

Course Description

BP 303 T. PHARMACEUTICAL MICROBIOLOGY (Theory)

45Hours

Scope:

- Study of all categories of microorganisms especially for the production of alcohol antibiotics, vaccines, vitamins enzymes etc..

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

1. Understand methods of identification, cultivation and preservation of various microorganisms
2. To understand the importance and implementation of sterilization in pharmaceutical processing and industry
3. Learn sterility testing of pharmaceutical products.
4. Carried out microbiological standardization of Pharmaceuticals.
5. Understand the cell culture technology and its applications in pharmaceutical industries.

Course content:

Unit I

10 Hours

Introduction, history of microbiology, its branches, scope and its importance.

Introduction to Prokaryotes and Eukaryotes

Study of ultra-structure and morphological classification of bacteria, nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve, isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count).

Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy.

Unit II

10 Hours

Identification of bacteria using staining techniques (simple, Gram's & Acid fast staining) and biochemical tests (IMViC).

Study of principle, procedure, merits, demerits and applications of physical, chemical gaseous, radiation and mechanical method of sterilization.

Evaluation of the efficiency of sterilization methods.



Equipments employed in large scale sterilization.

Sterility indicators.

Unit III

10 Hours

Study of morphology, classification, reproduction/replication and cultivation of Fungi and Viruses.

Classification and mode of action of disinfectants

Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions

Evaluation of bactericidal & Bacteriostatic.

Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.

Unit IV

08 Hours

Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification.

Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids.

Assessment of a new antibiotic.

Unit V

07Hours

Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage.

Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations.

Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures.

Application of cell cultures in pharmaceutical industry and research.



BP 307P.PHARMACEUTICAL MICROBIOLOGY (Practical)

4 Hrs/week

1. Introduction and study of different equipments and processing, e.g., B.O.D. incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, refrigerator, microscopes used in experimental microbiology.
2. Sterilization of glassware, preparation and sterilization of media.
3. Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations.
4. Staining methods- Simple, Grams staining and acid fast staining (Demonstration with practical).
5. Isolation of pure culture of micro-organisms by multiple streak plate technique and other techniques.
6. Microbiological assay of antibiotics by cup plate method and other methods
7. Motility determination by Hanging drop method.
8. Sterility testing of pharmaceuticals.
9. Bacteriological analysis of water
10. Biochemical test.

Recommended Books (Latest edition)

1. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.
2. Prescott and Dunn., Industrial Microbiology, 4th edition, CBS Publishers & Distributors, Delhi.
3. Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill edn.
4. Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.
5. Rose: Industrial Microbiology.
6. Probisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan
7. Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.
8. Peppler: Microbial Technology.
9. I.P., B.P., U.S.P.- latest editions.
10. Ananthnarayan : Text Book of Microbiology, Orient-Longman, Chennai
11. Edward: Fundamentals of Microbiology.
12. N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi
13. Bergeys manual of systematic bacteriology, Williams and Wilkins- A Waverly company



BP 408 P.PHARMACOLOGY-I (Practical)

4Hrs/Week

1. Introduction to experimental pharmacology.
2. Commonly used instruments in experimental pharmacology.
3. Study of common laboratory animals.
4. Maintenance of laboratory animals as per CPCSEA guidelines.
5. Common laboratory techniques. Blood withdrawal, serum and plasma separation, anesthetics and euthanasia used for animal studies.
6. Study of different routes of drugs administration in mice/rats.
7. Study of effect of hepatic microsomal enzyme inducers on the phenobarbitone sleeping time in mice.
8. Effect of drugs on ciliary motility of frog oesophagus
9. Effect of drugs on rabbit eye.
10. Effects of skeletal muscle relaxants using rota-rod apparatus.
11. Effect of drugs on locomotor activity using actophotometer.
12. Anticonvulsant effect of drugs by MES and PTZ method.
13. Study of stereotype and anti-catatonic activity of drugs on rats/mice.
14. Study of anxiolytic activity of drugs using rats/mice.
15. Study of local anesthetics by different methods

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

Recommended Books (Latest Editions)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology



BP 404 T. PHARMACOLOGY-I (Theory)

45 Hrs

Scope: The main purpose of the subject is to understand what drugs do to the living organisms and how their effects can be applied to therapeutics. The subject covers the information about the drugs like, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with the adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes of drugs.

Objectives: Upon completion of this course the student should be able to

1. Understand the pharmacological actions of different categories of drugs
2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
4. Observe the effect of drugs on animals by simulated experiments
5. Appreciate correlation of pharmacology with other bio medical sciences

Course Content:

UNIT-I

08 hours

1. General Pharmacology

- a. Introduction to Pharmacology- Definition, historical landmarks and scope of pharmacology, nature and source of drugs, essential drugs concept and routes of drug administration, Agonists, antagonists(competitive and non competitive), spare receptors, addiction, tolerance, dependence, tachyphylaxis, idiosyncrasy, allergy.
- b. Pharmacokinetics- Membrane transport, absorption, distribution, metabolism and excretion of drugs .Enzyme induction, enzyme inhibition, kinetics of elimination

UNIT-II

12 Hours

General Pharmacology

- a. Pharmacodynamics- Principles and mechanisms of drug action. Receptor theories and classification of receptors, regulation of receptors. drug receptors interactions signal transduction mechanisms, G-protein–coupled receptors, ion channel receptor, transmembrane enzyme linked receptors, transmembrane JAK-STAT binding receptor and receptors that regulate transcription factors, dose response relationship, therapeutic index, combined effects of drugs and factors modifying drug action.
- b. Adverse drug reactions.
- c. Drug interactions (pharmacokinetic and pharmacodynamic)
- d. Drug discovery and clinical evaluation of new drugs -Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and pharmacovigilance.



UNIT-III**10 Hours****2. Pharmacology of peripheral nervous system**

- a. Organization and function of ANS.
- b. Neurohumoral transmission, co-transmission and classification of neurotransmitters.
- c. Parasympathomimetics, Parasympatholytics, Sympathomimetics, sympatholytics.
- d. Neuromuscular blocking agents and skeletal muscle relaxants (peripheral).
- e. Local anesthetic agents.
- f. Drugs used in myasthenia gravis and glaucoma

UNIT-IV**08 Hours****3. Pharmacology of central nervous system**

- a. Neurohumoral transmission in the C.N.S. special emphasis on importance of various neurotransmitters like with GABA, Glutamate, Glycine, serotonin, dopamine.
- b. General anesthetics and pre-anesthetics.
- c. Sedatives, hypnotics and centrally acting muscle relaxants.
- d. Anti-epileptics
- e. Alcohols and disulfiram

UNIT-V**07 Hours****3. Pharmacology of central nervous system**

- a. Psychopharmacological agents: Antipsychotics, antidepressants, anti-anxiety agents, anti-manics and hallucinogens.
- b. Drugs used in Parkinsons disease and Alzheimer's disease.
- c. CNS stimulants and nootropics.
- d. Opioid analgesics and antagonists
- e. Drug addiction, drug abuse, tolerance and dependence.



