COURSE MODULE

Program Title	B. Pharmacy
Department	Pharmaceutical Chemistry
Course Title	Medicinal Chemistry-III

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

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

3. **DEPARTMENT** : PHARMACEUTICAL CHEMISTRY

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:	**Medicinal Chemistry-III**

b. Course Number/ Code	BP601T		
c. Credit Hours	**Theory**	**Practical**	**Total**
	45 (3hr/wk)	**_____**	**45(3hr/wk)**
d. Study level/ semester at which this course is offered	**VI Semester B.Pharm**		
e. Pre-requisite	**MC-II**		
f. Co-requisite	**Basics of Medicinal Chemistry and Organic Compunds**		
g. Language of teaching the course	**English**		
h. Prepared by	**Dr. Shahed Mirza and Mr. Altamash Ansari**		
i. Approved by	**Dr. K.G.Baheti**		

5.2.Course Description:

Pharmaceutical Medicinal Chemistry –II is the branch of Pharmacy which deals with the biological activity of the compounds of different category. Which develop the linkage between organic molecules and their transformation to the drug and ability to name drugs having various structural features with classification, ADME, SAR study , MOA and side effect of respective drugs.

5.3. Course Objectives:

1. Interpretation and application of IUPAC rules for nomenclature.
2. To memories different classes of compounds on the basis of chemical class and biological activity
3. To explain physicochemical properties, mode of action and SAR of different class of medicinal compounds.
4. To recognize and describe the drug and receptor interaction.
5. To outline the synthesis of drug compounds.

5.4. Course Outcomes (CO):(around 5 to 8)

(e.g. CO101.1 (CO - course code, 101 subject code as per syllabus, & .1 is first CO)

Code	Course outcome
CO 601.01	Interpretation of IUPAC names of compounds
CO 601.02	To memorize the classification of all therapeutic classes and mechanism of action
CO 601.03	knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
CO 601.04	Knowledge about receptor interaction of drugs with software

CO 601.05	Discovery and ability to develop novel drugs with receptor interaction of drugs in body

5.4.1 Alignment of PO to CO: (PO: Program Outcome; CO: Course Outcome)

Course code (CO)	Program Outcome (PO)										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 601.01	**H**	**L**	**H**	**L**	**M**	**M**	**M**	**L**	**L**	**M**	**-**
CO 601.02	**H**	**H**	**H**	**L**	**L**	**L**	**M**	**L**	**L**	**M**	**L**
CO 601.03	**H**	**M**	**L**	**H**	**M**	**L**	**L**	**H**	**H**	**L**	**H**
CO 601.04	**H**	**M**	**H**	**L**	**M**	**-**	**M**	**L**	**L**	**M**	**-**
CO 601.05	**L**	**M**	**L**	**M**	**H**	**L**	**M**	**L**	**L**	**-**	**-**

Correlation levels 1, 2 or 3 as defined below:
1: Slight (Low); 2: Moderate (Medium); 3: Substantial (High); If there is no correlation, put '-'

5.4.2 Teaching and Assessment Methods for achieving learning outcome:

Teaching Strategies /methods used	Methods of Assessment
Explanation	Assignment
Structural activity relationship study	Power point Presentation
Interactive session	Examination
Assessment driven individual teaching	Class test
Brain storming	Slow learner students
Seminars	Presentations (Oral –viva/voce)

6. COURSE CONTENTS:

6.1. Theoretical Aspect:

Order	Topic list/units	Subtopics list	Contact Hours
01	**Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs superscripte**	Antibiotics	5
02		Anti-TB	5
03		UTIS	5
04		Antiviral	5
05		Antifungal	5
06		Anti-Protozoal	5
07		Anthelmintcs	5
08		Sulphonamides and sulphone	5
09		Folate reductase inhibitors	1
10		Introduction to Drug Design	2
11		Combinatorial Chemistry	2

6.2. Practical Aspect (If Any):

Order	Subtopics list	Contact Hours/Week
01	Preparation of Intermediated	4
02	Assay of Drugs	4
03	Preparation of medicinally important compounds	4

04	Drawing structure and reactions using chem. draw	4
05	Determination of physicochemical properties such as logP, clogP, MR, Molecular weight, Hydrogen bond donors and acceptors for class of drugs course content using drug design software Drug likeliness screening (Lipinskies RO5)	4

6.3. Assignments/Tutorials:

1. IUPAC and structural property
2. Classification SAR and MOA of following drugs

A. Anticancer and antihistaminic agents

B. Drugs acting on cardiovascular system

C. Steroids. Corticosteroids [gluco- &mineralocorticoids] &anti- inflammatory steroids, Sex hormones and their synthetic analogs (Male & female contraceptive Agents, anti-fertility agents), Anabolic steroids

7. SCHEDULE OF ASSESSMENT TASKS DURING THE SEMESTER:

Sr. No.	Assessment Method	Week due	Marks	Proportion of Final Assessment
01	Assignments, Exercises & tutorials		10	5%
02	Sessional (Internal Theory exam)		20	10%
03	Continuous Practical Assessment (Sessional Practical exam)	Weekly during practicals	10	5%
04	Final exam (theory)	As per University at end of course	80	40%
05	Final exam(practical)		80	40%
Total			200	100%

8. STUDENT SUPPORT:

Office Hours/Week	Other Procedures
Two hours minimum	e-mail, etc

9. TEACHER'S AVAILABILITY FOR STUDENT SUPPORT:

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Time	✓	✓	✓	✓	✓	✓

10. LEARNING RESOURCES:

Sr. No.	Title of Learning Material	Details
01	Text books	A. Wilson C.GisvoldO.,&Doerge.J.B., TextBookOf Org PharmaceuticalChemistry,B.LippincotCompany. B. FoyeW.O., PrinciplesOf MedicinalChemistry, K., E., Varghese&Company C. Medicinal Chemistry by Kadam Mahadik volume 1 And 2.

02	Essential references (as per syllabus)	o Wilson C.GisvoldO.,&Doerge.J.B., TextBookOf OrganicMedicinal& PharmaceuticalChemistry, Lippincot Company. o FoyeW.O., Principles Of Medicinal Chemistry, K., E.,Varghese & Company •Medicinal Chemistry by Kadam Mahadik volume 1 and 2.
03	Reference material	**Self notes and University Question Papers**
04	E-materials and websites	Online You tube videos of Mode of action of different drugs
05	Other learning material	

11. FACILITIES REQUIRED:

Sr. No.	Particular of Facility Required
01	Lecture Rooms (capacity for 60 students)
02	Laboratory (capacity for 20 students)
03	Computing resources: P-IV-PCs with recent hardware/ utilization of open source and licensed application software
04	Other resources: Appropriate laboratory tools, Chemicals, Glass ware, Apparatus, Instrumentation

12. 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 review committee, 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. INFORMATION ABOUT FACULTY MEMBER RESPONSIBLE FOR THE COURSE:

Name	**Dr. Shahed Mirza and Mr. Altamash Ansari**
Location	YBCCPA
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