COURSE MODULE

Program Title	B. Pharmacy
Department	Pharmacology
Course Title	PHARMACOLOGY-III

1. **NAME OF INSTITUTION** : Y. B. CHAVAN COLLEGE OF PHARMACY,

AURANGABAD

2. **AFFILIATED UNIVERSITY** : DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

3. **DEPARTMENT** : Pharmacology

4. **PROGRAM TITLE** : B. PHARM.

4.1. Program Outcomes (PO):

PO 01:Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.

PO 02:Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

PO 03:Problem analysis: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.

PO 04:Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

PO 05:Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.

PO 06: Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

PO 07: Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

PO 08:Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

PO 09:The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

PO 10:Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 11:Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

5. COURSE SPECIFICATION :

5.1.Course Identification and General Information

a. Course Title:	**Pharmacology-III**	
b. Course Number/Code	**BP602T and BP 608P**	
c. Credit Hours	Theory	Practical
	45 (3 hrs/Week)	**60 (4h/wk)**
d. Study level/semester at which this course is offered	**Sixth Semester B. Pharm**	
e. Pre-requisite	Core concepts of Pharmacology-I, II and Pathophysiology	
f. Co-requisite	N/A	
g. Program in which the course is offered	B Pharm	
h. Language of teaching the course	English	
i. Prepared by	Dr. Nikhil S Sakle and Dr. Khan Dureshahwar	
j. Approved by HOD	Dr. Syed Ayaz Ali	

5.2.Course Description:

Pharmacology is the scientific study of drugs and their action on biological systems, ranging from genes and cells up to tissues and even human populations. A drug is any substance given to a human or animal with the intention of changing the state of body function: to relieve pain, treat cancer, eliminate infection or improve health. Pharmacology is also concerned with the use of drugs as investigative tools to obtain a better understanding of cellular and physiological processes in both health and disease. In the Pharmacology course, students will have the opportunity to take part in drug development research.

5.3.Course Objectives:

At the end of this course you will be able to understand

•Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases

•Comprehend the principles of toxicology and treatment of various poisonings and Appreciate correlation of pharmacology with related medical sciences.

6.0.Course Outcomes (COs) : (Min. 4 and Max. 6)

(Use Bloom's Taxonomy words)

CO Code	Course outcome
CO 602T.01	**Choose and classify the range of medicines used for the effective treatment of Respiratory system and Gastrointestinal Tract.**
CO 602T 02	**Relate and translate the applications, mechanism of action, adverse drug reactions, drug interactions, contraindications of chemotherapeutic.**
CO 602T 03	**Make use of the basic skill required to use of chemotherapeutic and Immunological agents.**
CO 602T 04	**Relate the scientific concepts of Toxicology and its management.**
CO 602T 05	**Summarize the basic scientific concepts and general principles of chronopharmacology.**

6.1. Knowledge and Understanding

(Alignment of POs to COs)

CO Code	Program Outcome (PO)										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 602T.01	**H**	**-**	**-**	**-**	**-**	**H**	**-**	**-**	**H**	**-**	**H**
CO 602T 02	**H**	**M**	**-**	**H**	**-**	**H**	**M**	**-**	**H**	**H**	**H**
CO 602T 03	**H**	**-**	**S**	**-**	**-**	**H**	**-**	**-**	**H**	**-**	**H**
CO 602T 04	**H**	**-**	**S**	**-**	**-**	**H**	**-**	**-**	**H**	**-**	**H**
CO 602T 05	**H**	**-**	**S**	**-**	**-**	**H**	**-**	**-**	**H**	**-**	**H**

Correlation levels 1, 2 or 3 as defined below:

1: Slight (Low); 2: Moderate (Medium); 3: Substantial (High); If there is no correlation, put '-'

6.2.Teaching and Assessment Methods for achieving learning outcome:

Teaching Strategies(methods)/Tools used	Methods of Assessment

Lectures (Constructivist learning) **Collaborative learning (Discussion)** **Project based Learning** **Blended learning** **Inquiry based learning** **Flash cards** **Video** **Equipment models**	**Formative Assessment** **Case study** **Class test** **Multiple choice questions** **Assignments** **Seminar** **Viva Voce** **Synopsis** **Tutorials** **Summative Assessment**

6.3.Tools for the Teaching and learning

Theory subjects	Practical Subjects
• **PowerPoints presentation** • **Videos** • **Flash Card** • **Models** • **Software** • **Charts** • **Smart Boards** • **White boards** • **Online Platform**	• **White boards** • **Glassware** • **Chemicals** • **Instruments** • **Equipment** • **Software** • **Models** • **Plants/Crude Drugs** • **Animal**

