

NIRMA UNIVERSITY

Institute:	Institute of Pharmacy
Name of Programme:	Pharm. D
Course Code:	PD202
Course Title:	PHARMACEUTICAL MICROBIOLOGY
Course Type:	<input checked="" type="checkbox"/> Core/ <input type="checkbox"/> Value Added Course / <input type="checkbox"/> Departmental Elective/ <input type="checkbox"/> Institute Elective/ <input type="checkbox"/> University Elective/(<input type="checkbox"/> Open Elective Any other)
Year of introduction:	2023-2024

L	T	Practical component				C
		LPW	PW	W	S	
3	1	3	-	-	-	12

Course Learning Outcomes (CLO):

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

1. Understand fundamentals of pharmaceutical microbiology and types of micro-organism. (BL2)
2. Identify type of bacteria (by various staining techniques), counting, growth and cultivation of microorganisms. (BL1)
3. Describe principle, operations and applications of various sterilization techniques, type of disinfectants and its evaluation. (BL2)
4. Explain immunology, antigen-antibody interactions and various diagnostic tests. (BL2)
5. Discuss microbial culture sensitivity test and microbiological assays of antibiotics. (BL2)
6. Practice aseptic processing for cultivation and isolation of microorganism (BL3)

Syllabus:

Total Teaching hours: 90 hours

Unit	Syllabus	Teaching hours
Unit-I	a) Introduction to the science of microbiology. Major divisions of microbial world and Relationship among them. b) Different methods of classification of microbes and study of Bacteria, Fungi, virus, Rickettsiae, Spirochetes.	10 Hours
Unit-II	a) Nutritional requirements , growth and cultivation of bacteria and virus. Study of different important media required for the growth of aerobic and anaerobic bacteria & fungi. Differential media, enriched media and selective media, maintenance of lab cultures. b) Different methods used in isolation and identification of bacteria with emphasis to different	20 Hours

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	staining techniques and biochemical reactions. Counting of bacteria -Total and Viable counting techniques.	
Unit-III	a) Detailed study of different methods of sterilization including their merits and demerits. Sterilization methods for all pharmaceutical products. b) Detailed study of sterility testing of different pharmaceutical preparations. Brief information on Validation. c) Disinfectants - Study of disinfectants, antiseptics, fungicidal and virucidal agents, factors affecting their activation and mechanism of action. Evaluation of bactericidal, bacteriostatic, virucidal activities, evaluation of preservatives in pharmaceutical preparations.	20 Hours
Unit - IV	a) Immunology - Immunity, Definition, Classification, General principles of natural immunity, Phagocytosis, acquired immunity (active and passive). Antigens, chemical nature of antigens structure and formation of Antibodies, Antigen-Antibody reactions. Bacterial exotoxins and endotoxins. Significance of toxoids in active immunity, Immunization programme, and importance of booster dose. b) Diagnostic tests : Schick's Test, Elisa test, Western Blot test, Southern Blot PCR Widal, QBC, Mantoux Peripheral smear. Study of malarial parasite.	20 Hours
Unit - V	a) Microbial culture sensitivity Testing : Interpretation of results, Principles and methods of different microbiological assays, microbiological assay of Penicillin, Streptomycin and vitamin B ₂ and B ₁₂ . Standardisation of vaccines and sera. b) Study of infectious diseases : Typhoid, Tuberculosis, Malaria, Cholera, Hepatitis, Meningitis, Syphilis & Gonorrhea and HIV.	20 Hours

Tutorials

Tutorials will be based on above syllabus

Teaching Hours:

30 Hours

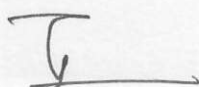
Suggested Readings/References:

Text books: (Latest edition)

1. Vanitha Kale and Kishor Bhusari — Applied Microbiology I Himalaya Publishing house Mumbai.
2. Mary Louis Turgeon — Immunology and Serology in Laboratory Medicines, Mosby- Year book inc St. Louis Missouri 63146.
3. Harsh Mohan, — Text book of Pathology, B-3 Ansari road Daryaganj N. Delhi.

