)
M.Tech (Structural Engineering)
M.Tech (Construction Management)

Master of Business Administration
Master of Computer Application
COURSE STRUCTURE
AND
DETAILED SYLLABUS

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www.cvsrc.ac.in
### COURSE STRUCTURE AND SYLLABUS

#### IV YEAR I SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Name</th>
<th>Lectures</th>
<th>T/P/D</th>
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<td>Biopharmaceutics and Pharmacokinetics</td>
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#### COURSE STRUCTURE

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## Course Structure and Syllabus

### IV Year II Semester

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<td>A68005</td>
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** Suggested areas for project work

1. Industrial Pharmacy
2. Clinical Pharmacy/Pharmacology
3. Pharmacognosy/Medicinal Chemistry
4. Pharmaceutical Analysis/Quality Assurance
5. Pharmaceutical Marketing

The candidates have to undergo Industrial training for one month (200 hours minimum) during 3rd year summer vacation.

Note: All the end examinations (Theory and Practical) are of Three hours duration.

T – Tutorial               P – Practical
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B.Pharmacy IV year I Sem  
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3 1 3  

(A67001) PHARMACEUTICAL ANALYSIS-II

UNIT I  
UV-Visible Spectrophotometry: Introduction to spectroscopy, Beer-Lambert’s Law & Deviations, Principle, Theory, WoodWard-Fieser Rule, Instrumentation, Applications  
Flourimetry: Principle, Theory, Instrumentation, Applications

UNIT II  
Infrared Spectrophotometry: Principle, Theory, Instrumentation, Applications, Basic principles in Interpretation of IR Spectra  
Atomic Absorption Spectroscopy: Principle, Theory, Instrumentation, Applications

UNIT III  
Nuclear Magnetic Resonance Spectrophotometry: Principle, Theory, Instrumentation, Applications, Basic principles in Interpretation of NMR Spectra  
Mass Spectrometry: Principle, Theory, Instrumentation, Applications, Basic principles in Interpretation of Mass Spectra

UNIT IV  
Basic Principles and Applications of  
X-Ray Diffraction Spectroscopy  
Differential Scanning Calorimetry & Differential Thermal Analysis  
Radio Immuno Assay & Enzyme Linked Immunosorbent Assay

UNIT V  
Gas Chromatography: Principle, Theory, Instrumentation, Applications  
HPLC: Principle, Theory, Instrumentation, Applications  
HPTLC: Principle, Theory, Instrumentation, Applications

TEXT BOOKS  
2. Dr Gurudeep R. Chatwal, Dr Sham K.Anand (2002) Instrumental Methods
3. Doulas A.Skoog, F.James Holler, Stanley R.Crouch (2011) Instrumental
Analysis, Indian Edition., Cengage Learning
4. Dr B.K. Sharma (2011) Instrumental Methods of Chemical Analysis, 27th

REFERENCES
& Company PVT Limited.
(1986) Instrumental Methods of Analysis, 7th edtn., New Delhi: CBS
Publishers & Distributors.
4. Indian Pharmacopoeia 2011
ANURAG GROUP OF INSTITUTIONS
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B.Pharmacy IV year I Sem

L T/P/D C
3 1 3

(A67002) BIOPHARMACEUTICS AND PHARMACOKINETICS

UNIT-1

UNIT-2
Drug Metabolism: Pathways of drug metabolism, Phase-I (oxidative, reductive and hydrolytic reaction) Phase-II reactions (conjugation), factors affecting metabolism, Physico-chemical factors, Chemical factors and Biological factors. Drug Excretion: Glomerular filtration, tubular secretion and reabsorption, Effects of pH and other drugs Clearance concept, Factors affecting renal clearance, Excretion through bile, feces, lungs and skin in brief.

UNIT-3
Bioavailability and Bioequivalence: Definition, concept of equivalents, definition of various types of equivalents, types of bioavailability studies, measurement of bioavailability, plasma level and urinary excretion studies, Bioequivalent Study design, Latin square design, Cross over design, Randomized block design, bioavailability protocol.