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BP503.T. PHARMACOLOGY-II (Theory)

45 Hours

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

Objectives: Upon completion of this course the student should be able to

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

Course Content:

UNIT-I

10hours

1. Pharmacology of drugs acting on cardio vascular system

- a. Introduction to hemodynamic and electrophysiology of heart.
- b. Drugs used in congestive heart failure
- c. Anti-hypertensive drugs.
- d. Anti-anginal drugs.
- e. Anti-arrhythmic drugs.
- f. Anti-hyperlipidemic drugs.

UNIT-II

10hours

1. Pharmacology of drugs acting on cardio vascular system

- a. Drug used in the therapy of shock.
- b. Hematinics, coagulants and anticoagulants.
- c. Fibrinolytics and anti-platelet drugs
- d. Plasma volume expanders

2. Pharmacology of drugs acting on urinary system

- a. Diuretics
- b. Anti-diuretics.

UNIT-III

10hours

3. Autocoids and related drugs

- a. Introduction to autocoids and classification
- b. Histamine, 5-HT and their antagonists.
- c. Prostaglandins, Thromboxanes and Leukotrienes.
- d. Angiotensin, Bradykinin and Substance P.
- e. Non-steroidal anti-inflammatory agents
- f. Anti-gout drugs
- g. Antirheumatic drugs



UNIT-IV

08hours

5. Pharmacology of drugs acting on endocrine system

- a. Basic concepts in endocrine pharmacology.
- b. Anterior Pituitary hormones- analogues and their inhibitors.
- c. Thyroid hormones- analogues and their inhibitors.
- d. Hormones regulating plasma calcium level- Parathormone, Calcitonin and Vitamin-D.
- d. Insulin, Oral Hypoglycemic agents and glucagon.
- e. ACTH and corticosteroids.

UNIT-V

07hours

5. Pharmacology of drugs acting on endocrine system

- a. Androgens and Anabolic steroids.
- b. Estrogens, progesterone and oral contraceptives.
- c. Drugs acting on the uterus.

6. Bioassay

- a. Principles and applications of bioassay.
- b. Types of bioassay
- c. Bioassay of insulin, oxytocin, vasopressin, ACTH, d-tubocurarine, digitalis, histamine and 5-HT



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BP 507 P. PHARMACOLOGY-II (Practical)

4Hrs/Week

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

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

Recommended Books (Latest Editions)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill.
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins.
5. Mycek M.J., Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology.
6. K.D.Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert.
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan.



BP602 T. PHARMACOLOGY-III (Theory)

45 Hours

Scope: This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on respiratory and gastrointestinal system, infectious diseases, immuno-pharmacology and in addition, emphasis on the principles of toxicology and chronopharmacology.

Objectives: Upon completion of this course the student should be able to:

1. understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
2. comprehend the principles of toxicology and treatment of various poisonings and
3. appreciate correlation of pharmacology with related medical sciences.

Course Content:

UNIT-I

10hours

1. Pharmacology of drugs acting on Respiratory system

- a. Anti -asthmatic drugs
- b. Drugs used in the management of COPD
- c. Expectorants and antitussives
- d. Nasal decongestants
- e. Respiratory stimulants

2. Pharmacology of drugs acting on the Gastrointestinal Tract

- a. Antiulcer agents.
- b. Drugs for constipation and diarrhoea.
- c. Appetite stimulants and suppressants.
- d. Digestants and carminatives.
- e. Emetics and anti-emetics.

UNIT-II

10hours

3. Chemotherapy

- a. General principles of chemotherapy.
- b. Sulfonamides and cotrimoxazole.
- c. Antibiotics- Penicillins, cephalosporins, chloramphenicol, macrolides, quinolones and fluoroquinolones, tetracycline and aminoglycosides

UNIT-III

10hours

3. Chemotherapy

- a. Antitubercular agents
- b. Antileprotic agents



- c. Antifungal agents
- d. Antiviral drugs
- e. Anthelmintics
- f. Antimalarial drugs
- g. Antiamoebic agents

UNIT-IV

08hours

3. Chemotherapy

- l. Urinary tract infections and sexually transmitted diseases.
- m. Chemotherapy of malignancy.

4. Immunopharmacology

- a. Immunostimulants
 - b. Immunosuppressant
- Protein drugs, monoclonal antibodies, target drugs to antigen, biosimilars

UNIT-V

07hours

5. Principles of toxicology

- a. Definition and basic knowledge of acute, subacute and chronic toxicity.
- b. Definition and basic knowledge of genotoxicity, carcinogenicity, teratogenicity and mutagenicity
- c. General principles of treatment of poisoning
- d. Clinical symptoms and management of barbiturates, morphine, organophosphorus compound and lead, mercury and arsenic poisoning.

6. Chronopharmacology

- a. Definition of rhythm and cycles.
- b. Biological clock and their significance leading to chronotherapy.



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1. Dose calculation in pharmacological experiments
2. Antiallergic activity by mast cell stabilization assay
3. Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model.
4. Study of effect of drugs on gastrointestinal motility
5. Effect of agonist and antagonists on guinea pig ileum
6. Estimation of serum biochemical parameters by using semi- autoanalyser
7. Effect of saline purgative on frog intestine
8. Insulin hypoglycemic effect in rabbit
9. Test for pyrogens (rabbit method)
10. Determination of acute oral toxicity (LD50) of a drug from a given data
11. Determination of acute skin irritation / corrosion of a test substance
12. Determination of acute eye irritation / corrosion of a test substance
13. Calculation of pharmacokinetic parameters from a given data
14. Biostatistics methods in experimental pharmacology(student's t test, ANOVA)
15. Biostatistics methods in experimental pharmacology (Chi square test, Wilcoxon Signed Rank test)

**Experiments are demonstrated by simulated experiments/videos*

Recommended Books (Latest Editions)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs. The Point Lippincott Williams & Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology
6. K.D.Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P).Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata,
9. Kulkarni SK. Handbook of experimental pharmacology. VallabhPrakashan,
10. N.Udupa and P.D. Gupta, Concepts in Chronopharmacology.



