REGULATIONS AND CURRICULUM GOVERNING

M.Sc. MEDICAL PHARMACOLOGY PROGRAM

(2024-25)

Name of the Constituent Unit/Centre: Yenepoya Medical College



YENEPOYA
Deemed to be University

Deralakatte, Mangalore, Karnataka.

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NOTIFICATION FROM THE UNIVERSITY

YENEPOYA
UNIVERSITY

Office of the Registrar
University Road
P.O. Nithyananda Nagar
Deralakatte
Mangalore - 575018
Ph:0824-2204667/68/69/71
Fax: 0824-2203943

Ref: No. YU/REG/ACA/3-ACM/2009 31.10.2009

NOTIFICATION

Sub: Starting of M.Sc. in pre & para clinical departments

Ref: Resolution of the Academic Council at its 3rd meeting held on 31.10.2009 vide agenda - 3

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The Academic Council at its 3rd meeting and subsequently the Board of Management at its 9th meeting held on 31.10.2009 have resolved to approve the proposal to start following M.Sc. in pre & para clinical departments:-

1. M.Sc Medical Anatomy
2. M.Sc Medical Physiology
3. M.Sc Medical Biochemistry
4. M.Sc Medical Pharmacology
5. M.Sc Medical Microbiology

This notification is issued for implementation with effect from the academic year 2010-2011.

I/c REGISTRAR
Registrar
YENEPOYA
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To:

The Principal - YMC

Copy to:

1. Controller of Examinations
2. File copy

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M.SC MEDICAL PHARMACOLOGY COURSES

Goals: To be a good Academician and Researcher in Pharmacology

Objectives :

1. To gain knowledge in Medical Pharmacology namely in the field of Pharmacokinetic / Pharmacodynamic / Clinical pharmacology [Pre Clinical and Clinical trial], Adverse drug reactions and Drug information services.
2. At the end of the course He/She should be able to teach undergraduate students of Medical /Dental/Physiotherapy and Nursing, **principles of pharmacology**.
3. To conduct pre clinical trials and undertake research projects

Criteria for admission: The Candidates must have passed B.Sc with 50% marks and with one subject of biological sciences or BAMS or BHMS or BPT or BPHARM or any other professional graduates from a recognized university of our country.

Duration of course: A 3 year course. 1st year preliminary Basic Medical Sciences like Human Anatomy, Human Physiology & Biochemistry would be taught.

Final MSc (2 years) - Medical Pharmacology would be studied by the student.

6. Course content:

i. Sections:

1. Introduction and Historical background of Pharmacology
2. General Pharmacology
3. Drugs Acting on Autonomic Nervous System
4. Autacoids and Related Drugs
5. Respiratory System Drugs
6. Hormones and Related Drugs

7. Drugs Affecting Blood and Blood Formation
8. Drugs Acting on Kidney
9. Drugs Acting on Cardiovascular System
10. Gastrointenstinal Drugs
11. Drugs Acting on Central Nervous System
12. Antimicrobial Chemotherapy
13. Parasite Chemotherapy
14. Cancer Chemotherapy
15. Immunopharmacology
16. Toxicology
17. Drugs in Preganancy and Pediatrics
18. Geriatric Pharmacology
19. Dermatological Pharmacology
20. Ophthalmic Pharmacology
21. Dental Pharmacology
22. The Vitamins
23. Study tour

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Topic in each section with name:

1. Introduction and Historical background of Pharmacology 1 hr.

2. General Pharmacology 20 hrs

Introduction, Drug Delivery Systems, Routes of Drug Administration, Pharmacodynamics, Pharmacokinetics, Drug Interactions, Adverse Drug, Reactions, Drug Development, Gene-Based therapy

3. Drugs Acting on Autonomic Nervous System 10 hrs

General Consideration, Parasympathomimetics, Anticholinergic Agents, Sympathomimetics, Adrenoceptor Blocking Drugs, Skeletal Muscle Relaxants

4. Autocoids and Related Drugs 5 hrs

Introduction, Histamine and Antihistaminic Drugs, 5-Hydroxytryptamine Receptor, Agonists and Antagonists, Renin-Angiotensin system and Kinins, Eicosanoids and Platelet Activating Factor, Analgesics, Antipyretics and Antiinflammatory