UNIT-4
Pharmacokinetics: Basic considerations, compartment modeling, one compartmental open model - i.v bolus, extravascular administration, Method of residual, Wagner – Nelson method, Urinary excretion studies, Calculation of Pharmacokinetic parameters. Brief overview of nonlinear kinetics, non compartmental model.
UNIT-5
Biostatistics: A brief introduction to probability, Histogram, standard error, standard deviation, Linear regression and correlation, coefficient of correlation, t-test, Analysis of variance (ANOVA), non parametric tests (Z test, sign test)

TEXT BOOKS
1. DM Brahmkar and SB Jaiswal, Biopharmaceutics and Pharmacokinetics, a treatise, Vallabh Prakasham, Delhi
2. Venkateshwarlu, Fundamentals of Biopharmaceuticals and Pharmacokinetics, Pharma Book Syndicate
3. P.L. Madan, Biopharmaceutics and Pharmacokinetics, Jaypee Bros

REFERENCES
1. Morden Pharmaceutics by Banker Marcel Dekker Inc, NY
2. Remington’s pharmaceutical sciences Mac Pub Co, Easton Pennsylvania
3. Robert E notary, Biopharmaceutics and Pharmacokinetics
ANURAG GROUP OF INSTITUTIONS
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B.Pharmacy IV year I Sem

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3 1 3

(A67003) PHARMACOLOGY - III

UNIT - I
Drugs Acting on the Gastrointestinal Tract
a. Antacids, Antisecretory and Anti-ulcer Drugs
b. Laxatives and antidiarrhoeal drugs
c. Appetite Stimulants and Suppressants.
d. Emetics and anti-emetics
e. Miscellaneous; Carminatives, demulcents, protectives, adsorbents, astringents, digestants, enzymes and mucolytics.

UNIT- II
Chemotherapeutic agents and their applications:
a. General principles of chemotherapy.
b. Sulphonamides and co-trimoxazole.
c. Antibiotics: Penicillins, cephalosporins, betalactams,

UNIT-III
Chemotherapeutic agents and their applications:
Tetracyclines, aminoglycosides, chloramphenicol, erythromycin, quinolones and miscellaneous antibiotics.
Chemotherapy of tuberculosis & leprosy.

UNIT-IV
a) Chemotherapy of fungal diseases, viral diseases, urinary tract infections and sexually transmitted diseases.
b) Drug used for contraception
c) Chemotherapy of malignancy and immunosuppressive Agents.

UNIT-V
Principles of Toxicology:
a) Definition of poison, general principles of treatment of poisoning with particular reference to barbiturates opioids, organophosphorus and atropine poisoning.
b) Heavy metals and heavy metals antagonists
c) Diagnostic agents
TEXTBOOKS
1. Sathoskar, Pharmacology and pharma co the rapeutics, Vol.1&2, Publ by Popular Prakashan, Mumbai.
2. Bertram. G.Katzung, Basic and clinical pharmacology
3. Tripathi, Textbook of Pharmacology.

REFERENCEBOOKS
3. J.Crossland, Lewis‘s Pharmacology, Church living stone.
5. Screening Methods in Pharmacology I vol.Set TURNER, Elsevier
ANURAG GROUP OF INSTITUTIONS
(Autonomous)

B.Pharmacy IV year I Sem

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3   1   3

(A67004) MEDICINAL CHEMISTRY – II

UNIT – I
Drug discovery and drug design: Introduction to discovery of lead molecule, lead optimization, pharmacophore identification, general structural activity relationships.
Computer aided drug design: Introduction to CADD, parameters in QSAR, applications of Hansch analysis, Free Wilson analysis.

UNIT – II
Antibiotics: Brief historical background, definition, classification of antibiotics.
Penicillins: Historical background and biological sources, structures of different penicillins.
Reactions: Hydrolysis of penicillin by cold and hot dilute mineral acid, alkali, enzymatic hydrolysis with penicillinase, amidase.
Classification of penicillins, general methods of synthesis of penicillins from 6-APA, SAR, mechanism of action, therapeutic uses and toxicity. A note on lactamase inhibitors.

