

Dr.D.Y.Patil University,
Dr.D.Y.Patil Medical College, Pimpri, Pune – 18
Department of Pharmacology

Medical faculty – Syllabus for the degree of M.Sc. Medical Pharmacology

The overall goal of the course is to develop expertise in the field of Pharmacology. A process of rational thinking and cogent action will be inculcated in an individual so that he/she shall be competent to pursue various activities as demanded by the profession as Pharmacologist.

Goals :

1. To understand pharmacology with understanding of the rational use of drugs and to prepare good quality teachers.
2. Introducing students to advances in teaching technology, computer Aided Learning, internet patent laws and procedures etc.
3. To orient students for research & developments.

Objectives :

To achieve this goal, the following objectives must be fulfilled. At the end of course in Pharmacology the trained specialist shall be able to

Cognitive domain :

1. Apply basic principles of pharmacology and evaluation of new drugs.
2. Collect and analyse experiment and related to drug kinetics or dynamics.
3. Interpret the analyzed data with reasonable accuracy and derive logical conclusions.
4. Provide appropriate advice related to selection of drug, drug usage (desirable and undesirable effects, kinetics, interactions), Precautions and measures to be taken during administration of drug and treating the ADRs in a given patient taking consideration physiological, psychological & pathological features.
5. Audit drug utilization and drug related adverse events.
6. Assess emergency situations while carrying out drug trials and institute emergency management till appropriate assistance from clinical side is available.
7. Develop the ability for continued self-learning so as to update the knowledge of recent advances in the field of Pharmacology and allied fields.

8. Be competent to teach and train undergraduate and future postgraduate medical students and Junior doctors in Pharmacology and Therapeutics as well as nurses and paramedical staff in Medical Colleges, Institutions and other hospitals.
9. Plan and carry out both laboratory with adherence to scientific methodology and GLP/ GCP guidelines .
10. Be aware of legal and ethical aspects of drug evaluation.
11. Communicate the findings, results and conclusions of scientific research, both verbally and in writings.
12. Be aware of regulatory procedures needed to be carried out prior to the marketin of a new drug in India.

Psychomotor domain :

1. Perform common experimental techniques required for evaluation of new drug with competence.
2. Perform common clinical procedures required for evaluation of drug in normal volunteers and patients with competence.
3. Organize and manage administrative responsibilities for routine day to day work as well as new situations.
4. Use teaching-learning media effectively.

Affective domain :

1. Appreciate socio psychological, cultural and environmental factors affecting health and drug usage.
2. Appreciate the importance and implementation of National Health Programmes in context to rational drug utilization.
3. Be aware of the importance of cost effectiveness in patient management.
4. Be aware of service activities which a pharmacologist can undertake viz. therapeutic drug monitoring , ADR monitoring, drug informations services, poison control control center, drug auditing, etc.
5. Adopt ethical principles while conducting experimental and human research.
6. Develop communication skills to interact with patients ,pre and paramedical staff.
7. Realize the importance of team work.
8. Develop attitudes required for professional responsibilities

COURSE DETAILS :

Duration of the course- 36 months (6 semesters, 3 calendar year)

First semester –

1. Students shall undergo training programme in anatomy, physiology and biochemistry & Microbiology.
2. Selection of dissertation topic and submission of protocol for ethical clearance and research committee.
3. Term end test-theory & practical.

Second Semester

1. Introduction to pharmacology and its branches.
2. Dissertation work continuation
3. PG activity

Third Semester

1. Rotation in labs.
2. Teaching duties and postgraduate activity
3. Dissertation work continuation

Fourth Semester

1. Teaching duties, postgraduate activity
2. Dissertation work continuation
3. Experimental pharmacology techniques
4. Term end examination

Fifth Semester

1. Dissertation work continuation
2. Teaching duties, postgraduate activity
3. Experimental pharmacology techniques
4. Term end examination

Sixth Semester

1. Dissertation completion 6 months before final examination
2. Teaching duties, postgraduate activity.
3. Prelim examination – theory & practical.

TEACHING LEARNING OPPORTUNITIES

Learning and teaching opportunities will essentially be self directed and will involve

1. Teaching / Academics / Personality Development related topics :

1. Microteaching/TOS (teachers oriented sessions)
2. Teaching experiences : The candidate will be regularly involved in the teaching, of undergraduate medical, dental and nursing students.
3. Participation & conduction workshops and conference/s & CMEs
4. Journal reporting – Student should present at least 20 in total course.
5. Evaluation of the journal/seminar should be done by teachers on 5 points
Eg. Presentation , completeness, A-V aids use, understanding, overall performance.
6. Presentation skills/group discussions
7. Knowledge about patients ,information processing requirements (IPRS) etc
8. Computer aided learning (CAL)
9. Web searching for medical literature
10. Scientific paper writing etc.

2. Experimental Pharmacology

Animal experiments – ethics, limits, research insights, animal house.

-Screening methods for drug evaluations and experimental models – general and -specific screening.

-Drug assays.

-Methods of assays

-Toxicological screening.

-Biostatistics.

-Principles of analytical instruments.

