



**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>	PHARMACOGNOSY
<b>Course Title</b>	PHARMACOGNOSY I

1. **NAME OF INSTITUTION** : Y. B. CHAVAN COLLEGE OF PHARMACY,  
AURANGABAD
2. **AFFILIATED UNIVERSITY** : DR. BABASAHEB AMBEDKAR  
MARATHWADA UNIVERSITY, AURANGABAD
3. **DEPARTMENT** : PHARMACOGNOSY
4. **PROGRAM TITLE** : B. PHARM.II Year

**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:	PHARMACOGNOSY I	
b. Course Number/Code	BP405T	
c. Credit Hours	Theory	Practical
	45(3 Hrs/Week	60 (4Hrs. / Week)
d. Study level/semester at which this course is offered	IVth SEMESTER	
e. Pre-requisite	10+2 Syllabus	
f. Co-requisite	BASICS OF BOTANY AND ZOOLOGY	
g. Program in which the course is offered	B Pharm	
h. Language of teaching the course	English	
i. Prepared by	MRS RESHMA TOSHNIWAL	
j. Approved by HOD	MRS RESHMA TOSHNIWAL	

### 5.2.Course Description:

The subject involves the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them and their medicinal properties

### 5.3. Course Objectives:

1. To know the techniques in the cultivation and production of crude drugs.
2. To know the crude drugs, their uses and chemical nature.
3. Know the evaluation techniques for the herbal drugs.
4. To carry out the microscopic and morphological evaluation of crude drugs.

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

(Use Bloom's Taxonomy words)

CO Code	Course outcome
405.01	Ability to use the techniques in the cultivation and production of crude drugs.

<b>405.02</b>	Ability to know the crude drugs, their uses and chemical nature.
<b>405.03</b>	Applying the techniques for evaluation of the herbal drugs.
<b>405.04</b>	Ability to carry out the microscopic and morphological evaluation of crude drugs.

## 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	
<b>405.01</b>	3	3	3	3	-	-	3	-	3	3	3	
<b>405.02</b>	3	2	3	3	-	-	3	-	3	3	3	
<b>405.03</b>	3	3	3	3	-	-	3	-	3	3	3	
<b>405.04</b>	3	3	3	3	2	2	3	-	3	3	3	

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
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<b>Lectures (Constructivist learning)</b> <b>Collaborative learning (Discussion)</b> <b>Project based Learning</b> <b>Blended learning</b> <b>Inquiry based learning</b> <b>Flash cards</b> <b>Video</b> <b>Equipment models</b>	<b>Formative Assessment</b> <b>Case study</b> <b>Class test</b> <b>Multiple choice questions</b> <b>Assignments</b> <b>Seminar</b> <b>Viva Voce</b> <b>Synopsis</b> <b>Tutorials</b> <b>Summative Assessment</b>
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### 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	Unit I	<b>Introduction to Pharmacognosy:</b>	<b>3 and</b>	<b>10</b>
		(a) Definition, history, scope and development of Pharmacognosy (b) Sources of Drugs – Plants, Animals, Marine & Tissue culture	<b>Half week</b>	

		<p>(c) Organized drugs, unorganized drugs (dried latex, dried juices, dried extracts, gums and mucilages, oleoresins and oleo- gum -resins).</p> <p><b>Classification of drugs:</b> Alphabetical, morphological, taxonomical, chemical, pharmacological, chemo and sero taxonomical classification of drugs</p> <p><b>Quality control of Drugs of Natural Origin:</b> Adulteration of drugs of natural origin. Evaluation by organoleptic, microscopic, physical, chemical and biological methods and properties. Quantitative microscopy of crude drugs including lycopodium spore method, leaf constants, camera lucida and diagrams of microscopic objects to scale with camera lucida.</p>			
2	Unit II	<p><b>Cultivation, Collection, Processing and storage of drugs of natural origin:</b> Cultivation and Collection of drugs of natural origin Factors influencing cultivation of medicinal plants. Plant hormones and their applications. Polyploidy, mutation and hybridization with reference to medicinal plants</p>	Half week	4	
3	Unit III	<p><b>Plant tissue culture:</b> Historical development of plant tissue culture, types of cultures, Nutritional requirements, growth and their maintenance. Applications of plant tissue culture in pharmacognosy.</p>	2 week and 1 lecture	7	