BP 605 T. PHARMACEUTICAL BIOTECHNOLOGY (Theory)

45 Hours

Scope:

- Biotechnology has a long promise to revolutionize the biological sciences and technology.
- Scientific application of biotechnology in the field of genetic engineering, medicine and fermentation technology makes the subject interesting.
- Biotechnology is leading to new biological revolutions in diagnosis, prevention and cure of diseases, new and cheaper pharmaceutical drugs.
- Biotechnology has already produced transgenic crops and animals and the future promises lot more.
- It is basically a research-based subject.

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

1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
2. Genetic engineering applications in relation to production of pharmaceuticals
3. Importance of Monoclonal antibodies in Industries
4. Appreciate the use of microorganisms in fermentation technology

Unit I

10 Hours

- a) Brief introduction to Biotechnology with reference to Pharmaceutical Sciences.
- b) Enzyme Biotechnology- Methods of enzyme immobilization and applications.
- c) Biosensors- Working and applications of biosensors in Pharmaceutical Industries.
- d) Brief introduction to Protein Engineering.
- e) Use of microbes in industry. Production of Enzymes- General consideration - Amylase, Catalase, Peroxidase, Lipase, Protease, Penicillinase.
- f) Basic principles of genetic engineering.

Unit II

10 Hours

- a) Study of cloning vectors, restriction endonucleases and DNA ligase.
- b) Recombinant DNA technology. Application of genetic engineering in medicine.
- c) Application of r DNA technology and genetic engineering in the production of:
 - i) Interferon ii) Vaccines- hepatitis- B iii) Hormones-Insulin.
- d) Brief introduction to PCR




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Unit III

10 Hours

Types of immunity- humoral immunity, cellular immunity

- a) Structure of Immunoglobulins
- b) Structure and Function of MHC
- c) Hypersensitivity reactions, Immune stimulation and Immune suppressions.
- d) General method of the preparation of bacterial vaccines, toxoids, viral vaccine, antitoxins, serum-immune blood derivatives and other products relative to immunity.
- e) Storage conditions and stability of official vaccines
- f) Hybridoma technology- Production, Purification and Applications
- g) Blood products and Plasma Substitutes.

Unit IV

08Hours

- a) Immuno blotting techniques- ELISA, Western blotting, Southern blotting.
- b) Genetic organization of Eukaryotes and Prokaryotes
- c) Microbial genetics including transformation, transduction, conjugation, plasmids and transposons.
- d) Introduction to Microbial biotransformation and applications.
- e) Mutation: Types of mutation/mutants.

Unit V

07 Hours

- a) Fermentation methods and general requirements, study of media, equipments, sterilization methods, aeration process, stirring.
- b) Large scale production fermenter design and its various controls.
- c) Study of the production of - penicillins, citric acid, Vitamin B12, Glutamic acid, Griseofulvin,
- d) Blood Products: Collection, Processing and Storage of whole human blood, dried human plasma, plasma Substitutes.

Recommended Books (Latest edition):

1. B.R. Glick and J.J. Pasternak: Molecular Biotechnology: Principles and Applications of Recombinant DNA: ASM Press Washington D.C.
2. RA Goldshy et. al., : Kuby Immunology.
3. J.W. Goding: Monoclonal Antibodies.
4. J.M. Walker and E.B. Gingold: Molecular Biology and Biotechnology by Royal



T243 Pharmaceutical Microbiology (Theory)
(3Hrs/weeks)

Section I

1. Historical Development in Microbiology: Contributions of Antony Van Leevenhock, Louis Pasteur, Robert Koch, Alexander Fleming, Paul Ehrlich and Edward Jenner and Joshep Lister.	02
2. Characteristics of micro- organism : Virus ,Bacteria (Eubacteria, actinomycetes, Rickettia)Fungi, protozoa, and algae.	04
3. Structure of Micro-organism: Virus : Ultra structure of Helical, polyhydal and complex virus Bacteria : size and shapes ,ultra structure of bacterial cell , cell wall , (gram positive ,gram negative , and acid fast)Glycocalyx, flagella, Endospore (ultra structure)Plasmid and Nucloid Fungi : Yeast , (Caandida albicans, Aacchromyces sereviceiae) Mould (Penecillum sp , Asperagillus sp.)	06
4. Microscopy and Staining: Concept of magnification ,Numerical aperture and Resolution ,Immersion oil and its significance ,principles of staining,	04
5. Microbial Growth: Growth, curve Method of determination of growth, factors required for growth, : pH ,Temperature, osmotic pressure Oxygen Media (Synthetic and complex selective ,Enrichment Differential Media.) Isolation technique: Streak plate, Spread plate and pour plate.	07
6. Control of Microbes: Sterilization : TDP.TDT.DRT (D-value) Inactivation Factor, Z-value. Method of Sterilization: Dry heat, Moist heat, Radiation (Ionizing and No ionizing)Sterilents and filtration sterilization in pharmaceutical Industry ,Validation of Process Disinfection :Ideal disinfectant, Disinfectant, Mode of action and application of phenol and phenolic alcohol, Heave metals, Halogen detergent , Hydrogen Peroxide Antiseptic and preservative .	07

Section-II

7. Pharmaceutical Microbiology and Human Health: Definition and scope of Pharmaceutical Microbiology, Concept of infection, disease, immunity, Types of immunity, antigen, antibody, Epidemiology of disease, hypersensitivity, Concept of newly emerging disease (eg. SARS)	07
8. Techniques in Pharmaceutical Microbiology: Antimicrobial effectiveness testing, Microbial limit test, Pyrogen test, sterility test, Ames test, Microbial assay (Antibiotic and Vitamins), Phenol coefficient: (RW test and Chick Martin Test), MIC (Tube dilution method, Gradient plate method), Kirby-Bauer antibiotic sensitivity test and synergistic effect of drug.	12
9. Microbial Pharmaceuticals: General method for large scale production of Antibiotic , Vitamins and Vaccine. Antibiotic: Type, source, mode of action, Application. Vitamins: Type, source, Applications. Vaccine and Toxoid: DNA vaccine, Edible vaccine.	09
10. Microbial Quality control and Quality Assurance: Concept of Bio-safety, Sterile manufacturing unit, LAF. Storage and Stability of Medicine- Microbiological view.	02

Total Hours: 45

Books Recommended:

1. J.C.Black -- Microbiology Principles and Examinations, John wiley and sons
2. Frobisher -- Fundamentals of Microbiology
3. Ulhas Patil, J.S.Kulkarni-- Foundations in Microbiology
4. Stephan P. Denyer, N.A.Hodges, S.P.Gormao-- Hugo and Rusell'sPharmaceutical Microbiology
5. J.L.Ingraham, C.A.Ingraham.-- Introduction to Microbiology
6. Pleezar, Chan And Krig.-- Microbiology
7. Torrontam.-- Foundation in Microbiology
8. IP 1996, BP 2003, USP2004
9. Cooper and Gun -- Tutorial Pharmacy