Drugs: Drugs for the Treatment of Rheumatoid Arthritis and gout

5. Respiratory System Drugs 5 hrs

Pharmacotherapy of Cough, Pharmacotherapy of Bronchial Asthma

6. Hormones and Related Drugs 10 hrs

Introduction, Thyroid and Antithyroid Drugs, Pancreatic Hormones and Antidiabetic Drugs, Adrenocortical Steroids and their synthetic Analogs, Female Hormones, Male Hormones, Oxytoxics and Uterine Relaxants

7. Drugs Affecting Blood and Blood Formation 5 hrs

Hematinics, Coagulants, Anticoagulants, Thrombolytic and Antiplatelet Drugs

8. Drugs Acting on Kidney 2 hrs

Diuretics

9. Drugs Acting on Cardiovascular System **10 hrs**

Drug Therapy of Heart Failure, Calcium Channel Blockers, Potassium Channel Openers, Drugs for Myocardial Ischemia, Antihypertensive Drugs and the Drug therapy for Hypertension, Drug therapy of shock, Lipid Lowering drugs.

10. Gastrointenstinal Drugs **5 hrs**

Drug Therapy of Peptic Ulcer, Emetics and Antiemetics. Drugs Affecting Gastrointestinal Motility

11. Drugs Acting on Central Nervous System **10 hrs**

Introduction, General Anesthetics, Local Anesthetics, Therapeutic Gases, Alcohol, Antiepileptic Drugs, Drugs Effective in the Therapy of parkinson's Disease, Anxiolytic and Hypnotic Drugs, Drug Therapy of Affective Disorders, Antipsychotic Agents, Psychostimulants and Psychedelic Agents, Nootropic Agents, Opioid Analgesics and Antagonists, Substance abuse and Dependence, Central Nervous System Stimulants

12. Antimicrobial Chemotherapy **10 hrs**

General Principles of Antimicrobial Action, Sulphonamides, Trimethoprim-sulphonamide, Quinolones and Agents, used for urinary tract infection, Penicillin, Cephalosporines and other B-Lactam antibiotics, Tetracyclines, Chloramphenicol, Aminoglycosides, Macrolide and Miscellaneous Antimicrobials, Antituberculosis Drugs, Chemotherapy of Leprosy, Antifungal Drugs, Antiviral Drugs, Antiseptics and Disinfectants

13. Parasite Chemotherapy **2 hrs**

Introduction, Antimalarial Drugs, Drugs used in the Treatment of Amebiasis, Giardiasis and Trichomoniasis, Anthelmintic Drugs.

14. Cancer Chemotherapy **2 hrs**

Introduction, Antineplastic Agents

15. Immunopharmacology **2 hrs**

Introduction, Immunomodulators: Immunosuppressive Agents and Immunostimulants

16. Toxicology **3 hrs**

Heavy Metals and Antagonists, General Principles of Treatment of acute Poisonings and Environmetntal and Occupational Toxicology

17. Drugs in Preganancy and Pediatrics **3 hrs**

Drugs in Pregnancy, Drug Therapy in Pediatrics, Vaccines and sera

18. Geriatric Pharmacology **3 hrs**

Drug Therapy in Geriatrics

19. Dermatological Pharmacology **3 hrs**

Drug used in Dermatological Disorders

20. Ophthalmic Pharmacology **3 hrs**

Drug used in the Management of Ophthalmic Diseases

21. Dental Pharmacology **3 hrs**

Commonly Used Drugs in dentistry

22. The Vitamins **3 hrs**

Vitamins

*** 23. Postings**

One month postings in Yenepoya Research Center.

****- Indicates curriculum amended in 31st Academic Council Meeting.***

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Details of distribution of topics in each paper will be as follows:

Paper 1: General Pharmacology including Biostatistics

- Sources of drugs, Dosage forms, Special drug delivery system, Route of administration, Pharmacokinetics- Absorption, Distribution, Metabolism, Excretion, Pharmacodynamic- Mechanism of drug action, Combination of drugs and their effects
- Adverse drug reaction, Drug interaction, Factors modifying drug action, Dose
- Biostatistics- Meta-analysis, ANOVA, T-test, Randomization, P Value, Chi square test, Standard error & deviation