UNIT – III
Cephalosporins: Biological sources, structures of some important Cephalosporins and Cephemycins. Acid hydrolysis of Cephalosporin C. Comparision of 6-APA and 7-ACA, penam and cephem
Classification: Generations of Cephalosporins, Oral and parenteral, SAR and advantages over penicillins.

UNIT – IV
Tetracyclins: Biological sources, structures of the important tetracyclins, important structural units and the three acidity constants in the tetracycline molecule, amphoteric nature, mechanism of action, spectrum of activity, SAR and toxicity.
Aminoglycosides: Structure of streptomycin, acid hydrolysis, mechanism of action, therapeutic uses and toxicity. Dihydrostreptomycin and its importance. A mention of other aminoside glycoside antibiotics.
UNIT – V
Immunosuppressive agents: Brief introduction to therapeutic agents developed from recombinant DNA technology.
Diagnostic agents and radioprotective agents.
Brief introduction to combinatorial synthesis in solid phase and liquid phase.

TEXT BOOKS

REFERENCES
(A67005) PHARMACY ADMINISTRATION

Unit-I
Features of Business Organizations and New Economic Environment:
Manufacturing Management: Goals of Production Management and Organisation-Production, Planning and control-Plant location-Principles and Types of plant layout –Methods of production (Job, batch and Mass Production), New Product Development.
Work Study-Basic procedure involved in method study and work measurement-statistical quality control: X chart, R chart, c chart, p chart, (simple problems), Acceptance sampling, Deming’s contribution to quality.

Unit-II
Behavioral Pharmacy: Compliants/Adherence to medications.
Introduction to Pharmacoeconomics: Definitions of Efficacy: Comparative cost effectiveness ratios; Comparative Clinical Effectiveness and cost Benefit ratios.
Pharmaceutical Outcomes (Quality of life concepts)
History of Pharmaceutical outcomes movements in India and abroad
Pharmacovigilence/PharmacoEpidemiology:
Present status in India: State and central initiatives; Reporting of Adverse Drug Reactions; Prescribes format for reporting Adverse Drug Reactions; Irrational Drug Combinations; List of Drugs banned by Governemnt of India and other state Governments.

Unit-III
Organization of Distribution and Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life cycle, Channels of distribution-Factors influencing channels of distribution, sales organization and sales promotion.
UNIT IV
Pharma Industry: Growth of Pharma Industry in India-current status and its role in building national economy and national health-Structure of Pharma industry in India-PSUs in Pharma industry-Progress in the manufacture of basic drugs, synthetic and drugs of vegetable origin, Export and import of drugs and pharmaceuticals-Export and import trade.

Unit V
Insurance and Pharma: Various types of insurance including marine and health insurance
Pharmaceutical Associations and Societies, statutory councils governing the profession. General Principles of medical detailing.
Principles of drug store and community pharmacy administration: Drug store planning and layout, sales promotion and salesmanship in drug store. Accounting records in drug stores.

TEXT BOOKS
1. Aryasri and Subbarao, Pharmaceutical Administration, TMH.
2. Smarta, Strategic Pharma Marketing.
3. G Vidya Sagar, Pharmaceutical Industrial Management.

REFERENCES
1. Subbarao Chaganti, Pharmaceutical Marketing in India-Concepts and Strategy cases, Pharma Book Syndicate
2. O.P Khanna, Industrial Management, Dhanpatrai, New Delhi
B. Pharmacy IV year I Sem

L  T/P/D  C
0  3  2

(A67201) PHARMACEUTICAL ANALYSIS-II LAB

EXPERIMENTS
1. Interpretation of IR Spectra of any two drugs
2. Determination of $\lambda_{\text{max}}$ of a drug
3. Assay of any two drugs by UV-spectro photometry.
4. Assay of any two drugs by Colorimetric method.
5. Assay of Quinine Sulphate by Flourimetry
6. Ascending paper chromatography.
7. Radial paper chromatography.
8. Two dimension chromatography
10. Column chromatography
12. HPLC (Demonstration Only).