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**P243 Pharmaceutical Microbiology
(Practical)**

1. Introduction Lab Instruments: Autoclave, Hot air oven, Incubator, shaking incubator, Anaerobic jar, pHmeter, Antibiotic zone reader, Colony counter, Refrigerator.* 2. Compound Microscope* 3. Monochrome Staining** 4. Gram Staining** 5. Streak plate method** 6. Pour plate method** 7. Sterility test- Direct inoculation method (Sterile injectable, Sterile devices)** 8. Microbial assay – Diffusion assay (Penicillin)** 9. Microbial assay—Turbidometric (Streptomycin)** 10. RW Test (Dettol)** 11. Study of Oligodynamic action** 12. Kirby-Baner antibiotic sensitivity test** 13. Air micro flora** 14. Microbial limit test (Water)** 15. Minimum Inhibitory Concentration of aqueous garlic extract (Tube dilution method) ** 16. Study of permanent slides of yeast , Aspergillus and Penicillium. *	
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* Indicate minor experiments

** Indicate Major experiments

Books Recommended:

1. Cappuccino and Sherman—Microbiology of laboratory manual, Pearson Education
2. Indian Pharmacopoeia- 1996
3. Herold Benson – Applications in Microbiology

Scheme for practical Examination

Sr.No.	Head	Sessional	Annual
1	Synopsis	05	10
2	Major experiment	07	35
3	Minor experiment	04	15
4	Viva	04	10
5	Journal & Attendance	10	-
	Total	30	70
	Duration	03 Hrs	4 Hrs




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T353 Pharmacology-I (Theory)

(3hrs/Week)

Sr. No.	Topic	No of Hrs
	Section-I	
1.	General pharmacology	
	a) Introduction and definition, history, sources of drugs.	02
	b) Routes of administration of drugs.	02
	c) Absorption of drugs and Biological factors affecting them.	02
	d) Drug distribution, Bio-transformation and excretion	03
	e) Mechanism of drug action – molecular and biochemical receptors and drug-receptor interactions, Theories for receptor mediated action. Concept of pD ₂ . Signal transduction process. Dose response relationship, structure-activity relationship	10
	f) Factors modifying drug effects- Synergism, Antagonism, Drug Tolerance, Tachyphylaxis.	05
	Section-II	
	General pharmacology-	04
	g) Drug toxicity-Toxicity studies in Animals, ADR in Man.	
Note:- The Term Pharmacology used hereafter and in examinations refers to the classification, mechanism of action, pharmacokinetics, Pharmacodynamics, adverse effects, contraindication, therapeutic uses and dosage.		
2.	Pharmacology of drugs acting on Autonomic Nervous System	
	a) Introduction- neurohumoral transmission	02
	b) Adrenergic and cholinergic receptors	02
	c) Adrenergic drugs-bronchodilators and nasal decongestants	03
	d) Adrenergic receptor blockers, Adrenergic neuron blockers	02
	e) Cholinomimetics, Anti-cholinesterases and Drugs used in Myasthenia gravis	04
	f) Antimuscarinic agents	02
	g) Ganglionic blockers and stimulants	01
	h) Neuromuscular blocking agents	01
	Total Hrs.	45

Books Recommended

- 1) Satoskar R.S, Bhandarkar S.D, Rage N.N. Pharmacology and Pharmacotherapeutics. Popular Prakashan Mumbai 19th edition
- 2) Barar F.S.K. Essentials of Pharmacotherapeutics, S.Chand & Company Ltd. New Delhi
- 3) Tripathi K.D. Essentials of medical Pharmacology, Jaypee New Delhi 2004 5th edition
- 4) Rang H.P., Dale M.M. *et.al.* Pharmacology. Churchill Livingstone, New Delhi 2005 5th edition
- 5) Katzung B.G .Basic & Clinical Pharmacology Mc-graw Hill, New Delhi 2001. 8th edition.
- 6) Lewis's Pharmacology. Churchill Livingstone London, 1980 5th edition
- 7) Goodman Gilman, The Pharmacological basis of therapeutics. Mc-graw Hill New Delhi 2001 10th edition
- 8) Seth S.D. Textbook of Pharmacology Elsevier, New Delhi 2004 2nd Edition




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- 9) Harvey R.A., Champe P.C. Lippincott's Illustrated Reviews-Pharmacology. Lippincott Williams & Wilkins , Pennsylvania. 2000 2nd edition .
- 10) Grahame-Smith D.G. & Aronson J.K. Oxford textbook of clinical Pharmacology and drug therapy . Oxford University press London. 2002 3rd edition
- 11) Foster R.W. Basic Pharmacology, Arnold ,New Delhi 2001 ,4th edition
- 12) Stahl S.M.. Essential Psychopharmacology Cambridge University Press New Delhi 2003 2nd edition
- 13) DiPiro J.L. Pharmacotherapy Handbook. Tata McGraw Hill New Delhi.2004 5th edition.
- 14) Official books - Indian Pharmacopoeia, British Pharmacopoeia, United States Pharmacopoeia.
- 15) P.N.Patil, O.D.Gulati, R.Balaraman, Topics in The History of Pharmacology, B.S.Shah Prakashan, Ahmedabad.

P353 Pharmacology-I (Practicals)
(3hrs/Week)

- 1) Study of laboratory animals and various preparations of them used in animal experimentation.
- 2) Study of laboratory appliances used in experimental pharmacology.
- 3) Study of various physiological salt solutions used in experimental pharmacology.
- 4) To establish Dose Response Curve of any **three** agonists using suitable animal tissue preparation.**
- 5) To study the shift in D.R.C by Antagonists for above agonists-covering concept of Reversible and irreversible antagonism.**
- 6) To determine PD_2 value **
- 7) To study the various effects of drugs on Isolated frog heart using in silico model
(Ex- Pharm^o, X^c Cology or any such Soft-ware)*

NOTES

1. Minor * Major**

2. Suitable animal preparation- Any experiment suitable to demonstrate the concept- It could be either in-vivo or in-vitro, The animal selected may be mice, rat, rabbit, guinea pig as admissible as per prevailing Government/CPCSEA guidelines. In case of in-vitro preparations- any tissue preparation from above animals or various tissues from goat may be obtained from slaughter house/ abattoir /butcher shop

3. Agonist- Any agonist that can exhibit activity using the given preparation as reported in standard books/journals may be selected e.g.-Adrenaline and other catecholamines, Acetyl Choline, Histamine, Serotonin, oxytocin etc.