Paper 2: Clinical Pharmacology

- Clinical pharmacology- BA, BE studies, TDM, HPLC, Pharmacovigilance, Pharmacogenetics, Pharmaco-epidemiology, Pharmaco-economics, P-drugs, Essential drugs, Gene therapy, stem cell therapy, Drug shelf life
- Preclinical studies, Clinical trials- Placebo, Micro-dosing, Package insert
- Regulatory bodies- FDA, IAEC/CPCSEA, Human ethics committee, Drug schedules.
- Experimental pharmacology- Bioassay, Dose response curve, Radioimmunoassay
- Drug screening method- Analgesics, Anti-inflammatory, Anti epileptic, Anti depressant, Anxiolytic, Antihypertensive, Anti-diabetic, Anti-asthamatic, Local anaesthetic, Antiemetic, Anti-anginal, Peptic ulcer.

Paper 3: Systemic Pharmacology

- ANS, CVS, Diuretics, Blood, CNS, Autacoids, RS.
- Drug acting on uterus, GIT, Endocrine, Immune Pharmacology, Gout, RA, Vaccine, Vitamins – antioxidants, Enzymes
- Antibacterial, Antifungal, Antiviral, Cancer chemotherapy, Therapeutic gases- hyperbaric oxygen, Antiseptics & Disinfectants
- Drugs used in extreme ages-Paediatric, geriatric, Drugs used in pregnancy & lactation.
- Ocular pharmacology, Drugs used in Dermatology.
- Toxicology- Heavy metal poisoning, animal bites, Hepato toxic drugs, Nephro toxic drugs.

Questions related to recent advances in pharmacology will asked in any of the three papers

ii. Practical

List of experiments Pharmacology

I. Experimental Pharmacology

Discussion of the following

1. Bioassay- Bracketing, three point assay
2. Graphs- Effect of drugs on isolated frog heart (2)

   Effect of drugs on frog rectus abdominus muscle (2)

   Effect of drugs on dog's BP (3)

   Rabbit eye experiments (3)

Animal handling and technique demonstration

Instrument handling

II. Clinical Pharmacology

Chemical test

Journal article criticism

Promotional literature criticism

Project presentation

*Computer assisted learning (CAL) modules for experimental pharmacology.

- Indicates curriculum amended in 31st Academic Council Meeting.

Screening methods for

i. Antiepileptic drugs
ii. Anti ulcer drugs
iii. Anti inflammatory drugs
iv. Analgesics
v. Anti anxiety drugs
vi. Anti depressant drugs
vii. Principles in Biostatic

viii. Principles in preclinical screening of drugs

ix. Principles in Research methodology

A short Research project to be undertaken during their course

Clinical Pharmacology

i. *ADR reporting, Prescription auditing exercises.

- Indicates curriculum amended in 31st Academic Council Meeting

Teaching hours:

Scheme of teaching:

i. Total no. hours: Lecturers – 120 hrs [60 hrs / year]

Tutorials - 10

Seminars – 10

ii. Practical / Demonstrations – 10

iii. Tests after completion of each section of lectures

Theory Viva voce

3 Internal Assessments would be conducted 2 in the Final year MSc

Revision classes – 10

iv. Research project – 1

8. Scheme of Examination:

Internal Assessment examination:

Total Marks: Theory- 100 marks + Practical-50 marks

Number of Internal Assessment exams to be conducted:

Theory: (3) Final year MSc

Practical: (3) Final year MSc

	Portions	Theory	Practical
I Internal exam	General Pharmacology, ANS, CVS and Diuretics	100	50
II Internal exam	CNS, Blood, Autacoids, RS, GIT	100	50
III Internal exam	Hormones, Chemotherapy	100	50

University examination

Eligibility- A minimum of average 40% marks in internal assessment is mandatory for appearing in the university exam.

a. Theory:

Question paper pattern: 3 papers 100 mark each paper.

Total Marks: 300.

[Passing marks 50% of total ie; 150/300]

Internal assessment- 25 marks

b. Practical examination:

Exercises in practical exams:

Bio Assay : 20 marks

Graph : 10 marks

Animal Handling : 10 marks

Instrument : 10 marks

Chemical test : 10 marks

Journal article criticism : 10 marks

ADR Reporting : 10 marks

Research project : 20 marks

Total marks : 100 marks

Internal assessment – 25 marks

c. Viva voce: 50 marks.

d. Examiners: No. of external examiner : 2

No. of Internal examiner: 2

e. **Examination days:** 2 days.

