

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## SYLLABUS FOR THRID YEAR B.PHARM

### 3.1 PHARMACEUTICAL MICROBIOLOGY

#### THEORY

2 hrs/ week

1. History and scope of Microbiology
2. Classification of microbes & their taxonomy, bacteria, viruses, fungi actinomyceres, Rickeri
3. \*\*\*\*\*, growth (including methods for synchronous growth ), cultivation, isolation and identification (morphological, staining & by prominent bio-chemical reactions) & preservation of bacteria.
4. Microbial spoilage and prevention of pharaceutical products : types of spoilage, factors effecting spoilage, sources and type of microbial contaminants, assessment of microbial contaminants, preservation of pharmaceutical product as per microbial limits special in pharmacopias.
5. Control of microbes:
  - (a) sterilization: significance and scope, classification, D-value, F-value, Z-value, methods of sterilization, pharmacopial, standard sterilization indicators-biological and chemicals.
  - (b) Disinfectants: control of microbes by physical and chemical methods. Classification and mode of action uses of various disinfectant evaluation of disinfectants and effectiveness of antimicrobial preservatives.
6. Blood products and plasma substitutes : collection, processing, labeling and storage of whole human blood , concentrated human RBC, dried human plasma, human fibrinogen, human thrombin, human normal immunoglobulin, human fibrin foam, plasma substitutes-ideal requirements, PVP, dextrin etc., control of blood pressure as per I.P. and B.P.
7. Steriliti testing of different types of pharmaceutical products as per pharmecopial procedure.
8. Primary and secondary defence mechanism of body, microbial resistance, interferes, antigence, pathogenic microbes of diseases like pneumonia, gonorrhea, diphtheria, cholera, plague, \*\*\*\*\*, \*\*\*\*\*, \*\*\*\*\*, leprosy, syphilis, rabish, poliomyctis, dengue, smallpox, measles, mums, aids and malaria, rickettsia, meningitits, typhoid.
9. Allergenic extracts: types of allergens, diagnosis of allergy, sensitivity testing, treatment of allergy, preparation testing and standardization of allergic extracts.

#### PRACTICALS

1. Study of microscope and other lab apparatus
2. Preparation and standardization of nutrients broth, agar slants, slabs, plates.
3. Techniques of inoculation on different types of media (cocco and bacilli)
4. Study of growth pattern of organism on selective medium.
  - (i) escherichia coli-mac conkey's agar
  - (ii) pseudomonase-cetrimide agar
  - (iii) staphylocous aureus-vogel johnson's medium inoculation an solid medium and observation of colony characters after incubation
5. Identification of isolated bacteria by
  - (i) gram staining
  - (ii) monochrome staining
  - (iii) negative staining
  - (iv) cell wall staining

- (v) spore staining
  - (vi) capsule staining
  - (vii) motility by hanging drop technique
- 6. Observation of permanent studies of malarial parasite pathogenic fungi: (candida albicans yeast), mycobacterium tuberculosis
- 7. Study of yeast and penicillin with respect to morphology (wet mount preparation)
- 8. Isolation of pure culture by pour plate and streak plate method.
- 9. Study of metabolic characteristic of micro organism ( amylase, xidase, catalase, urease, nitrates, coagulase, activity.)
- 10. Determination of thermal death temperature and time.
- 11. Counting of bacteria
- 12. Phenol coefficient of disinfectant by RW coefficient
- 13. Sterility testing of pharmaceutical product
  - (i) \*\*\*\*
  - (ii) Powders
- 14. Collection processing, storage, fractionation of blood
- 15. To study potency and sensitivity of some antibiotics

**BOOKS RECOMMENDED:**

1. Pharmaceutical microbiology-huge and russell, sixth edition, blackwall sci.
2. Pharmaceutical microbiology-huge and russell
3. Tutorial pharmacy- cooper and gunn
4. Basic and clinical immunology-h.h. fundenberg
5. Industrial microbiology- rescott and dunn
6. Textbook of microbiology-pelezar and reid
7. Microbiological methods-collons and iyne

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## SYLLABUS FOR THRID YEAR B.PHARM