REFERENCES
1. B.G. Naagavi, Laboratory Handbook of Instrumental Drug Analysis, vallabh Prakashan Publications
2. Indian Pharmacopoeia, 2011
B.Pharmacy IV year I Sem

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0 3 2

(A67202) BIOPHARMACEUTICS AND PHARMACOKINETICS LAB

1. Experiments designed for the estimation of various pharmacokinetic parameters with given data
2. In–vitro evaluation of different dosage form for drug release
3. Analysis of biological specification for drug content and estimation of pharmacokinetic parameter
4. Absorption studies- in vitro and invivo
5. Statistical treatment of pharmaceutical data
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B. Pharmacy IV year I Sem

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(A67203) PHARMACOLOGY – III LAB

1. Experiments on isolated preparations.
   a. To calculate the PA2 value of atropine using acetylcholine as an agonist on rat ileum preparation.
   b. To calculate the PA2 value of mepyramine or chlorampheniramine using histamine as an agonist on guinea pig ileum.
   c. To find out the strength of the given sample on (e.g. Acetylcholine, Histamine, 5-HT, Oxytocin etc.) using a suitable isolated muscle preparation by

2. Matching Assay:
   Two point Assay
   Three point Assay

3. Pharmacology of the Gastrointestinal Tract
   To study the anti secretory and anti ulcer activity using pylorus ligated rats.
Estimations of the following active pharmaceutical ingredients:
1. Ascorbic acid.
2. Phosphoric acid by volumetric method.
3. Alkaloid by gravimetry.
4. Lactic acid by volumetric method.
5. Salicylic acid by volumetric method.
6. Aspirin by volumetric method.

Assay of some drugs from their formulations:
1. Glibenclamide (hypoglycaemic agent)
2. Metronidazole (antiprotozoal)
3. Ibuprofen (analgesic, anti-inflammatory)
4. Furosemide (Diurtic)
5. Phenyoin (anticonvulsant)
6. Phenobarbitol (Sedative and hypnotic)
7. Diethylcarbamazine (antihelminthic)
8. Compound benzoic acid (antifungal)

REFERENCES
3. P.D. Sethi – Quantitative Analysis of Drugs and Pharmaceuticals.
UNIT-1
Oral Control Drug Delivery System:
Fundamental study of different types of oral controlled drug delivery system, Dissolution controlled, diffusion controlled, ion exchange resin, Osmotic pressure based system, pH independent system, altered density systems, detailed study of Matrix system.

UNIT-2
Novel Drug Delivery System:
Transdermal Drug Delivery System: Fundamentals, Different approaches of TDDS, Materials employed, Evaluation and Application of TDDS
Mucoadhesive Delivery System: Mechanism of Bioadhesion, mucoadhesive materials, Formulation and evaluation of mucoadhesive drug delivery system.

UNIT-3
Targeted Drug Delivery System:
Fundamentals of Targeting, a brief introduction about Drug carriers, Formulation, evaluation and application of Liposomes, Nanoparticles.

UNIT-4
Introduction to Drug Regulatory Agencies:
Indian CDSCO, Introduction to Global regulatory authorities (US FDA, Canadian HPFBI, Australian TGA) Introduction to IND, NDA, ANDA submissions of USFDA
Introduction to quality assurance activities related to warehouse control, manufacturing control, packaging control.
Introduction to Good Manufacturing Practices: Salient features of Schedule –M (India)

UNIT-5
Introduction to Validations:
Process validation (prospective, retrospective & concurrent), analytical method validation (accuracy, precision, and specificity), and cleaning
validation (sampling procedure and acceptance criteria)

TEXT BOOKS
2. N.K.Jain ,Control and Novel Drug Delivery

REFERENCES
1. S.P.Vyas &R.K.Khar ,Targeted & Controlled Drug Delivery
4. Lippincott Williams and Wilkins ,Remington Pharmaceutical Sciences
5. Gilbert S. Banker and Chirstopher T Rhodes ,Morden Pharmaceutics,Vth edition,marcel dekker, USA,2005
6. Good Manufacturing Practices –Schedule M read with The Drugs and Cosmetic Rules 1945
ANURAG GROUP OF INSTITUTIONS
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B.Pharmacy IV year II Sem