		Edible vaccines		
4	Unit IV	<b>Pharmacognosy in various systems of medicine</b> Role of Pharmacognosy in allopathy and traditional systems of medicine namely, Ayurveda, Unani, Siddha, Homeopathy and Chinese systems of medicine. <b>Introduction to secondary metabolites:</b> Definition, classification, properties and test for identification of Alkaloids, Glycosides, Flavonoids, Tannins, Volatile oil and Resins	2 and half week	10
5	Unit V	Study of biological source, chemical nature and uses of drugs of natural origin containing following drugs <b>Plant Products:</b> Fibers-Cotton, Jute, Hemp Hallucinogens, Teratogens, Natural allergens <b>Primary metabolites:</b> General introduction, detailed study with respect to chemistry, sources, preparation, evaluation, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and/or Medicines for the following Primary metabolites: <b>Carbohydrates:</b> Acacia, Agar, Tragacanth, Honey <b>Proteins and Enzymes :</b> Gelatin, casein, proteolytic enzymes (Papain, bromelain, serratiopeptidase, urokinase, streptokinase, pepsin). <b>Lipids (Waxes, fats, fixed oils) :</b> Castor oil, Chaulmoogra oil, Wool Fat, Bees Wax	2 and half week	8



		<b>MarineDrugs:</b> Novel medicinal agents from marine sources		
	<b>TOTAL</b>			<b>45</b>

## 6.2.Practical Aspects

Order	Name of Experiment	Number of Weeks
<b>1</b>	Analysis of crude drugs by chemical tests: (i)Tragacanth (ii) Acacia (iii)Agar (iv)Gelatin (v) starch (vi) Honey (vii) Castor oil	<b>1</b>
<b>2</b>	Determination of stomatal number and index	
<b>3</b>	Determination of vein islet number, vein islet termination and palisade ratio.	
<b>4</b>	Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer	
<b>5</b>	Determination of Fiber length and width	
<b>6</b>	Determination of number of starch grains by Lycopodium spore method	
	Determination of Ash value	
<b>8</b>	Determination of Extractive values of crude drugs	
<b>9</b>	Determination of moisture content of crude drugs	
<b>10</b>	Determination of swelling index and foaming	

## 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>	e-mail,can meet personally

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

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Time	<b>12:00-1:00</b>	<b>12:00-1:00</b>	<b>12:00-1:00</b>	<b>12:00-1:00</b>	<b>12:00-1:00</b>	<b>12:00-1:00</b>

## 10.0. LEARNING RESOURCES:

Sr. No.	Title of Learning Material	Details
1	Text books	
2	Essential references (as per syllabus)	1. W.C.Evans, Trease and Evans Pharmacognosy, 16 <sup>th</sup> edition, W.B. Saunders & Co., London, 2009. 2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9 <sup>th</sup> Edn., Lea and Febiger, Philadelphia, 1988. 3. Text Book of Pharmacognosy by T.E.

		Wallis 4. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi. 5. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37 <sup>th</sup> Edition, Nirali Prakashan, New Delhi. 6. Herbal drug industry by R.D. Choudhary (1996), 1 <sup>st</sup> Edn, Eastern Publisher, New Delhi. 7. Essentials of Pharmacognosy, Dr.SH.Ansari, 1 <sup>st</sup> edition, Birla publications, New Delhi, 2007 8. Practical Pharmacognosy: C.K. Kokate, Purohit, Gokhlae 9. Anatomy of Crude Drugs by M.A. Iyengar
3	Reference material	Books, Research and Review articles
4	E-materials and websites	Powerpoint presentation, video demonstration
5	Other learning material	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>	MRS RESHMA TOSHNIWAL
<b>Location</b>	M'PHARM PHARMACEUTICS LAB
<b>Contact Detail (e-mail &amp; cell no.)</b>	<a href="mailto:soni21774@yahoo.com">soni21774@yahoo.com</a> , 9823431300
<b>Office Hours</b>	10:00 AM to 5:00 PM

<b>Name</b>	MRS RESHMA TOSHNIWAL
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<b>Contact Detail (e-mail &amp; Cell No.)</b>	<a href="mailto:soni21774@yahoo.com">soni21774@yahoo.com</a> , 9823431300
<b>Office Hours</b>	10:00 AM to 5:00 PM