4. Antagonist- Any antagonist that can exhibit blocking activity of above mentioned agonists in the given preparation as reported in standard books/journals may be selected.

Minimum 12 experiments from above list must be conducted

Examination Pattern is as follows

Sr. No.	Types of Question	Sessional	University
	Duration	3 Hrs	4 Hrs
1	Synopsis	5	10
2	Viva Voce	5	10
3	Exp. Major	-	30
	Minor	10	20
4	Journal Marks	10	-
	Total Marks	30	70

Books Recommended

- 1) Ghosh M.N. Fundamentals of Experimental pharmacology. Hilton & Company Kolkata 2005 3rd edition.
- 2) Vogel G.H. Drug discovery and evaluation. Springer Germany 2002 2nd edition.
- 3) Goyal R.K. Practicals in pharmacology. B.S. Shah Prakashan Ahmedabad 2005 5th edition.




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- 4) Kulkarni S.K. Handbook of Experimental Pharmacology. Vallabh Prakashan. New Delhi, 5th edition.
- 5) Perry W. L. M. Pharmacological Experiments on Isolated preparations. E.&S.Livingstone, London 1970, 2nd edition.
- 6) Kasture S.B. Text book of Experimental Pharmacology, Career Publication Nashik. 1st edition, 2006.
- 7) Official books - Indian Pharmacopoeia, British Pharmacopoeia, United States Pharmacopoeia.



P363 Pharmacology-II (Practicals)
45 Hours (3hrs/Week)

- 1) To perform Bio-assay of following drugs using following methods**
 - a) Graphical/Interpolation method
 - b) Matching method
 - c) Three point method
 (Bio-assay of Acetylcholine, Histamine)
- 2) CNS experiments*
 - a) Care and handling of common laboratory animals.
 - b) Introduction to animal physiology with their biochemical reference value in various animal species.
 - c) Study of various anaesthetics employed to anesthetize the laboratory animal.
 - d) Introduction to techniques of euthanasia, stunning, pithing etc.
 - e) Study of various routes of administration using various animals.
 - f) To study the Hypnotic property of drug/drugs using mice/rats as experimental animals (Different routes of drug administration can also be opted)
 - g) To study the drug induced catatonia in animals (Any one animal model-like baclofen/clonidine/haloperidol/pentazocine induced)
 - h) To study the effects of drugs on locomotor activity using Actophotometer
 - i) To study the Analgesic activity using suitable method. (Hot Plate, Tail Flick/Caudal Immersion, Acetic Acid/Formalin-Induced)
 - j) To study Anticonvulsant activity using MES/ PTZ..
 - k) To study drug antagonism on Isoalted frog heart preparation using softwares (Expharm, X-cology)

NOTES:- 1. Minor * Major**

2. Suitable animal preparation- Any experiment suitable to demonstrate the concept- It could be either in-vivo or in-vitro, The animal selected may be mice, rat, rabbit, guinea pig as admissible as per prevailing Government/CPCSEA guidelines. In case of in-vitro preparations- any tissue preparation from above animals or various tissues from goat may be obtained from slaughter house/ abattoir /butcher shop
Minimum 12 experiments from above list must be conducted

Examination Pattern is as follows

Sr. No.	Types of Question	Sessional	University
	Duration	3 Hrs	4 Hrs
1	Synopsis	5	10
2	Viva Voce	5	10
3	Exp. Major	-	30
	Minor	10	20
4	Journal Marks	10	-
	Total Marks	30	70

Books Recommended

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- 10) Grahame-Smith D.G. & Aronson J.K. Oxford textbook of clinical Pharmacology and drug therapy . Oxford University press London. 2002 3rd edition
- 11) Foster R.W. Basic Pharmacology, Arnold ,New Delhi 2001 ,4th edition
- 12) Stahl S.M.. Essential Psychopharmacology Cambridge University Press New Delhi 2003 2nd edition
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P473 Pharmacology III (Practical)

(3hrs/Week)

- 1) To perform **Bio-assays** antagonists like Atropine, d-tubocurarine using suitable biological preparations**
- 2) To determine **PA2** value of Atropine using suitable isolated tissue preparation. **
- 3) **Minor Experiment**
 1. Measurement of Na⁺, K⁺ content of urine by flame photometry*.
 2. To study Local anesthetic activity*
 3. To study laxative and anti diarrhoeal effects*
 4. To study mydriatic and miotic activity*
 5. To study Anti-inflammatory property of any NSAIDS against Carrageenan-induced acute paw oedema in Rat.
 - 6 To study the various effects of drugs using In-silico model (Effects of drug on B.P) (Ex- Pharm Software, X-cology)*

NOTES:-

1. Minor * Major**

2.Suitable animal preparation- Any experiment suitable to demonstrate the concept- It could be either in-vivo or in-vitro, The animal selected may be mice, rat, rabbit, guinea pig as admissible as per prevailing Government/CPCSEA guidelines. In case of in-vitro preparations- any tissue preparation from above animals or various tissues from goat may be obtained from slaughter house/ abattoir /butcher shop

Examination Pattern is as follows

Sr. No.	Types of Question	Sessional	University
	Duration	3 Hrs	4 Hrs
1	Synopsis	5	10
2	Viva Voce	5	10
3	Exp. Major	-	30
	Minor	10	20
4	Journal Marks	10	-
	Total Marks	30	70

Books Recommended

1. Ghosh M.N. Fundamentals of Experimental pharmacology. Hilton & Company Kolkata 2005 3rd edition
2. Vogel G.H. Drug discovery and evaluation. Springer Germany 2002 2nd edition
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4. Kulkarni S.K. Handbook of Experimental Pharmacology. Vallabh Prakashan. New Delhi, 5th edition
5. Perry W. L. M. Pharmacological Experiments on Isolated preparations.E.&S. LivingstoneLondon 1970 ,2nd edition
6. Kasture S.B.Text book of Experimental Pharmacology, Career Publication Nashik.1 st edition, 2006
7. Official books - Indian Pharmacopoeia, British Pharmacopoeia, United States Pharmacopoeia




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Activity Report



President :
Shri. Amrishbhai R. Patel
M.L.C.

Principal :
Dr. S. B. Bari
M.Pharm. Ph.D., D.I.M.F.I.C.