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3   1     3

(A68002) PHARMACEUTICAL BIOTECHNOLOGY

UNIT - I
Fermentation Technology: Isolation, Selection, Screening of Industrial important microbes, Strain improvement. Types, design & operation of Bioreactor. Types of fermentations, optimization of fermentation process, Principle and Procedure involving in downstream process and effluent treatment.
Specific Fermentations: Selection of organism, fermentation & purification of various antibiotics like penicillin, streptomycin, vitamins like riboflavin, organic acids like lactic acid, alcohol etc.
Microbial Transformations: Types, Methods of bioconversions & Application in Pharma Industry.

UNIT – II
Recombinant DNA Technology: Introduction to r-dna technology and genetic engineering, steps involved, isolation of enzymes, vectors, recombination and cloning of genes.
PCR and its applications in biotechnology. Production of biotechnology derived therapeutic proteins like humulin, activase, monoclonal antibodies by hybridoma technique, recomivax HB (hepatitis b).
Plant and animal tissue culture techniques and its applications.

UNIT – III

UNIT – IV
Enzyme Technology: Techniques of immobilization of enzymes, factors affecting enzyme kinetics. Study of enzymes such as penicillinase, streptokinase, amylase, protease etc. immobilization of bacteria & plant cells.

UNIT - V
Introduction, role, collection, process & storage of blood products, plasma
substitutes and sutures & ligatures like whole human blood, human normal ig, dextran etc. Introductory study & applications of bioinformatics, proteomics and genomics.

TEXT BOOKS
1. Pharmaceutical biotechnology by Dr.K.Tarakaram and Prof.K.N.Jayaveera, S.Chand & Co.,
2. Wulf Crueger and Anneliese Crueger, Biotechnology, 2nd Ed, Publ- Panima publication co-operation, New Delhi.

REFERENCES
1. Prescott and Dunne, —Industrial Microbiology || MC Graw Hill Book Company
2. K. Kielsliched —Biotechnology || Vol 6, Verlegchemic, Switzerland.
3. PF Standury & A. Whitaker, —Principles of fermentation Technology || Pergamon Press, Oxford
4. A. Wiseman, Handbook of enzyme biotechnology. 3rd Edition Elis Horwood
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B.Pharmacy IV year II Sem

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3  1  3

(A68003) MEDICINAL CHEMISTRY-III

Note:
A study of the following classes of drugs including introduction, classification with examples of structures, mechanism of action, SAR and metabolism, synthesis of compounds specified against each class is to be studied for the following units.

UNIT – I
Drugs acting on Cardio-vascular diseases:
General account of cardiovascular diseases
Antihypertensives-Methyldopa, Amlodipine, Enalapril, Losartan
Antiarrhythmics-Procainamide
Anticoagulants, Anti-anginals and coronary vasodilators-Warfarin, Isosorbide dinitrate, Verapamil, Diltiazem
Diuretics-Acetazolamide, Hydrochlorothiazide, Furosemide

UNIT-II
Antihyperlipidemics (hypoglycaemic drugs) - Clofibrate. A brief account on statins
General account on pancreatic and thyroid hormonal malfunctions.
Antidiabetics- Phenformin, Glipizide including a brief account on PPAR inhibitors, Meglitinide analogues.
α-Glucoside inhibitors-Acarbose, Migitol
Drugs affecting Thyroid Function- Methimazole, Propylthiouracil, Insulin preparations

