

# SUMANDEEP VIDYAPEETH

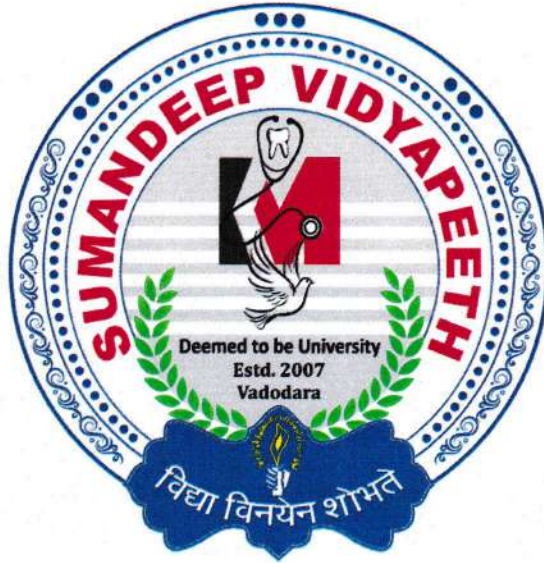
(Declared as Deemed to be University under Section 3 of the UGC Act 1956)

Accredited by NAAC with a CGPA of 3.53 out of four-point scale at 'A' Grade

At & Post Piparia, Tal: Waghodia 391760 (Gujarat) India.

Ph: 02668-245262/64/66, Telefax: 02668-245126,

Website: www.sumandeepvidyapeethdu.edu.in



## CURRICULUM

### Master of Science (M.Sc) MEDICAL PHARMACOLOGY

Attested CTC

*Sharaney*  
15/2/2021

Vice-Chancellor

Sumandeep Vidyapeeth  
An Institution Deemed to be University  
VIII, Piparia, Taluka: Waghodia.  
Dist. Vadodara-391 760. (Gujarat)

2015

*Manchanda*

*G. Shah*



## Course of M. Sc. (Medical) Pharmacology

### **PROGRAMME OUTCOME : M.SC. MEDICAL**

The Master of Science in Medical field provides the candidate with knowledge, general competence, and analytical skills on an advanced level, needed in consultancy, education, research.

### **Programme specific outcome : M.SC. MEDICAL**

**POS 1.** A post graduate student after undergoing the required training should be able to deal with the allied departments and render services in advanced laboratory investigations.

**POS 2.** The PG student should acquire basic skills in teaching medical/para-medical students

**POS 3.** The student should have knowledge about the principles of research methodology and self-directed learning for continuous professional development.

**POS 4.** The student should be able to carry out a research project from planning to publication and be able to pursue academic interests.

**COURSE OUTCOME (CO) :**At the end of the M.Sc. training programme in Pharmacology, the student should acquire competencies in the following areas:

1. The student should be able to explain clearly concepts and principles of Pharmacology and therapeutics.
2. The student should also be able to explain the drug development processes. S/he should be able to explain Drugs and Cosmetics Act, in addition to clinical trial procedures.
3. The student should be able to effectively teach undergraduate students in medicine (MBBS) and allied health science courses (Dentistry and Nursing) so they become competent healthcare professionals and able to contribute to training of postgraduate trainees.
4. The student should be able to carry out a research project (both basic and clinical) from planning to publication and be able to pursue academic interests and continue life-long learning to become more experienced in all the above areas and to eventually be able to guide postgraduates in their thesis work.

**I. Aim/Goal:**At the end of three and half years course, M. Sc. Candidate must know Pharmacology subject thoroughly both in theory and practical aspects

### **II. Course objectives-**

- To train competent pharmacologists to work as medical teachers and / research scientist.
- Who will be aware of advances and development in the field of pharmacology and allied disciplines



- Who will acquire the spirit of scientific enquiry and be oriented to principles of research methodology
- Who will acquire the basic skills in teaching of the medical and paramedical students

### III. Duration of the course:

Three and a half year, will consist of-

M. Sc. (Medical) Part – I – one year

M. Sc. (Medical Pharmacology) Part –II – two years after passing Part I

## M. SC. (MEDICAL) PART I

**Aim** of M Sc Medical Part I course is to impart basic knowledge of all preclinical & para clinical subjects including Anatomy, Physiology, Biochemistry, Pathology, Microbiology and Pharmacology in the form of theory lectures.