-Basics of Computers in pharmacology , data base creation.

-To know the effects of various drugs on BP in experimental animals.

3. Clinical Pharmacology

Would include all aspects related with drug trials..... ICH--- GCI guidelines, ICMR Guidelines.

Role of DCI/DCGI.

Protocol designing

Basic statistics.

Laws related to drug research including ayurvedic/herbal drugs.

Taking informed consent etc.

Ethics.

ADR Monitoring..

Pharmacoepidemiology, utilization studies.

Drug estimations in biological fluids.

Sources of drug information, DATA INTERPRETATIONS.

Advances in clinical pharmacology.

Essential drug listing

4. Drug store management

One week posting in drug store & hospital in 4th term.

Functions of drug store

Role of pharmacist in drug store.

ABC/VED classification of drugs.

Use of computers in drug store, routine administration.

5. Log book write-ups : (To be filled by students as provided in the format)

Main purpose of the log book should be to document the work done (experimentations, journals, dissertation work, seminars, workshop etc)

The content of the log book work to be signed only by the Guide/PG teaching In charge/HOD. Example of evaluation sheet format given below :

Heading	Comments			
Assembly				
Cleanliness				
Instruments used				
Technique				
Results/interpretation				
Discussion : Theory				
Discussion : Practical				
Overall remarks	Excellent	Good	Fair	poor

6. Seminar presentation in department :

It should be taken care that each student presents at least 20 seminars during the entire tenure and topics could be divided as per the following format

1st term

Postgraduate activity

2nd term

Physiology -1

Biochemistry -1

Anatomy -1

Microbiology-1

3rd term

Gen. pharmacology – 2

Evaluative methods of drugs -2

4th term

ANS-2
CNS -2

5th term

CVS-2
Endo -2

6th term

Chemotherapy-2
Autacoids – 1
Recent Advances – 1

DESIRABLES :

1. CRO visits in 4th term : to be done by the students in fourth term for 1-2 months in reputed CRO (short listed by University/department) to make the students to have hands on experience in pharmaceutical industry work.

OR

Incase this is not possible then 10-15 days workshop on clinical pharmacology in reputed institutes would be desirable.

Dissertation Objective :

1. To make aware the post graduate student about every aspect of research. This involves finding research topic, searching literature, research methodology, Statistics, analysis, scientific writing and many other aspects involved.
2. The topic or project taken need not necessarily bring out/explore something very novel, very big or breakthrough in medical science. The main aim is to train post graduate students for taking up such challenges in the future and learn maximum about the research development during their curriculum. Dissertation topic along with plan of work is to be allotted by the guide within one year. The study could be prospective or retrospective and to be cleared by

appropriate ethic committee. (Topics not be repeated for three years) The subject of dissertation countered by the postgraduate student and head of the dept. of the institutes should be submitted to the university within one year of registration if the topic is changed, it should be communicated to university within one and half year of registration. Dissertation presentation would be done two times, first presentation before protocol submission and last before final submission.

Four copies of completed dissertation with appropriate certificates should be submitted at the end of fifth semester.

Four examiners will examine these dissertation and report acceptance or otherwise, (three out of four have to accept the dissertation for its final acceptance by the university). If two examiners accept the dissertation, Chairman BOS will take final decision. Non acceptance should be justified with reason thereof.

Examination Pattern

Yearly exam could be taken if needed by the individual department and should not be mandatory.

Final Examination

Theory

Theory will be four question papers of 3 hour duration, each of 100 marks. Each question paper will have 4 questions.

Paper I- Experimental Aspects of Pharmacology & Toxicology Biostatistics

Paper II- Theoretical Aspects of Pharmacology and Toxicology

Paper III- Applied pharmacology

Paper IV- Recent Advances in Pharmacology & Toxicology

- | | |
|---|-----------|
| 1) Question 1 | 20 marks |
| 2) Question 2 | 20 marks |
| 3) Question 3 | 20 marks |
| 4) Question 4 Short notes (10 marks each) | No choice |

Marking Scheme of theory examination

	Total marks	Minimum marks per Paper
Paper I	100	40
Paper II	100	40
Paper III	100	40
Paper IV	100	40
	Total Marks 400	200

{The candidate should score minimum 40 marks per paper and 200 of total 400 marks in theory i.e. 50%}

Practical Examination:

Total Marks 400

- 1) Long tissue experiment (one) **75 marks.**
Isolated tissue experiment including Bioassay
Determine the conc. of drug using suitable isolated tissue preparation.
- 2) Short Experiments (any two) 50 marks each **100 marks.**
 - a) Drug screening procedures
 - b) Drug evaluations
 - c) Protocol design
- 3) Technique Demonstrations **75 marks**
 - a) Oral feeding 35 marks
 - b) Blood collection in lab. animals/ I.V inj in experimental animals 40 marks
- 4) Equipments and instruments used in pharmacological experiments and drug research **50 marks.**
Explain the principle of working & uses of commonly used instruments and equipments in pharmacology.
- 5) Grand viva **-100 marks**
 - a) Theory viva 75 marks
 - b) Dissertation viva 25 marks