Reference books: (Latest edition)

1. Prescott L.M., Jarley G.P Klein D.A —Microbiology, Mc Graw Hill Company Inc
2. Rawlins E.A., Bentley's Text Book of Pharmaceutics, B ailliere Tindals 24-28 London



3. Forbisher — Fundamentals of Microbiology Philadelphia W.B. Saunders.
4. Prescott L.M. Jarley G.P., Klein.D.A. — Microbiology. WMC Brown Publishers, Oxford.
5. War Roitt, Jonathan Brostoff, David male, — Immunology, Mosbyyear book Europe Ltd, London.
6. Pharmacopocia of India, Govt of India.

Suggested
List of
Experiments:
(90 Hours)

1. Study of apparatus used in experimental microbiology*.
2. Sterilisation of glass ware's. Preparation of media and sterilization.*
3. Staining techniques – Simple staining ; Gram's staining ; Negative staining**
4. Study of motility characters*.
5. Enumeration of micro-organisms (Total and Viable)*
6. Study of the methods of isolation of pure culture.*
7. Bio chemical testing for the identification of micro*-organisms.
8. Cultural sensitivity testing for some micro-organisms.*
9. Sterility testing for powders and liquids.*
10. Determination of minimum inhibitory concentration.*
11. Microbiological assay of antibiotics by cup plate method.*
12. Microbiological assay of vitamins by Turbidometric method**
13. Determination of RWC.**
14. Diagnostic tests for some common diseases, Widal, malarial parasite.**

* Indicate minor experiment & ** indicate major experiment

Assignments:

- 1 Visit to some pathological laboratories & study the activities and equipment/instruments used and reporting the same.
2. Visit to milk dairies (Pasturization) and microbial laboratories(other sterization methods) & study the activities and equipment/instruments used and reporting the same.
3. Library assignments
 - a. Report of recent microbial techniques developed in diagnosing some common diseases.
 - b. Latest advancement developed in identifying, cultivating & handling of microorganisms.

Scheme of Practical Examination:

	Sessionals	Annual
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance)

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NIRMA UNIVERSITY

Institute:	PHARMACY
Name of Programme:	PHARM D
Course Code:	PD203
Course Title:	PHARMACOGNOSY & PHYTOPHARMACEUTICALS
Course Type:	<input checked="" type="checkbox"/> Core/ <input type="checkbox"/> Value Added Course/ <input type="checkbox"/> Departmental Elective/ <input type="checkbox"/> Institute Elective/ <input type="checkbox"/> University Elective/ (<input type="checkbox"/> Open Elective Any other)
Year of Introduction:	2023 – 2024

L	T	Practical component				C
		LPW	PW	W	S	
3	1	3	--	--	-	12

Scope:

This subject has been introduced for the pharmacy course in order to make the student aware of medicinal uses of various naturally occurring drugs its history, sources, distribution, method of cultivation, active constituents, medicinal uses, identification tests, preservation methods, substitutes and adulterants.

Objectives:

Upon completion of the course the student shall be able to-

1. Understand the basic principles of cultivation, collection and storage of crude drugs;
2. Know the source, active constituents and uses of crude drugs; and
3. Appreciate the applications of primary and secondary metabolites of the plant.

Course Learning Outcomes (CLO):

Upon completion of the course the student shall be able to-

1. Understand basics of pharmacognosy and classification of crude drugs (BL 2)
2. Explain cell constituents, secondary metabolites and pharmacognostic study of crude drugs (BL 2)
3. Describe various aspects of cultivation, collection, storage and adulteration. (BL 2)
4. Categorize various Carbohydrates and protein containing drugs and its importance (BL 4)
5. Discuss natural lipids, oil, fibers and pesticide containing crude drug (BL 2)
6. Evaluate the practical aspects of various crude drugs belonging to category of various primary and secondary metabolite. (BL 5)

Syllabus:

Teaching hours: 90 Hours

Unit	Syllabus	Teaching hours
Unit-I	Introduction to Pharmacognosy: Definition, history, scope and development of Pharmacognosy (a) Sources of Drugs – Plants, Animals, Marine & Tissue culture (c) Organized drugs, unorganized drugs (dried latex, dried juices, dried extracts, gums and mucilages, oleoresins and oleo- gum -resins). Classification of drugs: Alphabetical, morphological, taxonomical, chemical, pharmacological, chemo and sero -taxonomical classification of drugs	10 hours
Unit-II	Study of cell wall constituents and cell inclusions	