### 302 PHARMACEUTICAL BIOTECHNOLOGY

3hrs/Week

#### THEORY :

1. Introduction: biotechnology and branches are allied to pharmaceutical industry, pharmacist and biotechnology, GMP compliance and bio-pharmaceutical facilities.
2. Immobilization: immobilization processes surface immobilization of cell. Biotechnological and pharmaceutical application of immobilization.  
Fermentation :
  - A. \*\*\*\*\* \*\*\*\* design, design of fermentation process, media, sterilizatoin, isolation, and purification with flowsheet for penicillins, sterptomycintetracyclin, vit B12, Alcohol, Citric acid.
  - B. Microbial bio transformation process with special reference to steroids. Production and applications of single cell proteins. Pharmaceutical applications of animal cell culture.
3. Immunology : immune system of body, coll and humoral immunity. T-cell, B-cell and accessory cell their role in immunity Anrigen-Antibody reaction and their applications
4. Types of immunity. Immunological products : Vaccines, Serums, and diognostic products. General methods of preparation of bacterial vaccine. Diphtheria vaccine, Cholera Vaccine, Fertusis, Typhoid, B.C.G., polymyletis vaccine. Tetanus Toxoid.
5. Monoclonal Antibodies and Ilybridoma, Technology : Introduction, formation and selection of Hybrid cells. Production of MAb. Advantage and limitations of Mab. Characterization formulation, quality control and applications of monoclonal antibodies.
6. Principals of Genetics : DNA, RNA, Chromosomes Structure replication. Gene Expression and protein synthesis. Genetic code DNA synthesis. Recombinant DNA technology : cutting and rejoining of DNA mutagenesis. PCR in gene amplification, gene cloning, gene expression and protein production. Application of recombinant DNA technology.
7. Delivery consideration of biotechnological products : introduction, delivery of protein and peptide drugs, brief overview of different approaches like : concepts of prodrug site specific delivery, concept of lipid vesicular deliveries particulate carriers deliveries using specialised routes- buccal, parentral, transdermals, rectal, Nasal, pulmonary, Microcapsules, Microspere, Aquasomes, Liposomes, Cellular carriers, self regulated systems, Mechanical pumps, antibody conjugates and other targeted deliveries.
8. Drug Delivery System in Gene Therapy : Gene Plasmids, vectors and reverse genetics. Different approaches for gene therapy, safety consideration. Design and application of some viral and non viral mediated gene delivery system.

## **BOOKS RECOMMENDED**

1. Biotechnology A to Z by Bains/Williams
2. Concepts of Biotechnology by Balasubramaniam
3. Pharmaceutical Biotechnology by Vyas and Dixit
4. Biotechnology by Crueger
5. Ramington's Pharmaceutical Science (latest edition)
6. Text book of Biotechnology by S.K. Jain
7. Genetic Engineering and its applications by Joshi, P.
8. Molecular Biotechnology by Primrose S.B.
9. Biotechnology : Fundamentals and Applications by Purohit S.S.
10. Molecular Biology and Biotechnology by Walker and Gingold.

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## SYLLABUS FOR THRID YEAR B.PHARM