Activity report

Submitted to

The Principal,

H. R. Patel Institute of Pharmaceutical Education and Research, Shirpur

Name of Activity	Bharat 2047 Voice of Youth Consultation Online Program
Organizer	H. R. Patel Institute of pharmaceutical Education and Research Shirpur.
Venue	Third Floor B. Pharm Class Room No. 1, HRPIPER, Shirpur
Date of activity	11 th December 2023
Objectives	To achieve the goal of Viksit Bharat, the government will focus on improving people's capabilities and empowering them.
In charge	Mr. N. P. Pawar
Number of Participant	38
Brief Report on activity	Bharat 2047 Voice of Youth Consultation Program developed by University Grants Commission, New Delhi has been conducted online at HR Patel Pharmacy College Shirpur today on 11th December 2023 at 10:30 AM. Principal Dr. S. B. Bari for this program was attended by student development officers, professors, non-teaching staff, and students in large numbers.
Photograph Of activity	

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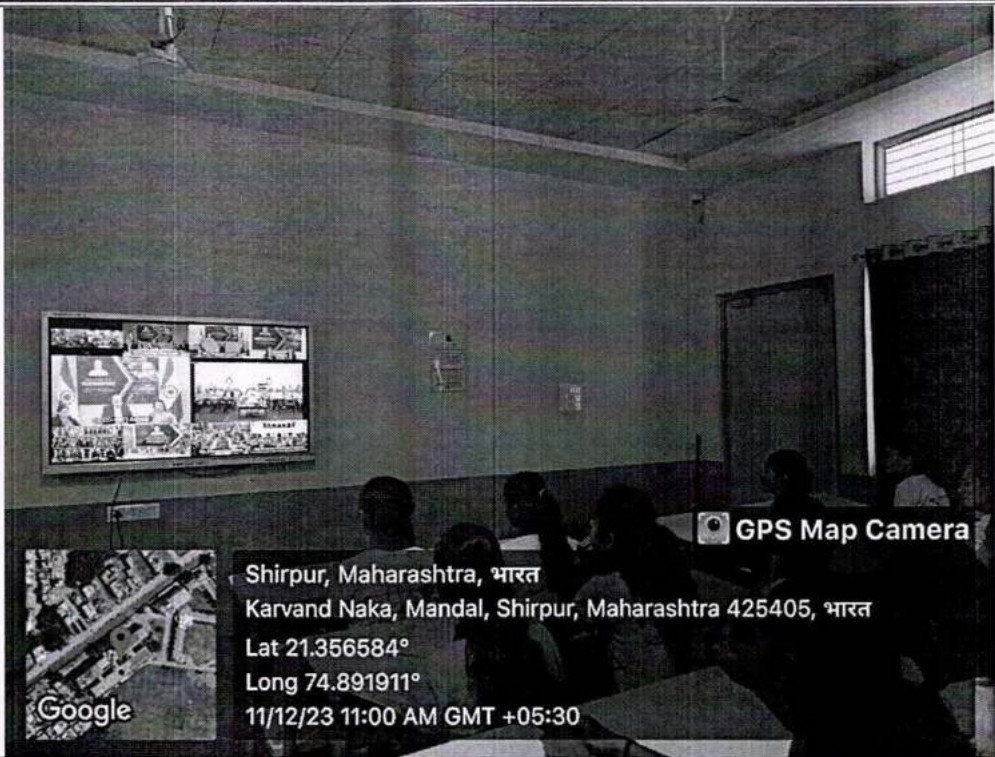
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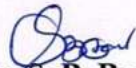
President :
Shri. Amrishbhai R. Patel
M.L.C.

Principal :
Dr. S. B. Bari
M.Pharm. Ph.D., D.I.M.F.I.C.

	 <p>Shirpur, Maharashtra, भारत Karvand Naka, Mandal, Shirpur, Maharashtra 425405, भारत Lat 21.356584° Long 74.891911° 11/12/23 11:00 AM GMT +05:30</p> <p>Google</p> <p>GPS Map Camera</p>
Outcome	The Viksit Bharat @2047: Voice of Youth was launched to realise the vision of Viksit Bharat, which demands a firm belief in India's destiny, unwavering dedication and a profound recognition of the people's vast potential capabilities and talent, particularly the youth.


Mr. N. P. Pawar
Student development Officer




Dr. S. B. Bari
Principal
H.R.Patel Institute of Pharmaceutical
Education & Research,
Shirpur Dist Dhule (M.S.) 425 405

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President :
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M.L.C.


Principal :
Dr. S. B. Bari
M.Pharm. Ph.D., D.I.M.F.I.C.

Activity report

Submitted to

The Principal,

H. R. Patel Institute of Pharmaceutical Education and Research, Shirpur

Name of Activity	One day seminar on "Women's Health Enhancement Seasonal Campaign."
Organizer	H. R. Patel Institute of pharmaceutical Education and Research Shirpur.
Venue	HRPIPER
Date of activity	3 rd January 2024
Objectives	Educate participants about the importance of women's health, particularly in the context of seasonal changes. Discuss specific health challenges faced by women during different seasons and provide strategies for prevention and management. Raise awareness about the "Women's Health Enhancement Seasonal Campaign."
In charge	Mr. N. P. Pawar
Number of Participant	89
Brief Report on activity	A guest lecture was held on the topic of "Women's Health Enhancement Seasonal Campaign." A guest lecturer for this Seminar Dr. Supriya Pantvaidya madam and Dr. Manisha Gaud madam was welcomed by the principal of the college Dr. S. B. Bari presented the bouquet. The direction of the lecture was steered by the students of Khopragade College, while gratitude was expressed by Prof. N. P. Pawar. The lecture was attended by all women's staff, and girl students of the college. Dr. Supriya Pantvaidya madam madam and Dr. Manisha Gaud madam share the importance of women's health, particularly in the context of seasonal changes.
Photograph Of activity	 <p>GPS Map Camera</p> <p>Shirpur, Maharashtra, India Shri padmavati nagar, Shahada road Near pharmacy college, in front of Recreation Garden, Mandal, Shirpur, Maharashtra 425405, India Lat 21.354704° Long 74.893475° 03/01/24 12:47 PM GMT +05:30</p>

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President :
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M.L.C.

Principal :
Dr. S. B. Bari
M.Pharm. Ph.D., D.I.M.F.I.C.




Outcome

Gain a comprehensive understanding of the unique health challenges faced by women during different seasons. Engage in constructive discussions and knowledge-sharing sessions with experts, peers, and stakeholders in the field of women's health.


Mr. N. P. Pawar
Student development Officer




Dr. S. B. Bari
Principal
H.R.Patel Institute of Pharmaceutical
Education & Research,
Shirdpur Dist Dhule (M.S.) 425 405

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M.L.C.


Principal :
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M.Pharm. Ph.D., D.I.M.F.I.C.