UNIT-III
Analgesics and NSAIDS (Non-steroidal anti-inflammatory agents):
Introduction and types of pain and inflammation
Classification and systematic development of analgesics of morphine, mild analgesics and strong analgesics: Meperidine and Methadone
NSAIDS- Aspirin, Paracetamol, Ibuprofen, Indomethacin, Diclofenac, Meloxicam
A brief account on Cox-2 inhibitors
UNIT-IV
Chemotherapeutic Agents:
Anticancer drugs: 5-Flourouracil, 5-Mercaptopurin, Methotrexate, Vincristine, Vinblastine
Sulpha drugs- Sulphadiazine, Sulphasalazine, Trimethoprim, Sulphamethoxazole
Antiviral drugs- Acyclovir, Zidovudine
Antifungal agents- Fluconazole, Itraconazole

UNIT-V
Antitubercular agents: Isonicotinic acid hydrazide and Ethambutol
Antileprotic agents: Dapsone, Clofazimine
Antiamoebics: Metronidazole, Diloxanid furoate
Anthelmintics: Diethyl carbamazine citrate, Pyrantel pamoate, Mebendazole
Antimalarial drugs: Chloroquine, Pyrimethamine, Norfloxacin, Ciprofloxacin

TEXT BOOKS
4. Sri Ram, Medicinal Chemistry.
5. Rama Rao Nadendla, Medicinal Chemistry.

REFERENCES
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B.Pharmacy IV year II Sem       L  T/P/D  C
                                  3  1     3

(A68004) PHARMACOGNOSY-III

UNIT I
ANALYTICAL PHARMACOGNOSY
1) Drug adulteration
2) Drug evaluation- Organoleptic, Microscopic, Physical, Chemical and Biological methods of evaluation
a) Qualitative phytochemical screening
   1. Screening for primary metabolites: Carbohydrates, proteins and amino acids, Fats and fixed oils.
   2. Screening for secondary metabolites: Alkaloids, glycosides, steroid and terpenoids, flavonoids and phenolic compounds, tannins and saponins

UNIT II
a) Identification and isolation of the following constituents
   1) Sennosides from senna
   2) Quinine from cinchona
   3) Curcumin from turmeric
   4) Lycopene from tomato
b) Applications of chromatographic methods in evaluation of phyto constituents
   1) Paper chromatography- evaluations of carbohydrates and sugars
   2) TLC- evaluation of alkaloids and glycosides
   3) HPTLC- evaluation of steroids and terpenoids
   4) Column chromatography- evaluation of
   c) Herbal drug research in India
d) Industries based used herbal drugs in India.

UNIT III
1. PLANT TISSUE CULTURE:
   a) Brief introduction to plant tissue culture
   b) Types of cultures-callus culture, single cell culture, suspension culture, embryo culture
   c) Media requirements, Methodology for establishment of cultures, Growth measurements and applications
2. STUDY OF TRADITIONAL DRUGS:
Bilva, Brahmi, Guuggul, Menthi, Shatavari, Shankhpushpi.

UNIT IV
a) GENERAL INTRODUCTION TO ALTERNATIVE SYSTEMS OF MEDICINE:
   1. Ayurveda
   2. Homeopathy
   3. Unani
   4. Siddha
b) AYURVEDIC FORMULATIONS: Aristas, Asavas, Bhasmas, Choornas, Tailams and Lehyas

UNIT V
a) COSMECUTICALS- General introduction and study of role of following herbs in cosmetics
   Amla, Aloe vera, Soap nut, Turmeric, Sandalwood, Tea tree oil, Ginseng
b) NEUTRACEUTICALS-Definition and study of neutraceuticals:
   Garlic, Soya, Spirullina, Royal jelly

TEXT BOOKS:
7. Kokate, C.K, et al., Pharmacognosy, 2010, Pune, NiraliPrakashan, 45thed, 0.01–A104
REFERENCE BOOKS:
B.Pharmacy IV year II Sem L T/P/D C
3 1 3

(A68005) CLINICAL PHARMACY & THERAPEUTICS

UNIT–I
a) Introduction to Clinical Pharmacy
b) Clinical Pharmacokinetics and individualization of Drug Therapy.
c) Therapeutic drug monitoring
d) Concept of Essential Drugs. Drug and poisoning Information

UNIT–II
Basic concepts of Pharmacotherapy
a) Special precautions in drugs usage during infancy and in the elderly (Pediatrics & Geriatrics).
b) Special precautions in drugs usage during pregnancy & lactation
c) Adverse Drug Reactions
d) The Basics of Drug Interactions
e) Interpretation of Clinical laboratory Tests.