### 303 MEDICINAL CHEMISTRY- I

3Hrs/Week

#### THEORY:

1. Basic principles of Medical Chemistry : Phyio-chemical aspects (Optical geometric and bioisomerism of drug molecules and biological action. Drug-receptor interaction including transaction mechanism and G proteins. Principles of drug design (Theoretical Aspects) : Traditional analog (QSAR) and mechanism based approaches (Introduction to graph theory, applications of quantum mechanics), Computer Added Drug Designing (CADD) and molecular modelling.
2. Synthetic Producers of Selected drugs : Mode of Action uses Structure Activity Relationship (SAR) including physiochemical properties of following classes of drugs should be covered. Biochemical approaches in drug designing wherever applicable should be discussed.
  - 2.1 Drugs acting at synaptic and neuro-effector junction sites :
    1. Cholergic and Anticholinesierases.
    2. Adrenergic drugs.
    3. \*\*\*\*\* and antiulcer drug.
    4. Neuromuscular blocking agents.  
SAR sympathomimictic amincs, Acctylecholinc, and antimuscaninics.  
Synthesis or Adrenaline, Noradrenaline, Isoprenaline, Salbutanol, Amphetmine Nephazpline, Phenylephrine, Methacholine chloride, Neostigmine bromide Pridostigmine, Cyclopentolate, Diclomine and Succinyl chlonic chloride.
  - 2.2 Autocoids :
    1. Antihistamincs
    2. Eicosaneids  
SAR of Antihistamines.  
Synthesis of Mepyarrtine Maleate, Diphenhydramine, Chlopheru\*\*\*\*\*. Promethazine, Chlorocyclizine, and Omeparazole, Pheniramine, Phenindamine, triprolidine, meclizine, cemetidine, astemizole, ranitidine, cyproheptidine.
  - 2.3 Drug affecting uterine motility.  
Oxytocis (including oitocin, ergot alkloids and prostagandins)
  - 2.4 Chemotherapeutic agents
    1. antibacterials : Antibiotics, Antiuricrobacterials, Sulphonamides. Quinolones, Antibacterials, Antimetabolites.
    2. Antivirals : AIDS, antioneogenic virals
    3. Antiricckettsials and Antimycoplasmals
    4. Antiprotozoles : Antimalarials, Antimoebics, other antiprotozoles
    5. Antifungal : Antibiotics, Synthatics
    6. Antimetazoles (Anthelmentics)
    7. Antiseptic and Disinfectants
    8. \*\*\*\*\*

SAR of Penicillines, Tetracyclines and Sulphonamides.

Synthesis of chloroquine, pyrimethamine, sulphadiazine, sulphamethoxazole, sulphaccramide. Trithoprim, cycloscrinc, chloramphenicol, nitrofurantoin, isoniazide, ethambutol, dapson and clofazimine, ampicilin, sulbacran \*\*\*\*\* acid.

- 2.5 \*\*\*\*\* agents  
2.6 Diagnostic agents

3 hrs/week

**PRACTICAL:**

1. Exercise based on QSAR : Hanech and Free Wilson methods.
2. Establishing the pharmacopoeial standards of the drug synthesis.
3. Determination of partition co-efficient, diaociation constants and molar refractivity of compounds for QSAR analysis.
4. Workshop on stereo models use of some selected drugs.
5. Synthesis of selected drugs form the course content involving two or more stops and their spectral analysis.
6. Establishing the pharmacopoeial standards of the drug synthesisted.

**BOOKS RECOMMENDED :**

- 1 Medicinal chemistry by Burger
- 2 Text book of organic medicinal and pharm, chemistry by Wilson and Gisvold
- 3 Principles of Medicinal Chemistry by Foye, Willams and Lemke
- 4 A hard book of organic analysis by Clarke
- 5 A text book of practical organic chemistry by Voget
- 6 Quantitative organic analysis by Cheronis.

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## SYLLABUS FOR THRID YEAR B.PHARM

### 304. PHARMACOLOGY – II (PHARMACOLOGY AND CHEMOTHERAPY)

3 hrs. / week

#### THEORY:

#### 1. **General pharmacology**

- a Introduction to pharmacology, sources of drugs, dosage forms and routes of administration. Mechanism of action, combined effect of drugs, factors modifying drug action, tolerance and dependence, pharmacogenetics, drug receptors, dose response relationship.
- b Absorption, distribution, Metabolism and excretion of drugs. Principle of basic and clinical pharmacokinetics. Adverse drug reactions and treatment of poisoning. ADME drug interactions.

#### 2. Pharmacology of peripheral nervous system:

- a Neurohumoral transmission (autonomic and somatic)
- b Parasympathomimetics, parasympatholytics, sympathomimetics, adrenergic receptor and neuron blocking agents, ganglionic stimulants and blocking agents.
- c Neuromuscular blocking agents.
- d Local anaesthetic agents.

#### 3. Autocoids :

- a Histaminic, 5-HT and their antagonists
- b Prostaglandins, thromboxane and leukotrienes
- c Pentagastrin, cholecystokinin, angiotensin, bradykinin and substance P.