Activity report

Submitted to

The Principal,

H. R. Patel Institute of Pharmaceutical Education and Research, Shirpur

Name of Activity	Women's Health Checkup Camp at Lauki
Organizer	H. R. Patel Institute of pharmaceutical Education and Research Shirpur.
Venue	Lauki Tal-Shirpur
Date of activity	10 January 2024
Objectives	To provide women in the community with access to comprehensive health screenings. To assess hematological parameters, including CBC and total blood count, to identify any abnormalities or health concerns. To offer medical expertise and guidance through the checkup conducted by Dr. Sachin Shah from Shradha Clinical Laboratory. To engage College SDD and NSS students in community service and health promotion activities.
In charge	Mr. N. P. Pawar, Mrs. Sonal Shah
Number of Participant	60
Brief Report on activity	A women's health checkup camp was held at Lauki, tal- shirpur. Hematological parameters, including CBC and total blood count, were determined during the camp. Dr. Sachin Shah from Shradha Clinical Laboratory conducted the checkup. College SDD and NSS students assisted in ensuring the smooth conduction of the camp.
Photograph Of activity	 <p>GPS Map Camera</p> <p>Lauki, Maharashtra, India CW6W+HHM, Lauki, Maharashtra 425405, India Lat 21.411383° Long 74.946362° 10/02/24 12:49 PM GMT +05:30</p> <p>Google</p>

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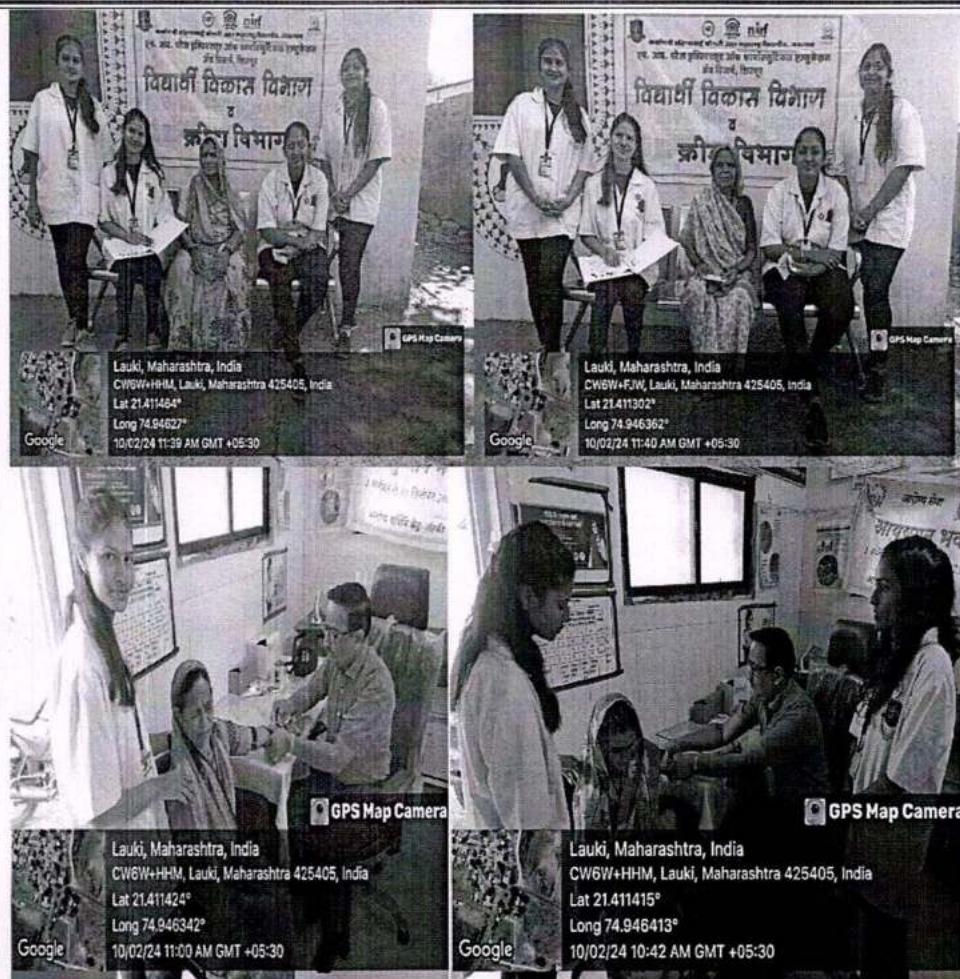
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President :
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M.L.C.

Principal :
Dr. S. B. Bari
M.Pharm. Ph.D., D.I.M.F.I.C.



Outcome

Identification of any abnormalities or health concerns related to hematological parameters through CBC and total blood count screenings. Increased awareness among women in the community about the importance of regular health checkups and early detection of health issues. Enhanced community engagement and collaboration between healthcare professionals, educational institutions, and the local community for promoting women's health and well-being.

R.P.
Mr. N. P. Pawar
Student development Officer



S.B.
Dr. S. B. Bari
Principal
H.R. Patel Institute of Pharmaceutical
Education & Research,
Shirdpur Dist Dhule (M.S.) 425 405

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M.L.C.


Principal :
Dr. S. B. Bari
M.Pharm. Ph.D., D.I.M.F.I.C.

Activity report

Submitted to

The Principal,

H. R. Patel Institute of Pharmaceutical Education and Research, Shirpur

Name of Activity	Guest Lecture on Women's Awareness Campaign on Menstruation
Organizer	H. R. Patel Institute of pharmaceutical Education and Research Shirpur.
Venue	HRPIPER
Date of activity	18 January 2024
Objectives	Educate participants about the importance of women's health, particularly in the context of seasonal changes. Discuss specific health challenges faced by women during different seasons and provide strategies for prevention and management. Raise awareness about the "Women's Health Enhancement Seasonal Campaign."
In charge	Mr. N. P. Pawar and Mrs. Sonal Shah
Number of Participant	37
Brief Report on activity	A guest lecture was held on the topic of " Women's Awareness Campaign on Menstruation." A guest lecturer for this Mrs. Pratibha Chaudhari madam was welcomed by the Mrs. Sonal Shah presented the bouquet. The direction of the lecture was steered by the students of Khopragade College, while gratitude was expressed by Prof. N. P. Pawar. The lecture was attended by all women's staff, and girl students of the college. Mrs. Pratibha Chaudhari madam shares the importance of women's health, particularly in the context of Menstruation period.
Photograph Of activity	 <p>REDMI NOTE 8 PRO AI QUAD CAMERA</p> <p>18/01/2024 15:29</p>



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President :
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M.L.C.

Principal :
Dr. S. B. Bari
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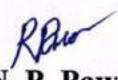


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Outcome

Gain a comprehensive understanding of the unique health challenges faced by women during different seasons. Engage in constructive discussions and knowledge-sharing sessions with experts, peers, and stakeholders in the field of women's health.


