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:**

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

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

**Cognitive domain:**

1. Apply basic principles of pharmacology and therapeutics to practice rational use of existing drugs and evaluation of new drugs.
2. Collect and analyse experimental and clinical data 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 into 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 exigency 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 and clinical research with adherence to scientific methodology and GLP/GCP guidelines
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 marketing 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) Carry out necessary resuscitative measures in emergency situations arising during drug evaluation
5) 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 information services, poison control centre, drug auditing etc.

5) Adopt ethical principles while conducting experimental and human research

6) Develop communication skills to interact with patients, peers and paramedical staff

7) Realize the importance of team work

8) Develop attitudes required for professional responsibilities.
Learning and teaching opportunities will essentially be self directed and will involve

1. **Experimental Pharmacology**
   1) Animal experiments-ethics, limits, research insights, animal house.
   2) Screening methods for drug evaluations and experimental models-general and specific screening
   3) Drug assays
   4) Methods of assays
   5) Toxicological screening
   6) Pharmacokinetics experiments
   7) Biostatistics
   8) Principles of analytical instrumentation
   9) Basics of Computers in pharmacology, data base creation

2. **Clinical Pharmacology:**
   1) Would include all aspects related with drug trials….ICH –GCP guidelines, ICMR guidelines,
   2) Role of DCI/DCGI,
   3) Protocol designing,
   4) Basic statistics,
   5) Laws related to drug research including ayurvedic /herbal drugs,
   6) Taking informed consent etc.
   7) Ethics
   8) ADR Monitoring
   9) Therapeutic Drug monitoring
   10) Pharmacoepidemiology, utilization studies
   11) Drug estimations in biological fluids
   12) Sources of drug information, Data Interpretations
   13) Advances in clinical pharmacology
   14) Essential drug listing
3. Drug store management

1) Functions of drug store,
2) Role of pharmacologist in drug store,
3) ABC/VED classification of drugs,
4) Use of computers in drug store, routine administration,

4. Teaching/Academics/personality development related topics:

1) Microteaching/ TOS (teachers oriented sessions)

Teaching experiences: The candidate will be regularly involved in the teaching of undergraduate medical and nursing students

2) Conducting mock workshop/s and conference/s.
3) Presentation skills /group discussions.
4) Knowledge about patents, IPRS etc

5. Clinical case discussions:

- Post diagnosis discussions on 5 cases from clinical side.
- Documentation of these cases in logbook.

6. Computer simulated dog BP and other experimental exercises:

- Identification of unknown drug on Computer simulated dog BP exercise.
- Computer aided learning (CAL)

7. Scientific publications

- Web searching for medical literature.
- Scientific paper writing and publication etc.
Desirables:

1) Drug level monitoring

Hands on experience with HPLC, HPTLC, spectrophotometry.

2) CRO visits: to be done by the student in fourth term for 1-2 months in reputed CRO (shortlisted by university / department) to make the students to have hands on experience in pharmaceutical industry work. Incase this is not possible then **10-15 days workshop on clinical pharmacology** in reputed institutes would be desirable.

3) Inclusion of topics like pharmacoeconomics, pharmacovigilance, Pharmacogenetics, pharmacoepidemiology. National health programmes and chronopharmacology and Nanopharmacology would be desirable.
SYLLABUS

Theory

Clinical and Basic Sciences as applied to Pharmacology

- Central Nervous System
- Autonomic Nervous System
- Cardiovascular System
- Hematopoietic System
- Kidney/Renal System
- Endocrinology
- Respiratory System
- Gastrointestinal System
- Microbial resistance
- Regulation of cell growth and differentiation

General Pharmacology

- Important landmarks in the growth and development of Pharmacology,
- Important contributions of renowned Indian and foreign Pharmacologists
- Principles and modes of drug administration, source, nature and preparations of drugs
- Qualitative and Quantitative Pharmacokinetics
- Pharmacodynamics
- Drugs interactions, Adverse drug reactions
- Methods of new drug development
- Factors modifying drug response
- Pharmacogenetics and pharmacogenomics

Systemic Pharmacology

- Autonomic nervous system
- Central nervous system
- Cardiovascular system
- Hematopoietic system
- Respiratory system
- Autacoids
- Gastrointestinal system
- Renal pharmacology
- Endocrine pharmacology
- Chemotherapy
- Miscellaneous: Vitamins, heavy metals, vaccines & sera, antiseptics etc.
Clinical Pharmacology & Therapeutics