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Detailed study of various cell constituents**Introduction to secondary metabolites:**

Definition, classification, properties and test for identification of Alkaloids, Glycosides, Flavonoids, Tannins, Volatile oil and Resins

Morphological and microscopical study of crude drugs mentioned in Practical:

Glycosides: Senna, Liquorice, Quassia

Alkaloids: Datura, Cinchona, Ephedra, Rauwolfia, Nux vomica

Resins: Ginger, Podophyllotoxin

Volatile oil: cinnamon, clove, fennel, coriander

Unit-III	Cultivation, collection, processing and storage of crude drugs. Factors influencing cultivation of medicinal plants. Plant hormones and their applications. Polyploidy, mutation and hybridization with reference to medicinal plants Detailed method of cultivation of crude drugs. Different methods of adulteration of crude drugs.	15 hours
Unit-IV	Carbohydrates and related products. Detailed study carbohydrates containing drugs: Acacia, Agar, Tragacanth, Honey, Starch, Isabgol Definition, classification, chemistry and method of analysis of protein. Proteins and Enzymes: Gelatin, casein, proteolytic enzymes (Papain, bromelain, serratiopeptidase, urokinase, streptokinase, pepsin).	15 hours
Unit-V	Definition, sources, method extraction, chemistry and method of analysis of lipids. Detailed study of Lipids (Waxes, fats, fixed oils): castor oil, sesame oil, shark liver oil, bees wax	15 hours
Unit-VI	Study of Natural Pesticides: Types, classification, mechanism of action Study of Plants Fibres used in surgical dressings and related products : Cotton, silk, wool and regenerated fibres	10 hours

Tutorials

Tutorials will be based on above syllabus.

Teaching hours:
30 Hours

Suggested Readings/References:	Text books (latest edition) 1. Trease, G. E., & Evans, W. C., Pharmacognosy. 2. Kokate, C. K., Purohit, A. P., & Gokhale, D. S., Pharmacognosy. Nirali prakashan. Reference books (latest edition) 1. Tyler, V. E., Brady, L. R., & Robbers, J. E., <i>Pharmacognosy</i> . Lee & Febiger. 2. Wallis, T. E., Textbook of pharmacognosy. 3. Shah, C. S., & Qadri, J. S., In Text book of pharmacognosy (Shah, BS), prakashan. 4. Iyengar, M. A., Pharmacognosy of powdered crude drugs.
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Suggested List of Experiments: General Requirements: Laboratory Napkin, Observation Book 150 pages Zero brush, Needle, Blade, Match box.

- 1 Introduction of Pharmacognosy laboratory and experiments.
- 2 Study of cell wall constituents and cell inclusions.
- 3 Macro, powder and microscopic study of Datura.
- 4 Macro, powder and microscopic study of Senna.
- 5 Macro, powder and microscopic study of Cassia cinnamon.
- 6 Macro, powder and microscopic study of Cinchona.
- 7 Macro, powder and microscopic study of Ephedra.
- 8 Macro, powder and microscopic study of Quassia.
- 9 Macro, powder and microscopic study of Clove
- 10 Macro, powder and microscopic study of Fennel.
- 11 Macro, powder and microscopic study of Coriander.
- 12 Macro, powder and microscopic study of Isapgol.
- 13 Macro, powder and microscopic study of Nux vomica.
- 14 Macro, powder and microscopic study of Rauwolfia.
- 15 Macro, powder and microscopic study of Liquorice.
- 16 Macro, powder and microscopic study of Ginger.
- 17 Macro, powder and microscopic study of Podophyllum.
- 18 Determination of Iodine value.
- 19 Determination of Saponification value and unsaponifiable matter.
- 20 Determination of ester value.
- 21 Determination of Acid value.
- 22 Chemical tests for Acacia.
- 23 Chemical tests for Tragacanth.
- 24 Chemical tests for Agar.
- 25 Chemical tests for Starch.
- 26 Chemical tests for Lipids. (castor oil, sesame oil, shark liver oil, bees wax)
- 27 Chemical tests for Gelatin.