Mr. N. P. Pawar
Student development Officer




Dr. S. B. Bari
Principal
H.R. Patel Institute of Pharmaceutical
Education & Research,
Shirpur Dist Dhule (M.S.) 425 405


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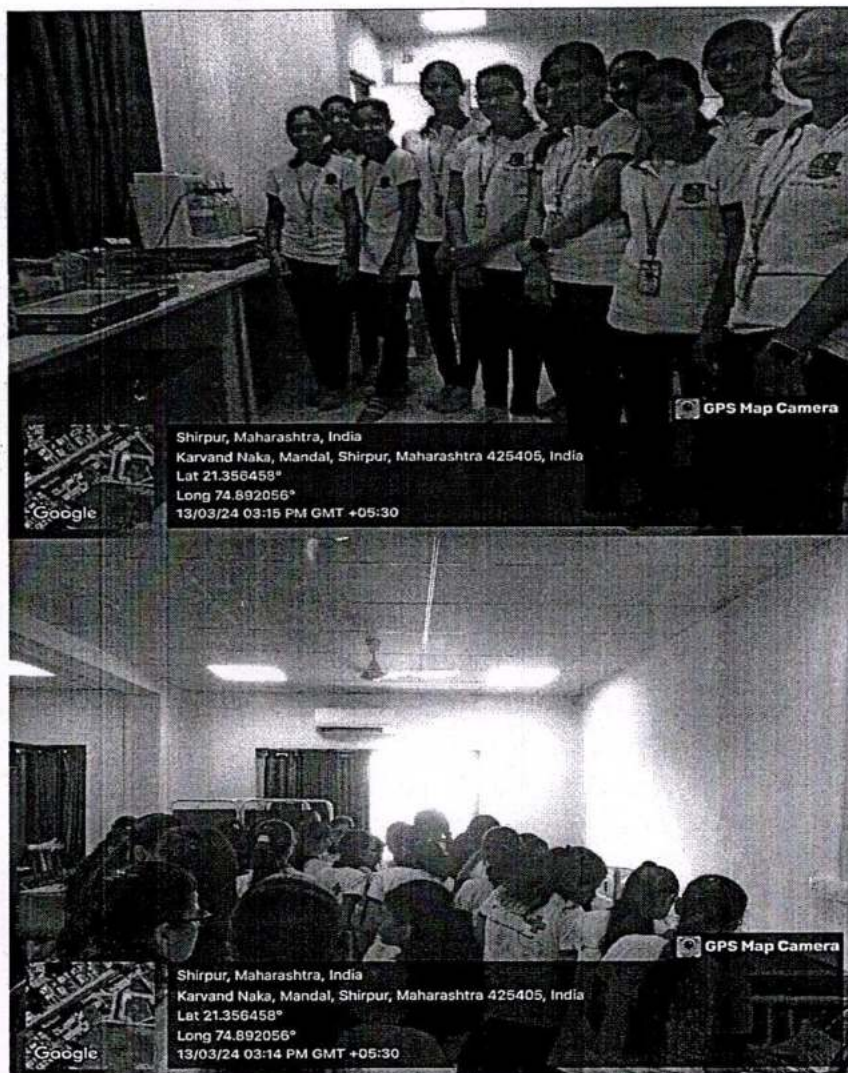
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Name of Activity	Women Employment visit at hospital
Organizer	Student Development Department of KBCNMU, Jalgaon, and HRPIPER, Shirpur Organized jointly
Venue	Third floor Primary Health Care Hospital HRPIPER, Shirpur
Date of activity	13 th March 2024
Event Coordinator	Mr. N. P. Pawar
Speaker Name	-
Objectives	Discuss & verbalize the role of a basic healthcare provider Demonstrate techniques to maintain the personal hygiene needs of a patient, Practice infection control measures, Demonstrate the ability to perform clinical skills essential in providing basic healthcare services, Promote safety, understand usage of protective devices and demonstrate precautions to be taken while usage of Oxygen, Demonstrate Basic Life Support, Cardio Pulmonary Resuscitation and other actions in the event of medical and facility emergencies
Number of Participant	61
Brief Report on activity	The girl students visited the Primary Health Care Hospital located on the third floor of HRPIPER, Shirpur, where they underwent the General Duty Assistant Advanced Course conducted by the Government of India to facilitate employment opportunities. During the course, the students demonstrated their ability to perform essential clinical skills necessary for providing basic healthcare services. They also learned about promoting safety, understanding the usage of protective devices, and demonstrated precautions to be taken when using Oxygen, performing Basic Life Support, Cardio Pulmonary Resuscitation, and other necessary actions in the event of medical and facility emergencies.
	 <p>GPS Map Camera</p> <p>Shirpur, Maharashtra, India Kavind Naka, Mandal, Shirpur, Maharashtra 425405, India Lat 21.356639° Long 74.89203° 13/03/24 03:18 PM GMT +05:30</p> <p>Google</p>



**Photograph
Of activity**



Outcome

They gained a comprehensive understanding of safety promotion, proper utilization of protective equipment, and demonstrated adeptness in observing precautions while handling Oxygen, administering Basic Life Support, conducting Cardio Pulmonary Resuscitation, and managing various medical and facility emergencies.

R. Pawar
Mr. N. P. Pawar
Student Development Officer



S. B. Bari
Dr. S. B. Bari
Principal
H.R. Patel Institute of Pharmaceutical
Education & Research,
Shirpur Dist Dhule (M.S.) 425 405

Name of Activity	Guest lecture on Young Women and Social Media
Organizer	Student Development Department of KBCNMU, Jalgaon, and HRPIPER, Shirpur Organized jointly
Venue	HRPIPER Seminar hall, Shirpur
Date of activity	16 th March 2024
Event Coordinator	Mr. N. P. Pawar
Speaker Name	Dr. Vivekanand L. Chavan
Objectives	Stress the importance of developing digital literacy skills and critical thinking abilities to navigate social media effectively. Encourage the audience to question content authenticity and recognize manipulation tactics.
Number of Participant	88
Brief Report on activity	A guest lecture was held on the topic of Young Women and Social Media. A guest lecturer for this Dr. Vivekanand L. Chavan sir was welcomed by the principal of the college Dr. S. B. Bari presented the bouquet. The direction of the lecture was steered by the students of Khopragade College, while gratitude was expressed by Prof. N. P. Pawar. The lecture was attended by first and second year B. Pharm girl students of the college. Dr. Vivekanand L. Chavan Showcased instances where social media serves as a tool for young women's empowerment, activism, and community-building. Highlighted successful campaigns and movements led by young women online.
Photograph Of activity	