- Rational basis of therapeutics (P-drug concept, Essential drugs)
- Rational drugs
- Human and Population Pharmacokinetics
- Clinical drug evaluation
- Clinical trial designing
- Clinical trial ethics
- Medico-legal aspects of clinical trials

Pharmacovigilance

- Drugs and Cosmetics Act
- Data archiving and management
- Drug audit (Pharmacoepidemiology, Pharmacoeconomics)
- Evidence Based Medicine
- Statutory and legal requirements for conduct of clinical trials (including drug schedules)

Quantitative and Experimental Pharmacology and Preclinical evaluation of new drugs and toxicity studies

- Study design
- Biostatistics
- Bioassay
- Drug-receptor interactions and response including pD$_x$ and pA$_x$ values.
- Step up and step down methods for LD
- CPCSEA
- Alternatives to animal experiments (cell culture, cell lines)

Screening for Pharmacological activity with special reference to the following activities:

- Analgesic-Antipyretic
- Anticonvulsant
- Sedative-hypnotics
- Anti-psychotic
- Anti-depressant
- Anti-parkinsonian
- Anti-diabetic
- Autonomic
- Anti-anginal
- Anti-arrhythmic
- Hypotensive
• Diuretic
• Hypoglycaemic
• Anti-inflammatory
• Anti-secretory
• Anti-allergic
• Local anesthetic
• Smooth muscle
• Anti-fertility
• Anti-cancer

Practical

Experimental Pharmacology: (would be conducted as per the UGC and MCI guidelines revised time to time)

Handling of animals, collection of blood and urine samples.
Assembly of organ bath and setting of thermostat.
Isolated tissue preparations:
To prepare log dose response curve of a suitable drug on:
• Guinea pig ileum.
• Guinea pig tracheal chain
• Guinea pig vas deferens
• Frog rectus abdominis
• Rabbit atrium
• Rat colon
• Rat uterus
• Rat gastric fundus
• Rat anococcygeus muscle
To perform four-point bioassay of a suitable drug on:
• Guinea pig ileum
• Guinea pig vas deferens
• Rat colon
• Rat uterus
• Rat gastric fundus
• Frog rectus abdominis

❖ To prepare cumulative log dose response curve of a suitable drug on rabbit aorta.
❖ To study the stimulatory and depressant effects of drugs on rabbit gut.
❖ To study the effect of coronary vasodilator drug on perfused rabbit heart (Langendroff’s technique).
- Determination of ED50 of histamine on guinea pig ileum.
- Determination of ED50 of acetylcholine on frog rectus abdominis muscle.
- Determination of pD2 values of histamine on guinea pig ileum.
- Determination of pD2 value of acetylcholine on frog rectus abdominis muscle.
- Determination of pA2 value of acetylcholine on guinea pig ileum.
- To study the effect of unknown drugs using rabbit eye.
- To study the stimulatory and depressant effects of drugs on Blood Pressure of rat.
- Screening Tests on animals to study the following activities:
  - Motor in-coordination
  - Anxiolytic effect
  - Despair behavior
  - Anticonvulsant effect
  - Diuretic activity
  - Spontaneous motor activity
  - Analgesic effect
  - Conditioned Avoidance Response
  - Antipsychotic effect
  - Anti-inflammatory effect
  - Clinical/human experiments:

To study the effect of following activities in healthy human volunteers:

To demonstrate the use of any model as an experimental tool on human subjects without administration of any drug/beverage for evaluation of analgesic activity, psychomotor function, cardiac parameters (HR, BP)
  - Physical stress
  - Mental stress
  - To determine lung volumes

To perform:
  - EEG
  - Nystagmography
  - Spirometry
  - ECG
  - Treadmill test/Bicycle ergometry/Master Step test
  - Psychomotor tests
Chemical analysis:
To do chemical estimation of various drugs including sulphonamides and salicylates, chemical identification of alkaloids, glycosides and basic chemical parameters like blood sugar levels, blood urea levels, lipid profile etc.