L= Lecture, T= Tutorial, P= Practical, C= Credit

^ this is not an exhaustive list

Scheme of Practical Examination:

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	Sessionals	Annual
Identification	04	10
Synopsis	04	10
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Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance.

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NIRMA UNIVERSITY

Institute:	Institute of Pharmacy
Name of Programme:	Pharm. D
Course Code:	PD201
Course Title:	PATHOPHYSIOLOGY
Course Type:	(<input checked="" type="checkbox"/> Core/ <input type="checkbox"/> Value Added Course / <input type="checkbox"/> Departmental Elective/ <input type="checkbox"/> Institute Elective/ <input type="checkbox"/> University Elective/(<input type="checkbox"/> Open Elective Any other)
Year of introduction:	2023-2024

L	T	Practical component				C
		LPW	PW	W	S	
3	1	-	-	-	-	8

Course Learning Outcomes (CLO):

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

1. Name the causes, pathogenesis and morphology of cell injury and inflammation with disease. (BL1)
2. Relate the signs and symptoms and pathogenesis of the immunological diseases. (BL2)
3. Identify differences between pathophysiology of different types of tumors. (BL3)
4. Demonstrate etiology, pathophysiology of infectious disease. (BL2)
5. Compare pathophysiology of common diseases. (BL2)
6. Analyze effect of environment, radiation shock and nutrition on pathogenesis of various diseases. (BL4)

Syllabus:

Total Teaching hours: 90 hours

Unit	Syllabus	Teaching hours
Unit-I	Basic principles of cell injury and Adaptation a) Causes, Pathogenesis and morphology of cell injury b) Abnormalities in lipoproteinaemia, glycogen infiltration and glycogen infiltration and glycogen infiltration and glycogen storage diseases Inflammation a) Pathogenesis of acute inflammation, Chemical mediators in inflammation, Types of chronic inflammation b) Repairs of wounds in the skin, factors influencing healing of wounds	15 hours
Unit-II	Diseases of Immunity a) Introduction to T and B cells, b) MHC proteins or transplantation antigens, c) Immune tolerance Hypersensitivity: Hypersensitivity type I, II, III, IV, Biological significance, Allergy due to food, chemicals and drugs	10 hours

7

Autoimmunity: Criteria for autoimmunity, Classifications of autoimmune diseases in man, mechanism of autoimmunity, Transplantation and immunologic tolerance, allograft rejections, transplantation antigens, mechanism of rejection of allograft. Acquired immune deficiency syndrome (AIDS), Amyloidosis

- Unit-III Cancer** **10 hours**
Differences between benign and malignant tumors, Histological diagnosis of malignancy, invasions and metastasis, patterns of spread, disturbances of growth of cells, classification of tumors, general biology of tumors, spread of malignant tumors, etiology and pathogenesis of cancer.
- Unit-IV Infectious diseases** **10 hours**
Sexually transmitted diseases (Acquired immune deficiency syndrome (AIDS), HIV, Syphilis, Gonorrhea), Urinary tract infections, Pneumonia, Typhoid, Tuberculosis, Leprosy, Malaria Dysentery (bacterial and amoebic), Hepatitis- infective hepatitis
- Unit-V Pathophysiology of common diseases** **20 hours**
a) Parkinsonism
b) Schizophrenia
c) Depression and mania
d) Hypertension
e) Stroke (ischemic and hemorrhage)
f) Angina, CCF, Atherosclerosis, Myocardial infarction
- Unit-VI Pathophysiology of common diseases** **20 hours**
a) Diabetes Mellitus
b) Peptic ulcer and inflammatory bowel diseases
c) Cirrhosis and Alcoholic liver diseases
d) Acute and chronic renal failure
e) Asthma and chronic obstructive airway diseases
- Unit-VII Types of shock, mechanisms, stages and management** **5 hours**
Biological effects of radiation
Environmental and nutritional diseases
a) Air pollution and smoking- SO₂, NO, NO₂, and CO
b) Protein calorie malnutrition, vitamins, obesity, pathogenesis of starvation.

Suggested Readings/References:

Text books (Latest edition)

1. Pathologic basis of disease by- Cotran, Kumar, Robbins
2. Text book of Pathology- Harsh Mohan
3. Text book of Pathology- Y.M. Bhide

Reference books (Latest edition)

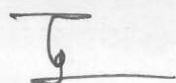
1. Clinical Pharmacy and Therapeutics; Second edition; Roger Walker; Churchill Livingstone publication.