#### 4. Chemotherapy :

- a. General principles of chemotherapy.
- b. Sulphonamides, co-trimoxazole, quinolones, nitrofurans
- c. Antibiotics : penicillins, cephalosporins, betalactams, tetracyclines, aminoglycosides, chloramphenicol, erythromycin and miscellaneous antibiotics.
- d. Chemotherapy of tuberculosis, leprosy, fungal disease, viral diseases, urinary tract infection and \*\*\*\*\* disease (STD)
- e. Chemotherapy of malignancy and immunosuppressive agents
- f. Chemotherapy of the parasitic diseases : helmentiasis, malaria, amoebiasis and other protozoal infections.

3 Hrs./week

#### PRACTICAL:

- 1 Introduction to experimental pharmacology.
  - 1.1 Preparation of different solutions for experiments
  - 1.2 Drug \*\*\*\*\* use or moalr and w/v solutions in experimental pharmacology.
  - 1.3 Common laboratory animals and anaesthetics used in animal studies.
  - 1.4 Commonly used instruments in experimental pharmacology.
  - 1.5 Some common and standard techniques. Bleeding and intravenous injection intragastric administration procedures for rendering animals unconscious, stunning of redents, pithing of frogs, chemical anaesthesia.

- 2 Experiments on intact preparations:
  - 2.1 Study of different routes of administration of drugs in mice/rats
  - 2.2 To study the effect of hepa\*\* microsomal enzyme inhibitors and induction on the pentobarbitone sleeping time in mice.
  - 2.3 Evaluation of local anaesthetics
- 3 To study the effect of autonomic drug on rabbit eye
- 4 To study the effects of various agonists and antagonists and their characterization using isolated preparation like frog's rectus abdominus muscle and isolated ileum preparation of rat guinea pig and rabbit.
- 5 Experiments on isolated preparation :
  - 5.1 To record the concentration response curve (CRC) of acetylcholine using rectus abdominus muscle preparation of frog.
  - 5.2 To study the effects of physostigmine and d-tubocurarine on the CRC of acetylcholine using rectus abdominus preparation of frog.
  - 5.3 To record the CRC of 5-HT on rat fundus strip preparation
  - 5.4 To record the CRC of histamine on guinea pig ileum.
  - 5.5 To record the CRC of noradrenaline on rat anococcygeus muscle.
  - 5.6 To record the CRC of oxytocin using rat uterus
  - 5.7 Pharmacology of cardiovascular system.
  - 5.8 To \*\*\*\*\* effects of drug on isolated & perfused frog heart.
  - 5.9 To study the effects of drugs on normal & hypodynamic frog heart.

**BOOKS RECOMMENDED:**

- 1 Pharmacological basis of therapeutics by Goodman & Gillman
- 2 Medical Pharmacology by Goth
- 3 Pharmacology by Gaddum
- 4 Pharmacology and pharmacotherapeutics by Satoshkar & Bhandarkar
- 5 Essentials of Pharmacotherapeutics by F.S.K. Barar
- 6 Lewis Pharmacology by Crosslam
- 7 Textbook of Pharmacology by Bowman & Rand
- 8 Essential of Medical Pharmacology by K. D. Tripathi
- 9 Pharmacology by Rang & Dale
- 10 Elements of Pharmacology by Dr.Derasari & Dr.Gandhi
- 11 Drug interactions by Hansten
- 12 Introduction to general toxicology by Aries Simonsis & Offermeler
- 13 Toxicology: The basic science of poisons by Casorell & Doull
- 14 Clinical Pharmacology by Lawrence
- 15 Principles of drug action by Goldstein Aronow & Kalaman
- 16 Drug Treatment by Aveyrey
- 17 Fundamentals of experimental Pharmacology by M.N. Ghosh
- 18 Handbook of experimental Pharmacology by S.K. Kulkarni
- 19 Pharmacological of experiments on isolated preparations by Perry
- 20 Practical in Pharmacology by Dr.Goyal

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## SYLLABUS FOR THRID YEAR B.PHARM