Computer Aided Learning (CAL) Program:
- Proficiency in using CAL programs for demonstration of effects of drugs on animals.
- Statistics
- Use of calculators and electronic spread sheets for understanding of:
  - Elements of data collection and presentation of data
  - Measures of central tendency and dispersion
  - Non parametric tests
  - Parametric tests (including ANOVA)
  - Correlation and regression

Skills:
The candidates should be conversant with the following techniques:
- Weighing technique (chemicals & animals)
- Handling of equipment
- Handling of small animals including various anaesthetic techniques.
- Recording of blood pressure (In vivo and Computer Assisted Learning program)
- Administration of drugs/chemicals to animals (parenteral and enteral routes)
- Screening of drugs using appropriate models
- Isolated tissue preparations for log dose response curve and bioassay
- Use of Cartesian and log graph paper
- Use of various methods to evaluate drug effects in humans
- Elementary principles of common chemical techniques such as colorimeter, spectrophotometer, flame photometer etc.
- Use of appropriate statistical techniques to analyze the results
Job Responsibilities

- To maintain a log book on daily basis
- To maintain daily record of post graduate activities including:
  - Practical exercises
  - Statistics exercises
  - Pharmacokinetic exercises
  - PG teaching schedule
- To maintain the laboratory equipment allotted to them
- To prepare and organize undergraduate and postgraduate practicals

Teaching Program

Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skill oriented. Learning in postgraduate program is essentially self directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

Teaching sessions

The postgraduate students should attend all undergraduate classes taken by their teachers and colleagues and should also be involved in supervised undergraduate teaching. In addition, there should be daily sessions of formal teaching. Each MD student has to present seminars, Journal clubs, Drug Reviews and perform practicals. He/she should be allotted time for thesis related work.

Course Details and Timeline of the Course

Duration of the course -36 months [6 semisters]

First year
1. Introduction to pharmacology and its branches.
2. Selection of dissertation topic
3. Rotation in labs
4. Teaching duties
Second year
1. Teaching duties
2. Extra mural posting like clinical posting
3. Dissertation work
4. Rotation in labs

Third year
1. Dissertation completion
2. Teaching duties
3. Rotation in labs

For this following topics could be included in theory/practicals of MD (pharmacology)

Teaching Schedule

Following is the suggested departmental teaching schedule:

Item Frequency

1. Thesis work       Once a week
2. Journal club/Drug review     Once a week
3. Practical (Experimental/Chemical/Human)   Once a week
4. Seminar         Once a week
5. Statistical exercise     Once a fortnight
6. Pharmacokinetic exercise     Once a fortnight
7. Formative Assessment  Once at end of term
8. Internal Assessment    Once a year

<table>
<thead>
<tr>
<th>Day</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>MONDAY</td>
<td>Statistical exercise /Pharmacokinetic exercise</td>
</tr>
<tr>
<td>TUESDAY</td>
<td>Journal club-Drug Review</td>
</tr>
<tr>
<td>WEDNESDAY</td>
<td>Thesis work discussion &amp; Review</td>
</tr>
<tr>
<td>THURSDAY</td>
<td>Practical (Experimental/Chemical/Human)</td>
</tr>
<tr>
<td>FRIDAY</td>
<td>Seminar</td>
</tr>
<tr>
<td>SATURDAY</td>
<td>Rational Pharmacotherapy /ADR</td>
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<tr>
<td></td>
<td>Pharmacovigilance/Videofilm/Case Presentation.</td>
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</tbody>
</table>

Apart from above, students will study for thesis, academics & their self development.

Note:

- All PGs are supposed to attend the sessions.
- Attendance of the residents at various sessions (including central sessions) should be at least 80%


**Thesis**

**Objectives:**

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 department of the institute 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.

3. Dissertation presentation would be done two **times**, first presentation before protocol submission and last before final submission. Seven Copies of completed dissertation with appropriate certificates should be submitted at the end of fifth semester with one soft copy. Four examiners will examine these dissertations 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 reasons thereof.

4. Every candidate shall carry out work on an assigned research project under the guidance of a recognized Postgraduate Teacher; the project shall be written and submitted in the form of a Thesis. Every candidate shall submit thesis plan to the University within the time frame specified by the university. Thesis shall also be submitted to the University within the time frame stipulated by the University.

5. The student will:
   
   (i) Identify a relevant research question;
   
   (ii) Conduct a critical review of literature;
(iii) Formulate a hypothesis;
(iv) Determine the most suitable study design;
(v) State the objectives of the study;
(vi) Prepare a study protocol;
(vii) Undertake a study according to the protocol;
(viii) Analyze and interpret research data, and draw conclusions;
(ix) Write a research paper

**Assessment**

**General Principles**

- The assessment should be valid, objective, and reliable
- It should cover cognitive, psychomotor and affective domains
- Formative, continuing and summative (final) assessment should also be conducted in theory as well as practicals. In addition, thesis should also be assessed separately

**Academic Assessment**

All the PG residents should be assessed daily also periodically for their academic activities by all teachers. All the teaching sessions shall be assessed by the faculty members at the end of each session and marks should be given out of 10 (for participant) & 100 (for presenter) and kept in the office for the purpose of calculation of internal assessment

**Formative Assessment**

The formative assessment should be continuous as well as end-of-term. The former is to be based on the feedback from the departmental faculty. End-of term assessment should be held at the end of each semester (upto the 5th semester). Formative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate.