6.4.COURSE CONTENT

6.1. Theoretical Aspect:

Order	Topic list/units	Subtopics list	Number of Weeks	Contact Hours
1	**Unit I**	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	3 and Half week	10
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.	3 and Half week	10
3	**Unit II**	Chemotherapy a. General principles of chemotherapy. b. Sulfonamides and cotrimoxazole. c. Antibiotics- Penicillins, cephalosporins, chloramphenicol, macrolides, quinolones and fluoroquinolins, tetracycline and aminoglycosides	3 and Half week	10
4	**Unit III**	Chemotherapy a. Antitubercular agents b. Antileprotic agents c. Antifungal agents d. Antiviral drugs e. Anthelmintics f. Antimalarial drugs g. Antiamoebic agents	2 and half week	8
5	**Unit IV**	Chemotherapy a. Urinary tract infections and sexually transmitted diseases. b. Chemotherapy of malignancy	2 and half week	7
6		Immunopharmacology a. Immunostimulants b. Immunosuppressant Protein drugs, monoclonal antibodies, target drugs to antigen, biosimilars		
7	**Unit V**	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, organophosphosphorus compound and lead, mercury and arsenic poisoning.	2 and half week	7
8		Chronopharmacology a. Definition of rhythm and cycles. b. Biological clock and their significance leading to chronotherapy		

	TOTAL			45

6.2.Practical Aspects:-

Order	Tasks/Experiments	Number of Weeks	Contact Hours
1	Dose calculation in pharmacological experiments	01	4h/wk
2	Antiallergic activity by mast cell stabilization assay	01	4h/wk
3	Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model	01	4h/wk
4	Study of effect of drugs on gastrointestinal motility	01	4h/wk
5	Effect of agonist and antagonists on guinea pig ileum	01	4h/wk
6	Estimation of serum biochemical parameters by using semi-autoanalyser	01	4h/wk
7	Effect of saline purgative on frog intestine	01	4h/wk
8	Insulin hypoglycemic effect in rabbit	01	4h/wk
9	Test for pyrogens (Rabbit method)	01	4h/wk
10	Determination of acute oral toxicity (LD50) of a drug from a given data	01	4h/wk
11	Determination of acute skin irritation / corrosion of a test substance	01	4h/wk
12	Determination of acute eye irritation / corrosion of a test substance	01	4h/wk
13	Calculation of pharmacokinetic parameters from a given data	01	4h/wk
14	Biostatistics methods in experimental pharmacology (Student's t test, ANOVA)	01	4h/wk
15	Biostatistics methods in experimental pharmacology (Chi square test, Wilcoxon Signed Rank test)	01	4h/wk

7.0. ASSESSMENT MECHANISM:

Sr. No.	Assessment Mechanism	Week due	Marks	Proportion of Final Assessment
1	Assignments, Exercises & Home works	2nd week of every month	10	6%
2	Sessional (Internal Theory exam)	As per scheduled examination	15	10%
3	Continuous Practical Assessment (Sessional Practical exam)	Weekly during practical	15	10%
4	Final exam (theory)		75	50%

5	Final exam (practical)	As per University at end of course	35	24%
Total			150	**100%**

8.0.STUDENT SUPPORT:

Office hours/week	Other procedures
Two hours minimum	**dureshahwar_31@yahoo.com** **nikhilsakle@gmail.com**

9.0.TEACHER'S AVAILABILITY FOR STUDENT SUPPORT:

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Time	**04:00-5:00**	**04:00-5:00**	**04:00-5:00**	**04:00-5:00**	**04:00-5:00**	**10:00-12:00**

10.0. LEARNING RESOURCES:

Sr.No.	Title of Learning Material	Details
1	Text books	Barar F.S.K., Essentials Of Pharmacotherapeutics, S.Chand & Co.Pvt.Ltd.,
2	Essential references (as per syllabus)	Rang. M.P., Dale M.M., Riter J. M. /4thed, Pharmacology, Churchill, Livingstone
3	Reference material	Text books in college library
4	E-materials and websites	You tube videos
5	Other learning material	Handwritten notes

11.0. FACILITIES REQUIRED:

Sr.No.	Particular of Facility Required
1	Lecture Rooms (capacity for 60 students)
2	Laboratory (capacity for 20 students)
3	Computing resources: PC with latest version and hardware/software and utilization of open source and licensed application software

4	Other resources: Appropriate laboratory tools, Chemicals, Glass ware, Apparatus, Instrumentation

12.0. COURSE IMPROVEMENT PROCESSES:

12.1. Strategies for obtaining student feedback on effectiveness of teaching:

Course delivery evaluation by students using: Questionnaire forms and online questionnaires

12.2. Other strategies for evaluation of teaching by the instructor or by the department:

Periodic review by Academic Planning & Monitoring Committee and departmental review committee, Observations and assistance of colleagues, External assessments by advisors/ examiners and auditors.

12.3. Process for improvement of teaching:

Use of ICT tools, teaching aids, Simultaneous practical orientation and theory classes (SPOT), Adoption of reflective teaching.

12.4. Describe the planning procedures for periodically reviewing of course effectiveness and planning for improvement:

Periodic review by departmental meeting, Review of course delivery and outcome through assessment and feedback from all stake holders.

12.5. Course development plans:

Provide inputs for course improvement and update to University Course development Committees (Board of Studies)

13.0. INFORMATION ABOUT FACULTY MEMBER RESPONSIBLE FOR THE COURSE:

Name	Dr. Nikhilkumar S Sakle
Location	Dept of Pharmacology Lab M. Pharm Research lab.
Contact Detail (e-mail &cell no.)	9960659666; nikhilsakle@gmail.com
Office Hours	10:00 AM to 5:00 PM
Name	**Mrs. Khan Dureshahwar (KDR)**

Location	Department of Pharmacology
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