### 305. PHARMACOGNOSY-II

2hrs/week

#### THEORY:

1. Study of the biological sources, cultivation, collection, commercial varieties, chemical substitutes, adulterants, uses, diagnostic macroscopic features and specific chemical tests of following groups of glycosidal drugs
  - 1.1 Saponins : Glycyrrhiza, ginseng, Dioscorea, Sarsaparilla and seneqa
  - 1.2 Cardioactive sterols : Digitalis, Squills, Strophanthus, Thevetia
  - 1.3 Anthraquinone Cathartics : Aloe, Senna, Rhubarb and cascara
  - 1.4 Psoralea ammi gentian, saffron, chirata quassia
  
2. Study of the biological sources, cultivation, collection, commercial varieties, chemical constituents, substitutes, adulterants uses diagnostic macroscopic and microscopic features and specific chemical tests of following groups containing alkaloids.
  - 2.1 Pyridine – piperidine : Tobacco, Areca and Labelia
  - 2.2 Tropane : Belladonna, Hyoscyamus, Datura, Dubosia, Coca and Wihania
  - 2.3 Quinoline and isoquinoline : Cinchona, Ipecac and Opium
  - 2.4 Indole : Ergot, Rauwolfia, Cantharidin, Nux Vomica and physostigmine
  - 2.5 Imidazole : Pterocarpus
  - 2.6 Steroidal : Vorarum and urohin
  - 2.7 Alkaloidal amine : Ephedra and Colchicum
  - 2.8 Glycoalkaloid : Soanum
  - 2.9 \*\*\*\* coffee, tea and coca
  
3. Studies of traditional drugs : common vernacular names, botanical source morphology and chemical nature of chief constituents pharmacological categories and common uses of following \*\*\*\*\*:

Amla, Kanthari, Malkagni, Satavri, Tylophora, Bhilama, Kalijiri, Kener, Gaduchi, Brahmi, Adusa, Arjuna, Ashoka, Methi, Lahsun, Palash, Majith, Guggal, Godh, Kalimush, Taila, Rasma, Punarnava, Chitrak, Apamarg, Gkhru, Shamkhapushpi, Bahera, Chitra, Tulsi, Vdang, Cassia Tora.
  
4. Role of medicinal and aromatic plants in national economy
5. Biological sources preparation, identification tests and use of the following enzymes
6. Diastase papain, pepsin trypsin, paeceain
7. Marine pharmacology : studies on novel natural products from marine sources
8. Natural allergens and photosensitizing agents
9. Poisonous plants of India

3 hrs/week

#### PRACTICALS:

1. Identification of crude listed in theory by morphological characters
2. microscopical studies of some selected drugs mentioned in theory : Datura, Vasaka, Hyoscyamus, Belladonna, Cinchona, Ephedra, Ipecac, Rauwolfia, Nuxvomica, Vinca Digitalis Glycyrrhiza and Rhubarb

3. microscopical studies of selected powdered drugs of single or mixture of two to three components : Dhatura, Vasaka, Hysouamus, Belladonna, Withania, Cinchona, Ephedra, Ipepcae, Rauwolia, Vinca Disgitals, Glycyrrhiza and Rhubarb.
4. Identification of traditional drugs mentioned in theory by morphological and microscopically characters (where necessary)
5. T.L.C. & paper chromatography of some selected drug extractives mentioned in 2.
6. Identification of unorganized drugs mentioned in theory by morphological characters and chemical tests.