**Internal Assessment**

The performance of the Postgraduate student during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student.
For Theory –
There will be theory paper of 100 marks for 3 hrs once a year. There will be 2 End of year exams and one preliminary exam similar to university exam consisting of four papers.

For Practical –
One preliminary practical similar to university pattern of 400 marks would be conducted.

Summative Assessment

Ratio of marks in theory and practical will be equal
The pass percentage will be 50%

Candidate will have to pass theory and practical examination separately.

Examination Pattern:

A. Theory Examination (Total =400)

<table>
<thead>
<tr>
<th>Title</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Paper 1: Clinical and other Basic Sciences as related to Pharmacology</td>
<td>100</td>
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<tr>
<td>Paper 2: General &amp; Systemic Pharmacology</td>
<td>100</td>
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<tr>
<td>Paper 3: Experimental &amp; Clinical Pharmacology</td>
<td>100</td>
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<tr>
<td>Paper 4: Recent Advances in Pharmacology</td>
<td>100</td>
</tr>
</tbody>
</table>

There shall be four theory papers at M.D examinations, of 100 marks each.

Each Paper shall be of 3 hours duration.

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Nature of Questions</th>
<th>Division of Marks</th>
<th>Total Marks</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Long Answer Question</td>
<td>1 X 25</td>
<td>25 Marks</td>
</tr>
<tr>
<td>2</td>
<td>Long Answer Question</td>
<td>1 X 25</td>
<td>25 Marks</td>
</tr>
<tr>
<td>3</td>
<td>Attempt any 5 SAQs out of Six</td>
<td>5 x 10</td>
<td>50 Marks</td>
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<td>(a) (b) (c) (d) (e) (f)</td>
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<tr>
<td>Sr. No</td>
<td>Exercise</td>
<td>Marks</td>
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<tr>
<td>Day One</td>
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<tr>
<td>1</td>
<td>Long Experiment</td>
<td>50</td>
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<tr>
<td>2</td>
<td>Spots (Practical work from UG curriculum)</td>
<td>25</td>
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</tr>
<tr>
<td>3</td>
<td>Short Experiment (Animal models)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Short Experiment (Human models)</td>
<td>25</td>
<td></td>
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<tr>
<td>5</td>
<td>Journal reading/ Recent Advances</td>
<td>25</td>
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<tr>
<td>6</td>
<td>Thesis Presentation</td>
<td>50</td>
<td></td>
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<tr>
<td>Day two</td>
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<tr>
<td>7</td>
<td>Pharmacovigilance &amp; ADR reporting</td>
<td>25</td>
<td></td>
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<tr>
<td>8</td>
<td>Short Experiment (Chemical exercise)</td>
<td>25</td>
<td></td>
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<tr>
<td>9</td>
<td>Evaluation of teaching abilities (Microteaching)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Case Study (Rational Pharmacology)</td>
<td>25</td>
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<tr>
<td>11</td>
<td>Grand Viva</td>
<td>100</td>
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</table>

01 LONG QUESTION

A) Bioassay: Guinea Pig ileum/Frog rectum/Rat colon/Rat uterus/Rat fundus or Intact animal experiments.

B) Demonstration of experimental technique and equipment handling -

Or

A) Qualitative analysis of given drug on CNS in experimental models (Ratarod, Cook`s pole, Actophotometer)

B) Short experimental (Chemical exercise)

a. Prepare physiological solution for animal experimental Ringer/Tyrode-for one lit

b. Dose calculation- any drug and any dose

02 SHORT- EXPERIMENTAL (ANY ONE)

1. Handling of animals
2. Collection of blood
3. Rabbit eye- M/M/LA
4. Analgesic – Hot Plate/Radiant
5. Oral and IP Administration of drug

03 JOURNAL READING - Critical appraisal of research articles from Journals OR

PROTOCOL WRITING

04 HUMAN EXPERIMENTAL

1. Analgesic drug
2. Drugs affecting Motor-coordination.

OR

CRITICISM OF PROPRIETARY DRUG

OR

THERAPEUTIC PROBLEM

05 Microteaching (any topic from U.G. teaching)

06 Grand Viva (75) & Thesis viva (25)

Total 400 Marks
MODEL QUESTION PAPER
MD (Pharmacology)
Paper-I
Clinical and other Basic Sciences as related to Pharmacology
Max. Marks:100 Time: 3 hrs