Tutorials

Tutorials will be based on above syllabus

Teaching hours: 30 hours

8



Assignments: Title of the Assignments

- 1 Chemical Mediators of inflammation
- 2 Drug Hypersensitivity
- 3 Cigarette smoking & its ill effects
- 4 Biological Effects of Radiation
- 5 Etiology and hazards of obesity
- 6 Complications of diabetes
- 7 Diagnosis of cancer
- 8 Disorders of vitamins
- 9 Methods in Pathology-Laboratory values of clinical significance
- 10 Pathophysiology of Dengue Hemorrhagic Fever (DHF)

NIRMA UNIVERSITY

Institute:	Institute of Pharmacy
Name of Programme:	Pharm. D
Course Code:	PD204
Course Title:	PHARMACOLOGY-I
Course Type:	<input checked="" type="checkbox"/> Core/ <input type="checkbox"/> Value Added Course / <input type="checkbox"/> Departmental Elective/ <input type="checkbox"/> Institute Elective/ <input type="checkbox"/> University Elective/(<input type="checkbox"/> Open Elective Any other)
Year of introduction:	2023-2024

L	T	Practical component				C
		LPW	PW	W	S	
3	1	-	-	-	-	8

Course Learning Outcomes (CLO):

Upon completion of the course the student shall be able to

1. Define pharmacokinetic and pharmacodynamics aspects of drugs. (BL1)
2. Classify and explain pharmacology of drugs acting on ANS. (BL2)
3. Outline pharmacology of drugs acting on cardiovascular system. (BL2)
4. Relate and apply the knowledge of drugs acting on Central Nervous System for treatment of CNS disorders. (BL2)
5. Compare and contrast hormones and hormone antagonists. (BL2)
6. Explain drugs acting on respiratory tract infections. (BL2)

Syllabus:

Total Teaching hours: 90 hours

Unit	Syllabus	Teaching hours
Unit-I	General Pharmacology	20 hours
	a) Introduction, definitions and scope of pharmacology b) Routes of administration of drugs c) Pharmacokinetics (absorption, distribution, metabolism and excretion) d) Pharmacodynamics e) Factors modifying drug effects f) Drug toxicity - Acute, sub- acute and chronic toxicity. g) Pre-clinical evaluations h) Drug interactions	
Unit-II	Pharmacology of drugs acting on ANS	15 hours
	a) Adrenergic and antiadrenergic drugs b) Cholinergic and anticholinergic drugs c) Neuromuscular blockers d) Mydriatics and miotics e) Drugs used in myasthenia gravis f) Drugs used in Parkinsonism	

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Unit-III	Pharmacology of drugs acting on cardiovascular system a) Antihypertensives b) Anti-anginal drugs c) Anti-arrhythmic drugs d) Drugs used for therapy of Congestive Heart Failure e) Drugs used for hyperlipidaemias	15 hours
Unit-IV	Pharmacology of drugs acting on Central Nervous System a) General anesthetics b) Sedatives and hypnotics c) Anticonvulsants d) Analgesic and anti-inflammatory agents e) Psychotropic drugs f) Alcohol and methyl alcohol g) CNS stimulants and cognition enhancers h) Pharmacology of local anaesthetics	20 hours
Unit-V	Pharmacology of Hormones and Hormone antagonists a) Thyroid and Antithyroid drugs b) Insulin, Insulin analogues and oral hypoglycemic agents c) Sex hormones and oral contraceptives d) Oxytocin and other stimulants and relaxants	10 hours
Unit-VI	Pharmacology of Drugs acting on Respiratory tract a) Bronchodilators b) Mucolytics c) Expectorants d) Antitussives e) Nasal Decongestants Pharmacology of autocooids and their antagonists a) Histamines and Anti-histaminics b) 5-Hydroxytryptamine and its antagonists c) Lipid derived autocooids and platelet activating factor	10 hours

Note: The term Pharmacology used here refers to the classification, mechanism of action, pharmacokinetics, pharmacodynamics, adverse effects, contraindications, Therapeutic uses, interactions and dose and route of administration.

