



**Dr. Rafiq Zakaria Campus**

Maulana Azad Educational Trust's

**Y. B. CHAVAN COLLEGE OF PHARMACY**

(B. Pharm, M. Pharm & Research Centre)

ISO 21001:2018 & ISO 14001:2015 CERTIFIED | NIRF-2022 ALL INDIA RANK 65<sup>TH</sup>

**NAAC ACCREDITATION "A" GRADE WITH 3.23 CGPA SCORE**

# COURSE MODULE

<b>Program Title</b>	B. Pharmacy
<b>Department</b>	PHARMACOLOGY
<b>Course Title</b>	PATHOPHYSIOLOGY

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:	<b>PATHOPHYSIOLOGY</b>	
b. Course Number/Code	<b>BP204T</b>	
c. Credit Hours	Theory	Practical
	45 (3 hrs/Week)	-----
d. Study level/semester at which this course is offered	<b>Second Semester B. Pharm</b>	
e. Pre-requisite	Human Anatomy and Physiology	
f. Co-requisite	Require weekly study function of human body chemical, cellular, organ and system level	
g. Program in which the course is offered	B Pharm	
h. Language of teaching the course	English	
i. Prepared by	Dr. Nikhilkumar S Sakle (NSS)	
j. Approved by HOD	Dr. Syed Ayaz Ali	

### 5.2.Course Description:

Pathophysiology is the study of causes of diseases and reactions of the body to such disease producing causes. This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.

### 5.3.Course Objectives:

- Describe the etiology and pathogenesis of the selected disease states;
- Name the signs and symptoms of the diseases; and
- Mention the complications of the diseases.

**6.0.Course Outcomes (COs): (Min. 4 and Max. 6)****(Use Bloom's Taxonomy words)**

<b>CO Code</b>	<b>Course outcome</b>
<b>CO BP204T.01</b>	Apply the basic knowledge of system physiology and their correlations with molecular, biochemical and cellular mechanism in disease state.
<b>CO BP204T.02</b>	Develop the ability to identify and diagnose disease conditions
<b>CO BP204T.03</b>	Outline and plan the problems for clinical manifestations in diseases
<b>CO BP204T.04</b>	Categorize the signs and symptoms of different diseases with respect to normal conditions of body.
<b>CO BP204T.05</b>	Utilization of knowledge for the prophylaxis measures of disease condition

**6.1. Knowledge and Understanding****(Alignment of POs to COs)**

<b>CO Code</b>	<b>Program Outcome (PO)</b>										
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>
<b>CO 204T.01</b>	<b>H</b>	<b>-</b>	<b>-</b>	<b>S</b>	<b>-</b>	<b>H</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>CO 204T 02</b>	<b>H</b>	<b>-</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>M</b>	<b>-</b>	<b>S</b>	<b>S</b>	<b>-</b>	<b>-</b>
<b>CO 204T 03</b>	<b>H</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>S</b>	<b>-</b>	<b>S</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>CO 204T 04</b>	<b>H</b>	<b>-</b>	<b>S</b>	<b>-</b>	<b>-</b>	<b>S</b>	<b>S</b>	<b>M</b>	<b>-</b>	<b>-</b>	<b>M</b>
<b>CO 204T 05</b>	<b>H</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>S</b>	<b>-</b>	<b>M</b>	<b>S</b>	<b>M</b>	<b>H</b>

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
The course typically includes lecture, class discussion, reading assignments, laboratory performance, Digital Method (PPT).	Quiz questions will be drawn from lecture notes, reading assignments and text objectives. Each quiz may consist of multiple-choice, true/false and matching questions.

## 6.3. Tools for the Teaching and learning

Theory subjects	Practical Subjects
<ul style="list-style-type: none"><li>• PowerPoints presentation</li><li>• Videos</li><li>• Flash Card</li><li>• Models</li><li>• Software</li><li>• Charts</li><li>• Smart Boards</li><li>• White boards</li><li>• Online Platform</li></ul>	<ul style="list-style-type: none"><li>• White boards</li><li>• Glassware</li><li>• Chemicals</li><li>• Instruments</li><li>• Equipment</li><li>• Software</li><li>• Models</li><li>• Plants/Crude Drugs</li><li>• Animal</li></ul>