• Attempt ALL questions
• Answer each question & its parts in SEQUENTIAL ORDER
• ALL questions carry equal marks
• Illustrate your answer with SUITABLE DIAGRAMS

(i) Discuss briefly the status of hormone replacement therapy in post menopausal women.
(ii) Describe the clinical significance of apoptosis. Discuss the mechanism of action of drugs modifying apoptosis.
(iii) Discuss the management of nosocomial infections.
(iv) Describe the composition of blood substitutes and explain their therapeutic uses.
(v) Outline the present status of purinergic receptors.
(vi) Describe the pharmacotherapy of obesity.
(vii) Define antimicrobial resistance and discuss methods for its prevention.
(viii) Elaborate the modern approaches to receptor characterization and classification.
(ix) Discuss the current approaches in the management of osteoporosis.
(x) Discuss briefly the pathophysiological basis of the management of essential hypertension with the help of suitable illustrations.

MODEL QUESTION PAPER
MD (Pharmacology)
Paper-II
General & Systemic Pharmacology
Max. Marks:100 Time: 3 hrs

• Attempt ALL questions
• Answer each question & its parts in SEQUENTIAL ORDER
• ALL questions carry equal marks
• Illustrate your answer with SUITABLE DIAGRAMS

(i) Give an account of the drugs modifying the Renin-angiotensin system. Discuss the clinical implications with special reference to cardiovascular system.
(ii) Explain the cell-cycle. Discuss the clinical implications of the drugs acting on different phases of cell-cycle.
(iii) Define selective estrogen receptor modulators. Discuss their therapeutic implications.
(iv) Discuss the current therapeutic status of metronidazole in different diseases.
(v) Enumerate newer antiepileptic drugs. Discuss their current therapeutic status in seizure and non-seizure disorders.
(vi) Classify antidepressant drugs. Give an account of adverse effects of typical and atypical antidepressants.
(vii) Discuss the principles of safe and effective antibacterial drug therapy.
(viii) Define half life of a drug following first order kinetics. Discuss its derivation and clinical importance.
(ix) Define therapeutic index and discuss its importance in therapeutics.
(x) Define pA2 value. Describe the method of its calculation giving suitable examples.
MODEL QUESTION PAPER

MD (Pharmacology)

Paper-III

Experimental & Clinical Pharmacology

Max. Marks:100 Time: 3 hrs

• Attempt ALL questions
• Answer each question & its parts in SEQUENTIAL ORDER
• ALL questions carry equal marks
• Illustrate your answer with SUITABLE DIAGRAMS

(i) Define placebo. Give an outline of ethical considerations for its use in clinical trials.

(ii) Explain the role of genetic engineering in new drug development.

(iii) Define LD$_{50}$ and ED$_{50}$. Discuss the methods for their calculation.

(iv) What is the significance of sample size in biomedical research? Give the methods to calculate sample size using an appropriate hypothetical example.

(v) Define the term ‘transgenic animals’. Elaborate on their use in drug research.

(vi) Enumerate the drug schedules. Give a detailed account of Schedule Y.

(vii) Discuss the significance of randomization in clinical trials. Elaborate on the practicable methods of randomization.

(viii) Outline the evaluation of diuretic activity of a new compound in animal models.

(ix) Discuss the phases of clinical trials. Give an outline of Phase V clinical trial plan.

(x) Outline the evaluation of a lead compound for its hypolipidemic activity in animal models.
MODEL QUESTION PAPER
MD (Pharmacology)
Paper-IV
Recent Advances in Pharmacology
Max. Marks: 100 Time: 3 hrs

• Attempt ALL questions
• Answer each question & its parts in SEQUENTIAL ORDER
• ALL questions carry equal marks

Illustrate your answer with SUITABLE DIAGRAMS
(i) Discuss the recent advances in CRIE (Chemotherapy and Radiation Induced Emesis)
(ii) Define monoclonal antibodies. Describe the rationale for their use in therapeutics.
(iii) Give an outline of the pathophysiology of bronchial asthma. Discuss the recent advances in its management.
(iv) Compare the cyclo-oxygenase enzymes. Discuss the current status of COX-2 inhibitors in therapy.
(v) Give an account of pharmacotherapy of cutaneous leishmaniasis.
(vi) Describe the ethical considerations for the use of animals in biomedical research. Discuss the alternatives to animal species in research.
(vii) Discuss the recent advances in the management of type 2 diabetes mellitus.
(viii) Give a diagrammatic representation of the synthesis of eicosanoids. Describe the newer therapeutic applications of prostaglandins:
(ix) Outline the pathophysiology of osteoporosis. Discuss the diagnostic and therapeutic advances in the management of osteoporosis.
(x) Describe the management of Premenstrual Dysphoric Disorder.