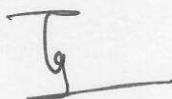
Suggested Readings/References:	Text books (Latest edition) a) Tripathi, K. D. Essentials of medical pharmacology. Publisher: Jaypee, Delhi. b) Satoskar, R.S. and Bhadarkar, S.D. Pharmacology and pharmacotherapeutics. Publisher: Popular, Dubai. c) Rang, H.P. & Dale, M.M. Pharmacology. Publisher: Churchill Living stone. Reference books (Latest edition) a) Goodman Gilman, A., Rall, T.W., Nies, A.I.S. and Taylor, P. Goodman and Gilman's The pharmacological Basis of therapeutics. Publisher Mc Graw Hill, Pergamon press. b) Craig, C.R.&Stitzel, R.E. Modern Pharmacology. Publisher: Little Brown.Co
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- c) Katzung, B.G. Basic and clinical pharmacology. Latest edition. Publisher: Prentice Hall, Int.
- d) Shargel and Leon. Applied Biopharmaceutics and pharmacokinetics. Latest edition. Publisher: Prentice Hall, London.

Tutorials

Tutorials will be based on above syllabus

Teaching hours: 30 hours



NIRMA UNIVERSITY

Institute:	Institute of Pharmacy
Name of Programme:	Pharm. D.
Course Code:	PD205
Course Title:	Community Pharmacy
Course Type:	(<input checked="" type="checkbox"/> Core/ <input type="checkbox"/> Value Added Course/ <input type="checkbox"/> Departmental Elective/ <input type="checkbox"/> Institute Elective/ <input type="checkbox"/> University Elective/ <input type="checkbox"/> Open Elective Any other)
Year of introduction:	2023-2024

L	T	Practical component				C
		LPW	PW	W	S	
2	1	-	-	-	-	6

Course Learning Outcomes (CLO):

Upon completion of the course the student shall be able to

1. List and define Community Pharmacy services and its management. (BL1)
2. Illustrate the business and professional practice management skills in community pharmacies. (BL2)
3. Outline patient counselling, medication adherence and health screening services to public in community Pharmacy. (BL2)
4. Identify causes, clinical presentations and prevention of communicable diseases (BL2)
5. Plan appropriate medication to special population. (BL3)
6. Build the concept of rational drug therapy and appropriate medication for minor ailments. (BL3)

Syllabus:

Total Teaching hours: 60 hours

Unit	Syllabus	Teaching hours
Unit-I	Definition, scope, of community pharmacy, Roles and responsibilities of Community pharmacist	15 hours
	Community Pharmacy Management	
	a) Selection of site, Space layout, and design	
	b) Staff, Materials: coding, stocking	
	c) Legal requirements	
	d) Maintenance of various registers	
	e) Use of Computers: Business and health care softwares.	
Unit-II	Prescriptions	10 hours
	Parts of prescription, legality and identification of medication related problems like drug interactions.	
	Inventory control in community pharmacy	
	Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time, safety stock	

Unit-III Pharmaceutical care 15 hours
 Definition and Principles of Pharmaceutical care
Patient counselling
 Definition, outcomes, various stages, barriers, Strategies to overcome barriers. Patient information leaflets- content, design, layouts, advisory labels
Patient medication adherence
 Definition, factors affecting medication adherence, role of pharmacist in improving the adherence.
Health screening services
 Definition, importance, methods for screening blood pressure/ blood sugar/ lung function and Cholesterol testing

Unit-IV OTC Medication 10 hours
 Definition, OTC medication list & Counselling
Health Education
 WHO Definition of health, and health promotion, care for children, pregnant & breastfeeding women, and geriatric patients. Commonly occurring Communicable Diseases, causative agents, Clinical presentations and prevention of communicable diseases – Tuberculosis, Hepatitis, Typhoid, Amoebiasis, Malaria, Leprosy, Syphilis, Gonorrhea and AIDS
 Balance diet, and treatment & prevention of deficiency disorders. Family planning – role of pharmacist

Unit-V Responding to symptoms of minor ailments 10 hours
 Relevant pathophysiology, common drug therapy to pain, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhea, constipation), Pyrexia, Ophthalmic symptoms, worms infestations.
Essential Drugs concept and Rational Drug Therapy
Role of community pharmacist
Code of ethics for community pharmacists

Suggested Readings/References: **Text Books (Latest edition)**
 a. Health Education and Community Pharmacy by N.S.Parmar.
 b. WHO consultative group report.
 c. Drug store & Business management by Mohammed Ali & Jyoti.