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List of recommended test books (Latest editions)

1	Principles of Pharmacology, HL Sharma and K.K. Sharma
2	Pharmacology and Pharmacotherapeutics, by R.S. Satoskar and others
3	Essentials of Medical Pharmacology by K.D. Tripathi
4	Practical manual of Experimental and Clinical Pharmacology by Bikash Medhi, Ajay Prakash
5	Basic and clinical Pharmacology, by Bertra m G. Katzung,
6	Fundamentals of experimental Pharmacology, by Ghosh M.N.
8	Handbook of Experimental Pharmacology, by S.K. Kulkarni
9	Evaluation of drug activities and Pharmacometrics, by D.R. Laurence and A.L. Bacharach, Vol. 1 & 2
10	Brody's Human Pharmacology, by Brody

10. List of recommended reference books (Latest editions)

1. The Pharmacological basis of therapeutics, by Good Man and Gill Man,
2. Martindale. The complete drug reference Vol. I & II.
3. The MERCK INDEX
4. Remington. The science and practice of Pharmacy – Vol. I & II.

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Blue print for MSc Pharmacology theory question papers

Paper 1 (General Pharmacology including Bio-statistics)

Sl. No.	Section/Topics	Weightage	Marks allotted	No. of Questions
1	Sources of drugs, Dosage forms, Special drug delivery system, Route of administration	20%	20	2
2	Pharmacokinetics- Absorption, Distribution, Metabolism, Excretion	30%	30	2
3	Pharmacodynamic- Mechanism of drug action, Combination of drugs and their effects	30%	30	2
4	Adverse drug reaction, Drug interaction, Factors modifying drug action, Dose	10%	10	1
5	Biostatistics- Meta-analysis, ANOVA, T-test, Randomization, P Value, Chi square test, Standard error & deviation	10%	10	1

Paper 2 (Clinical Pharmacology)

Sl. No.	Section/Topics	Weightage	Marks allotted	No. of Questions
1	Clinical pharmacology- BA, BE studies, TDM, HPLC, Pharmacovigilance,	30%	30	2

	Pharmacogenetics, Pharmaco-epidemiology, Pharmaco-economics, P-drugs, Essential drugs, Gene therapy, stem cell therapy, Drug shelf life			
2	Preclinical studies, Clinical trials-Placebo, Micro-dosing, Package insert	30%	30	2
3	Regulatory bodies- FDA, IAEC/CCSEA, Human ethics committee, Drug schedules.	10%	10	1
4	Experimental pharmacology-Bioassay, Dose response curve, Radioimmunoassay	10%	10	1
5	Drug screening method-Analgesics, Anti-inflammatory, Anti epileptic, Anti depressant, Anxiolytic, Antihypertensive, Anti-diabetic, Anti-asthamatic, Local anaesthetic, Antiemetic, Anti-anginal, Peptic ulcer.	20%	20	2

Paper 3 (Systemic Pharmacology)

Sl. No.	Section/Topics	Weightage	Marks allotted	No. of Questions
1	ANS, CVS, Diuretics, Blood, CNS, Autacoids, RS.	30%	30	2
2	Drug acting on uterus, GIT, Endocrine, Immune Pharmacology, Gout, RA,	20%	20	2

	Vaccine, Vitamins – antioxidants, Enzymes			
3	Antibacterial, Antifungal, Antiviral, Cancer chemotherapy, Therapeutic gases- hyperbaric oxygen, Antiseptics & Disinfectants	30%	30	2
4	Drugs used in extreme ages-Paediatric, geriatric, Drugs used in pregnancy & lactation. Ocular pharmacology, Drugs used in Dermatology.	10%	10	1
5	Toxicology- Heavy metal poisoning, animal bites, Hepato toxic drugs, Nephro toxic drugs.	10%	10	1

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MODEL QUESTION PAPERS

MSc Medical pharmacology

Paper 1

Time: 3 Hours **[Max. Marks: 100]**

LONG ASSAYS **(2X20= 40 Marks)**

1. Define biotransformation. Discuss the different phases of biotransformation with suitable examples for each.
2. Discuss the various factors modifying drug action with suitable examples for each.