Suggested Books & Journals
Core books
Title of Book Author
• Goodman & Gilman’s The Pharmacological Basis of Therapeutics Goodman and Gilman
• Basic and Clinical Pharmacology BG Katzung
• Pharmacology Rang, Dale, Ritter and Moore

Reference books
• Applied Therapeutics Kimble, Young, Corelli and Alldredge
• Basic Statistical Methods Downie and Heath
• Clinical Pharmacology Bennett and Brown
• Fundamentals of Experimental Pharmacology Ghosh M.N.
• Principles of Pharmacology Paul L Munson
• Screening Methods Vogel and Vogel
• Text books of Pharmacology Bowman and Rand

Monographs
• Martin Dale’s Extra Pharmacopoeia
• Other Pharmacopoeias
Journals:
- Annual Review of Pharmacology and Toxicology
- British Journal of Pharmacology
- British Medical Journal
- Drugs
- European Journal of Clinical Pharmacology
- Indian Journal of Pharmacology
- Japanese Journal of Clinical Pharmacology
- Journal of Anesthesiology and Clinical Pharmacology
- Journal of Association of Physicians of India
- The Lancet
- The New England Journal of Medicine
- Trends in Pharmacological Sciences

Log book write-ups:
(To be filled by student as provided in the format)
1) Main purpose of the log book should be to document the work done (Experimentations, journals, thesis work, seminars, workshops etc)
2) The content of the log book work to be signed ONLY by the Guide/ PG teaching in charge /HOD.

Journal/ seminar presentations in department:
It should be taken care that each student presents 10 -12 seminars during the entire tenure and topics could be divided as per the following format

Year Topics
1st General pharmacology (2) Systemic pharmacology (2)
2nd Systemic/clinical /experimental pharmacology (4)
3rd Recent pharmacology (4)

- Evaluation of the journal /seminar should be done by teachers on 5 points. Eg presentation, completeness, A-V aids use, understanding, overall performance. The purpose of this exercise should be to make the student aware of his progress.
- Experimental evaluation system (to be evaluated by guide, signed and pasted in the log book)

Example of evaluation sheet format given below.

Headings | Comments
---|---
Assembly | Excellent Good Fair Poor
Cleanliness | 
Instruments used | 
Technique | 
Results/interpretation | 
Discussion: Theory | 
Discussion: Practical | 
Overall remarks | 

LOGBOOK

(FORMAT)

RESIDENCY PROGRAMME

M.D.(PHARmacology AND THERAPEUTICS)

D. Y. Patil University, Kolhapur
PERSONAL BIODATA

NAME OF THE CANDIDATE –

DATE OF BIRTH OF THE CANDIDATE –

NAME OF THE INSTITUTE –

YEAR AND ONTH OF REGISTRATION –

NAME OF THE P.G.TEACHER –

FATHER’S NAME –

PERMANENT ADDRESS OF THE CANDIDATE –

Passport Size Photograph
### EDUCATION QUALIFICATIONS

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### SERVICE RECORD

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### DISSERTATION DETAILS

- NAME OF THE TOPIC –

- CO-GUIDE IF ANY –

- DATE OF CLEARANCE BY ETHICS COMMITTEE –
### POSITING SCHEDULES

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### JOURNAL CLUBS

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### SHORT TALKS/SEMINARS CONDUCTED BY THE CANDIDATE

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### EXPERIMENTS CONDUCTED BY THE CANDIDATE

[GRAPH IF ANY TO BE PRESERVED]

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THIS SHOULD INCLUDE CLINICAL PHARMACOLOGY EXPERIMENTS, CHEMICAL EXPERIMENTS and COMPUTER ASSISTED EXPERIMENTS.
USE ADDITIONAL SHEETS IF REQUIRED.

CONFERENCES/WORKSHOPS ATTENDED
1.

2.

3.

4.

5.

PUBLICATIONS IF ANY
1.

2.

3.

4.

SIGN. OF GUIDE

SIGN. OF HOD