### **BOOKS RECOMMENDED :**

- 1 Pharmacognosy by G.E.Trease and W.C. Evans
- 2 Text book of pharmacognosy by T.E. Wallis
- 3 Pharmacognosy by \*\*\*\* Tylor L R Brady and J E Robbers
- 4 Text book of pharmacognosy by Dr C S Shah and Prof J S Sandry
- 5 Pharmacognosy by S S Handa and V K Kapoor
- 6 Pharmacognosy by Prof. C K Kokate, Prof A P Purohit & S B Gokhale
- 7 Text book of pharmacognosy by Dr Mahammed Ali
- 8 The wealth of India
- 9 Compendium of India Medicinal platn vol I, II, II & IV
- 10 Cultivation and utilization of Aromic Plants by Atal & Kapoor
- 11 Cultivation and utilization of medicinal plants by Atal & Kapoor
- 12 Text book of pharmacognosy by steininger and Hansel
- 13 Text book of pharmacognosy by Ramsted
- 14 Powdered vegetable drugs by B P Jeckson 7 D W Snewden
- 15 Biosynthetic products for cancer chemotherapy by George Paut Vol I, II, III Plenum press New York.
- 16 Natural products as Medicinal agents Edn. J L Beal and Reinhard Hippocrates Verleg
- 17 Medicinal plant glycosides Sim Toronto
- 18 Medicinal plant Alkaloids Sim Toronto
- 19 Ayurvedic pharmacopoeia
- 20 Practical pharmacognosy by lyenger
- 21 Practical pharmacognosy by Prof. C K Kokate
- 22 I.P.B.P.U.S.E.
- 23 British herbal pharmacoepia
- 24 Indian herbal pharmacoepia

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## SYLLABUS FOR THRID YEAR B.PHARM

### 306 COMMUNITY PHARMACY AND INCLUDING CLINICAL PHARMACY

2 hrs / week

#### **THEORY :**

#### **(I) COMMUNITY PHARMACY:**

Introduction to the concept of community pharmacy, its activities and professional responsibilities and professional in trade versus traders in profession.

Role of community pharmacist in health care system as per WHO guidelines.

Role of community pharmacies in primary health care services, family planning, first aid communicable diseases and non-communicable diseases.

Community pharmacist as health educator and role of community diseases like sexuality transmitted diseases and AIDS.

Community pharmacist as a source of drugs and poison information.

Prescribed medication order – interpretation and legal requirements.

Over the counter (OTC) drugs (non-prescription) and prescription drugs sales

The concept of essential drugs and rational drug use

Patient counseling general consideration, importance, steps and procedure involved.

#### **(II) CLINICAL PHARMACY**

Definition, scope, history and development of clinical pharmacy.

Introduction to clinical trials.

Role of the clinical pharmacist: drugs therapy monitoring: medication charles review, clinical review, therapeutic drug monitoring.

Parent data analysis: clinical laboratory tests use din the evaluation of common disease states, interpretation of test results of liver functions tests, pulmonary function tests, haemongram and renal function tests. The patient's case history, its structure and use in evaluation of drug therapy.

Patient compliance: factors, which affect compliance, method of measuring and improving drug compliance.

Individualistion of drug therapy.

Pharmacolog of placebos : Mode of action, uses and abuse adverse effect and factors which -----

General prescribing guidelines in paediatric and geriatric patients, pregnancy and lactation.

Clinical pharmacokinetics and dosage monitoring : Introduction to clinical pharmacokinetics physiologic pharmacokinetics model and its clinical applications, clearance renal clearance and non renal clearance, organ extraction and model of hepatic clearance. Estimation and determination of bio-availability, calculation of loading and maintenance dose, dose adjustment in renal failure, hepatic dysfunction, geriatric and pediatric patients.

#### **PRACTICALS**

3 hrs / week

- 1 Interpretation of prescriptions (five each of Govt. hospital and private hospital) to identify incompatibilities and irrationality.
- 2 Use of self-monitoring medial instruments like glucometer, BP apparatus, inhalers, sprays and diagnostic indicators.

- 3 Demonstration important technique like recording of BP, pulse, temperature, respiration rate, artificial respiration and parenteral drug administration.
- 4 Prepare questionnaire covering all aspects of selected disease like, T.B. Malaria, Diabetes, Cerebro-vascular diseases, asthma, diarrhoea, hepatitis and AIDS. Submit minimum ten duly answered questionnaire from the patient of any of the above diseases.
- 5 Prepare charts (minimum two) aiming to counsel patients suffering from the disease like AIDS, Cancer, Diabetes, T.B. Malaria, typhoid, dysentery and hypertension.
- 6 Students are to make case presentation on: on hypertension congestive cardiac failure, angina pectoris, asthma, COPD diabetes mellitus, peptic ulcer anemia tuberculosis, pneumonia, malaria, enteric fever, alcoholic liver disease, amoebiasis and hepatitis.
- 7 Patient medication history interview.
- 8 Patient medication counseling at least 2 exercises.
- 9 Answering \*\*\*\*\* questions at least 3 exercise
- 10 Case studies relating to laboratory investigations of haematology (anacenna). Liver function tests, thyroid function test, renal function tests and cardiac enzyme studies. Analysis of prescriptions for clinically significant drug-drug interaction at least 3 exercise.