Reference books (Latest edition)
 a. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.
 b. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams & Wilkins.

Tutorials Teaching hours: 30 hours
 Tutorials will be based on above syllabus

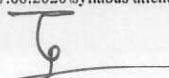
Special Requirements

1. Either the college is having model community pharmacy (meeting the schedule N requirement) or sign MoU with at least 4-5 community pharmacies nearby to the college for training the students on dispensing and counselling activities.
2. Special equipment's like B.P apparatus, Glucometer, Peak flow meter, and apparatus for cholesterol estimation.

Scheme of Evaluation of theory

(80 Marks)

1	Synopsis	10
2	Major Experiment (Counselling of patients with specific diseases – emphasis should be given on Counselling introduction, content, process and conclusion)	30
3	Minor Experiment (Ability to measure B.P/ CBG / Lung function)	15
4	Prescription Analysis (Analyzing the prescriptions for probable drug interaction and ability to tell the management)	15
5	Viva – Voce	10



NIRMA UNIVERSITY

Institute:	Institute of Pharmacy
Name of Programme:	Pharm.D
Course Code:	PD206
Course Title:	Pharmacotherapeutics-I
Course Type:	<input checked="" type="checkbox"/> Core/ <input type="checkbox"/> Value Added Course/ <input type="checkbox"/> Departmental Elective/ <input type="checkbox"/> Institute Elective/ <input type="checkbox"/> University Elective/(<input type="checkbox"/> Open Elective Any other)
Year of introduction:	2023-2024

L	T	Practical component				C
		LPW	PW	W	S	
3	1	3	-	-	-	12

Course Learning Outcomes (CLO):

Upon completion of the course the student shall be able to

1. Demonstrate the pathophysiology of cardiovascular disease and the rationale for drug therapy. (BL2)
2. Summarize therapeutic management of respiratory and endocrine disorders. (BL2)
3. Develop the patient-specific guidelines relevant in initiating drug therapy and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects). (BL2)
4. Explain the therapeutic approach to management of ophthalmology disease (BL2)
5. Build the concept of essential drug therapy. (BL3)
6. Apply the knowledge therapeutically by attending various departments. (BL1)

Syllabus:

Total Teaching hours: 90 hours

Unit	Syllabus	Teaching hours
Unit-I	Cardiovascular System Hypertension, Congestive cardiac failure, Angina pectoris, Myocardial infarction, Hyperlipidaemias, Electrophysiology of heart and arrhythmias	20 hours
Unit-II	Respiratory System Introduction to Pulmonary function test, Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases Endocrine System Diabetes, Thyroid diseases, Oral contraceptives, Hormone replacement therapy, Osteoporosis	20 hours
Unit III	General prescribing guidelines for a) Pediatric patients b) Geriatric patients	20 hours

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c) Pregnancy and breast feeding

Unit-IV Ophthalmology

15 hours

Glaucoma, Conjunctivitis- viral and bacterial.

Unit V Introduction to rational drug use

15 hours

Definition, Role of pharmacist Essential drug concept
Rational drug formulations

NOTE: Etiopathogenesis and pharmacotherapy of diseases associated with the above-mentioned systems

Suggested
Readings/
References:

Text Books (Latest edition)

- a) Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication.
- b) Pharmacotherapy - A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange.

Reference Books (Latest edition)

- a) Pathologic basis of disease - Robins SL, W.B. Saunders publication.
- b) Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication.
- c) Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication.
- d) Applied Therapeutics - The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA
- e) Avery's Drug Treatment, Adis International Limited.
- f) Relevant review articles from recent medical and pharmaceutical literature.

Tutorials

Tutorials will be based on above syllabus

Teaching hours: 30 hours

Practicals

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge.

Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation. A minimum of 20 cases should be presented and recorded covering most common diseases.

Assignments

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

Scheme of Practical Examination

	Sessional	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note: Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance)