## 6.4.COURSE CONTENT

### 6.1. Theoretical Aspect:

Order	Topic list/units	Subtopics list	Number of Weeks	Contact Hours
1	<b>Basic principles of Cell injury and Adaptation</b>	Introduction, definitions, Homeostasis, Components and Types of Feedback systems, Causes of cellular injury, Pathogenesis (Cell membrane damage, Mitochondrial damage, Ribosome damage, Nuclear damage), Morphology of cell injury, Adaptive changes (Atrophy, Hypertrophy, hyperplasia, Metaplasia, Dysplasia), Cell swelling, Intra cellular accumulation, Calcification, Enzyme leakage and Cell Death, Acidosis & Alkalosis, Electrolyte imbalance	02	05
2	<b>Basic mechanism involved in the process of inflammation and repair</b>	Introduction, Clinical signs of inflammation, Different types of Inflammation, Mechanism of Inflammation – Alteration in vascular permeability and blood flow, migration of WBC's, Mediators of inflammation, Basic principles of wound healing in the skin, Pathophysiology of Atherosclerosis.	02	05
3	<b>Cardiovascular System</b>	Hypertension, congestive heart failure, ischemic heart disease (angina, myocardial infarction, atherosclerosis and arteriosclerosis)	02	05
4	<b>Respiratory system</b>	Asthma, Chronic obstructive airways diseases.	01	03
5	<b>Renal system</b>	Acute and chronic renal failure.	01	02
6	<b>Haematological Diseases</b>	Iron deficiency, megaloblastic anemia (Vit B12 and folic acid), sickle cell anemia, thalasemia, hereditary acquired anemia, hemophilia	01	03
7	<b>Endocrine system</b>	Diabetes, thyroid diseases, disorders of sex hormones	01	03
8	<b>Nervous system</b>	Epilepsy, Parkinson's disease, Stroke, psychiatric disorders: depression, schizophrenia and Alzheimer's disease.	01	03
9	<b>Gastrointestinal system</b>	Peptic Ulcer	01	01
10	<b>Inflammatory</b>	Inflammatory bowel diseases, jaundice, hepatitis (A,B,C,D,E,F) alcoholic liver	01	03

	<b>bowel diseases, jaundice, hepatitis (A,B,C,D,E,F) alcoholic liver disease.</b>	disease.		
	<b>Disease of bones and joints</b>	Rheumatoid arthritis, osteoporosis and gout	<b>01</b>	<b>01</b>
	<b>Principles of cancer</b>	classification, etiology and pathogenesis of cancer	<b>02</b>	<b>04</b>
<b>11</b>	<b>Infectious diseases</b>	Meningitis, Typhoid, Leprosy, Tuberculosis Urinary tract infections	<b>01</b>	<b>04</b>
	<b>Sexually transmitted diseases</b>	AIDS, Syphilis, Gonorrhea	<b>01</b>	<b>03</b>
	<b>TOTAL</b>			<b>45</b>

## 6.2. Practical Aspects :-

Order	Tasks/Experiments	Number of Weeks	Contact Hours
01	<b>Not Applicable</b>		
02			
03			
04			

## 7.0. ASSESSMENT MECHANISM :

Sr. No.	Assessment Mechanism	Week due	Marks	Proportion of Final Assessment
1	Assignments, Exercises & Home works	2 <sup>nd</sup> 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 practicals	15	10%



4	Final exam (theory)	As per University at end of course	75	50%
5	Final exam (Practical)		35	24%
Total			150	<b>100%</b>

#### 8.0.STUDENT SUPPORT:

Office hours/week	Other procedures
<b>Two hours minimum</b>	

#### 9.0.TEACHER'S AVAILABILITY FOR STUDENT SUPPORT:

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Time	<b>04:00-5:00</b>	<b>04:00-5:00</b>	<b>04:00-5:00</b>	<b>04:00-5:00</b>	<b>04:00-5:00</b>	<b>04:00-5:00</b>

#### 10.0. LEARNING RESOURCES:

Sr.No.	Title of Learning Material	Details
1	Text books	Text book of Pathophysiology- Harsh Mohan
2	Essential references (as per syllabus)	Text book of Robin's Pathology Basis of Diseases
3	Reference material	Text books in college library
4	E-materials and websites	You Tube Videos
5	Other learning material	Printed and 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:**

<b>Name</b>	Dr. NIKHILKUMAR S SAKLE
<b>Location</b>	Dept. of Pharmacology M. Pharm Research lab.
<b>Contact Detail (e-mail &amp; cell no.)</b>	9960659666
<b>Office Hours</b>	10:00 AM to 5:00 PM