#### **BOOKS RECOMMENDED:**

- 1 Remington's "The science of pharmacy" latest edition
- 2 Hospital Pharmacy by Hassan.
- 3 Clinical pharmacy & therapeutics by Rogar walker
- 4 Clinical use of drugs Brian S. Katcher
- 5 Melmon and Morrelli clinical pharmacology, S. George Carrathers
- 6 Clinical Pharmacology by Lawrence
- 7 Basic health education and community pharmacy by R. K. Goyal
- 8 Hand book of health education and community pharmacy by Gupta
- 9 Health education and community pharmacy by Dandiya & Zafa.

# VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

## SYLLABUS FOR THRID YEAR B.PHARM

### 307 PHARMACEUTICAL INDUSTRIAL MANAGEMENT

#### THEORY

3 hrs / week

- 1 Concept of management, administrative management (planning, organizing, staffing, directing and controlling) entrepreneurship development, operative management (personal, materials, production, financial, marketing time/space, margin/maral). Principles of management (co-ordination, communication, motivation, decision making, leadership, innovation, creativity, delegation of authority /responsibility and record keeping) identification of key points to give maximum thrust for development and perfection.
- 2 Accountancy: principles of accountancy, ledger posting and book entries, preparation of trial balance, columnar of a cash book, bank reconciliation statement, rectification of errors, profits and loss account, balance sheet, purchase, keeping and pricing of stocks, treatment of cheques bill of exchange, promissory notes and hundies and documentary bills.
- 3 Economics: Principles of economics with special reference to the laws of demand and supply, demand schedule, demand curves, labor welfare, general principles of insurances, inland and foreign trade, procedure of exporting importing goods.
- 4 Pharmaceutical marketing: function buying, selling, transportation storage, finance feedback, information, channels of distribution, wholesale, retail, department store, multiple shop and mail order business.
- 5 Economics: Principles of economics with special reference to the laws of demand and supply demand schedule demand curves, labour welfare, general principles of insurance, inland and foreign trade, procedure of exporting importing goods.
- 6 Pharmaceutical Marketing: Function buying, selling, transportation, storage, finance, feedback, information, channels of distribution, wholesale, retail, departmental store, multiple shop and mail order business.
- 7 Salesmanship: Principles of sales promotion, advertising, ethics of sales, merchandising, literature and detailing. Recruitment, training, evaluation and compensation to the pharmacist.
- 8 Market research: Prerequisites. Basic information services.
- 9 Material managements: A brief exposure to the basic principles of material managements, purchase, stores and inventory control (eligibility, efficiency, evaluation, recruitment methodology, service conditions, termination, performance evaluation etc.)
- 10 Production management: A brief exposure of the different aspects of production management (visible and invisible) inputs, methodology of activities, performance

evaluation techniques process – flow. Process know- how and maintenance management.

- 11 Factors to be considered for ideal location to setup a pharmaceutical industrial unit.

**BOOKS RECOMMENDED:**

1. J. A. Stoner, R. E. Freeman & D. R. Gilbert “Management” Prantice Hall, New Delhi
2. P. Kotler, “Marketing Management analysis, planning, implementation & control” Prantice Hall, New Delhi
3. H. A. Smith, “Principles and method of Pharmacy Management”, Lea & Febiger, Philadelphea
4. P. Gopalkrishnan & M. Sundarshan, “Material Management: An Integrated approach”, Prantice Hall, New Delhi
5. C.B.Mannoria, Personal Management, Himalaya Publishing house, Bombay
6. L. Lachman, H. A. Lieberman and J. L. Kanic, “Theory & Practical of Industrial Pharmacy”, Lea & Febiger, U.S.A.
7. P. Kotler, “Principles of Marketing” Prantice Hall, New Delhi
8. Remington’s Pharmaceutical science – Latest Edition.