UNIT–III
Pathogenesis and therapy for following diseases
a) Cardiovascular Disorders: Hypertension, congestive heart failure, angina, acute myocardial infarction, cardiac arrhythmias
b) CNS Disorders: Epilepsy, Parkinsonism, schizophrenia, depression

UNIT–IV
a) Respiratory Disease: Asthma. COPD
b) Gastrointestinal Disorders: Peptic Ulcer Disease, Inflammatory bowel disease, Hepatitis and Cirrhosis.
c) Endocrine Disorders: Diabetes mellitus and Thyroid Disorders.

UNIT–V
a) Infectious Diseases: Tuberculosis, Urinary Tract Infection, Enteric Infections
b) Hematopoietic Disorders: Anaemias. Drug induced blood disorder.
c) Joint and Connective Tissue Disorders: Rheumatic disease, Gout, Hyperuricemia.
d) Neoplastic Diseases: Acute leuаemias, Hodgkin’s disease
TEXTBOOKS
2. Laurence, DR and Bennet PN. Clinical Pharmacology, Scientific book agency
3. Dr. D.R Krishna, V. Klotz, Clinical Pharmacokinetics, Publ Springer Verlab

REFERENCES
2. Hamsten, Drug interaction, KvenStockley.
4. Grahame smith and Aronson, Clinical pharmacology and drug therapy
5. Richard AHelms, TextBook of Therapeutics Drug and Disease Management Hardbound.
6. Hefindal Eand Hirschman JL, Williamsand Wilkins, Clinical Pharmacy and the rapeutics
7. Applied Therapeutics, The clinical uses of Drugs applied therapeutics INC
8. Dr. A.R. Paradker, Hospital and Clinical Pharmacy, NiraliPrakashan.
(A68201) NOVEL DRUG DELIVERY SYSTEMS &
REGULATORY AFFAIRS LAB

1. Preparation and Evaluation of matrix Tables.
2. Formulation and Evaluation of film Coated Tables.
3. Formulation and Evaluation of Enteric Coated Tables.
5. Formulation and Evaluation of Mucoadhesive Delivery Systems.
8. Demonstration of Liposome
9. Demonstration of FTIR
10. Analytical Method Validation(Linearity)
11. Assignment on Product development and filling to various regulatory agencies, FDA, MCC, EMEA, TGA.etc (Ref.: www.fda.gov)
B.Pharmacy IV year II Sem

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0 3 2

(A68202) PHARMACEUTICAL BIOTECHNOLOGY LAB

1. Isolation of antibiotic producing microorganism from soil.
2. Enzyme immobilization by ca-alginate method.
3. Determination of minimum inhibitory concentration of the given antibiotic. Antibiotic assay by cup plate method.
4. Collection, Processing, Storage and Fractionation of blood.
5. Standardization of cultures.
6. Microbiological assay of Antibiotic/Vitamins.
7. Production of alcohol by fermentation.
8. Comparison of efficacy of immobilized cells.
10. Isolation of mutans by gradient plate technique.
11. Preparation of bacterial vaccine and standardization.
12. Extraction of DNA.
ANURAG GROUP OF INSTITUTIONS
(Autonomous)

B.Pharmacy IV year II Sem

L T/P/D C
0 3 2

(A68203) PHARMACOGNOSY – III LAB

1. Measurement of phloem fibers of any two powdered crude drugs.
2. Determination of quality and pury of powdered crude drugs by iycopodium spore method (Ginger, Cardamomum, etc.)
3. Determination of leaf Constants
   a. Stomatal number and stomatal index of senna and Datura
   b. Vein islet number and veinlet termination number of Datura
4. Isolation of volatile oil from clove and eucalyptus.
5. Aspetic seed germination of Trigonella
6. Establishment of callus cultures of Catheranthus roseus.