SHORT ASSAYS **(6x10= 60 Marks)**

3. Sources of drugs with examples
4. ANOVA and post-hoc tests
5. Transdermal therapeutic system
6. Drug antagonism
7. Explain G-protein coupled receptor mediated drug action with examples.
8. Drug allergy

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MSc Medical pharmacology

Paper II

Time: 3 Hours **[Max. Marks: 100]**

LONG ASSAYS **(2X20= 40 Marks)**

1. Explain the phases of clinical trials
2. Discuss about Pharmacovigilance Programme of India. Write a note on causality assessment

SHORT ASSAYS **(6X10= 60 Marks)**

3. Describe different types of Bioassay
4. Therapeutic drug monitoring
5. Rat as an experimental animal
6. Institutional Animal Ethics Committee
7. Explain the screening methods for analgesic activity
8. Explain the screening methods for anti epileptic activity

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MSc Medical pharmacology

Paper 3

Time: 3 Hours **[Max. Marks: 100]**

LONG ASSAYS **(2X20= 40 Marks)**

1. Classify beta blockers. Explain the therapeutic uses and adverse effects of beta blockers.
2. Classify antimalarial drugs. Explain the mechanism of action & adverse effects of chloroquine.

SHORT ASSAYS **(6X10= 10 Marks)**

3. Aminoglycoside antibiotics-Enlist their common properties and explain mechanism of action and adverse effects.
4. Insulin analogues
5. Classify drugs used in peptic ulcer disease. Explain the mechanism of action and adverse effects proton pump inhibitors.
6. Selective serotonin reuptake inhibitors
7. Drugs used in treatment of acne vulgaris.
8. Dimercaprol

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DEPARTMENT OF PHARMACOLOGY

YENEPOYA MEDICAL COLLEGE

MANGALORE

YENEPOYA (Deemed to be University)
(Recognised under section 3(A) of the UGC Act 1956)

POSTGRADUATES LOG BOOK



POSTGRADUATE LOG BOOK OF

.....

FOR THE DEGREE IN MASTER OF SCIENCE IN

MEDICAL PHARMACOLOGY

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CERTIFICATE

POSTGRADUATE LOG BOOK

Certified that this is the bonafide record of work done by _____, Post-Graduate student of Pharmacology during the period of _____.

Place:

Date:

Professor and Head

Department of Pharmacology

Yenepoya Medical College

Mangalore- 575018

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BIO-DATA OF CANDIDATE	
Name in full	
Date of birth	
Degree held & year in which obtained	
Name of the College & University	
Date of joining	
Course joined	
Blood Group	
Permanent Address	
Postal Address	
Telephone No.	
Email id	

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Seminars presented

Sl No.	Date	Topic	Faculty Signature

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JOURNAL ARTICLE PRESENTED

Sl. No	Date	Article title with Journal name	Moderators signature

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DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

JOURNAL ARTICLE ATTENDED

Sl. No.	Date	Article title with Journal name	Presented by	Signature

Sl. No.	Date	Article title with Journal name	Presented by	Signature

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DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

LECTURES

Sl. No	Date	Topic	Faculty name	Signature

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Lab work (Simulation, Experiments done, etc)

Sl. No	Date	Topic	Faculty name	Signature

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POSTING

Date of Joining _____

Sl No.	Date	Work done	Remarks

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CONFERENCE/WORKSHOP/CME/GUEST LECTURES ATTENDED

Sl No.	Date	Topic/Title	Venue

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II. DETAILS OF RESEARCH ACTIVITY

1. DISSERTATION DETAILS

Title of the project:

Details of the Guide:

Date of Ethical clearance:

Date of submission to the University:

Any other details:

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II. DETAILS OF RESEARCH ACTIVITY

2. Oral/Poster presentations

Sl. No	Date	Presentation details	Venue

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3. Publications & Research projects

1.

2.

3.

4.

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III. DETAILS OF CASE DISCUSSION

Case discussions (ADR)

Sl. No	Date	Topic	Presented by	Sign

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IV. MISCELLANEOUS

Sl. No	Date	Particulars	Remarks

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V. SUMMARY

Name : .....

Degree: M.Sc. Pharmacology

From: ..... To: .....

No. of Seminars presented	
No. of Journal Clubs presented	
No. of P.G. Discussion participated	
No of conferences/ CMEs/ workshops attended	
Title of Dissertation	
Oral presentation	
Poster presentation	
Publication	