### TEACHING PROGRAM (CURRICULUM)

#### Pharmacology

##### **General pharmacology -**

- Definitions
- Routes of administration
- Pharmacokinetics; pharmacodynamics
- Adverse drug reactions
- Gestational, paediatric and geriatric pharmacology

##### **Autonomic nervous system -**

- Introduction- Neurohumoral transmission
- Adrenergic system- Adrenergic & anti adrenergic drugs
- Cholinergic system- Cholinergic & anti cholinergic drugs

##### **Autacoids & related inflammatory disorders–**

- Histamine & antihistaminics, bradykinin & antagonists
- 5-HT & antagonists, angiotensin & antagonists
- Eicosanoids & other mediators of inflammation
- Non steroidal anti inflammatory drugs
- Drugs used in gout & arthritides
- Drugs used in asthma & cough

##### **Cardiovascular (including renal) system –**

- Diuretics
- Anti hypertensive drugs
- Drugs used in ischemic heart disease
- Drugs used in CHF
- Anti arrhythmic drugs
- Hypolipidemic drugs



### **Central nervous system-**

- Introduction- excitatory & inhibitory neurotransmitters
- Sedative-hypnotics
- Antiepileptics
- Opioids
- Anaesthetics- general & local
- Psychotropic drugs
- Alcohols
- Drugs used in degenerative disorders

### **Drugs affecting blood & blood forming organs-**

- Coagulants, anticoagulants, anti platelet & thrombolytic agents
- Drugs used in treatment of anemia

### **Hormones –**

- Anterior and posterior pituitary hormones
- Thyroid hormones and anti thyroid drugs
- Insulin and oral anti diabetic agents
- Corticosteroids
- Sex hormones and their antagonists, pro fertility & anti fertility agents
- Drugs affecting calcium metabolism
- Drugs acting on uterus- stimulants & relaxants

### **Gastrointestinal system –**

- Drugs used in the treatment of constipation and diarrhea
- Antiemetics
- Drugs used in the treatment of acid peptic disorders

### **Antimicrobials and chemotherapeutic agents**

- General principles
- Drugs used in bacterial, fungal, viral & protozoal infections, anthelmintics
- Anti cancer agents

### **Pharmacogenetics, genotherapy and immuno pharmacology**

## **M. Sc. Part – I:**

### **Scheme of Examination:**

The examination is by theory papers only, No practicals.

### **Internal Examinations-**

Two Internal examinations, one each at the end of first & second term respectively, of 30 marks each

One preliminary examination 4 weeks prior to commencement of University examination consisting of full course and of .70 marks

Internal Credit marks - 30



### **University examination-**

At the end of 3<sup>rd</sup> term, examination will be conducted by university of 70 marks and 30 marks added from internal assessment

### **Criteria for passing:**

To pass the examination, a candidate is required to obtain minimum 50% of marks in each paper.

## **PHARMACOLOGY- M. Sc. (MEDICAL) PART II**

### **DURATION OF COURSE-**

Two Years after passing M.Sc. (Medical) Part I

### **Course Objectives-**

#### **Preamble-**

The purpose of M.Sc. (Medical) Pharmacology Part II program at this university is to train science graduates to develop into medical pharmacologists & bridge the gap between demand & supply of qualified medical pharmacologists both in academia & pharmaceutical industry. The role of these experts will be different from, though complimentary to, medical graduates with M.D. Pharmacology. Obviously, therefore, the training inputs for this program are somewhat different from the ones prescribed for M. D. in Pharmacology where the approach to the subject is largely clinically oriented.

#### **Broad objectives:-**

Candidates upon successfully qualifying in the M.Sc.( Medical) Pharmacology examination will be able to-

1. Teach pharmacology to students of medical & allied disciplines.
2. Independently plan & undertake basic research related to drugs and communicate the findings in conferences/ journals.
3. Plan & conduct preclinical research & toxicity studies.
4. Supervise breeding & upkeep of laboratory animals.
5. Able to retrieve scientific information for activities in a pharmaceutical house.

#### **Learning objectives-**

1. Demonstrate sound knowledge of general pharmacological principles, systemic pharmacology and rational use of drugs.
2. Plan & conduct lecture, demonstration, practical and tutorial classes for students of medical and allied disciplines.
3. Understand the principles of essential drugs concept including rational use of drugs.
4. Carry out screening of drugs for pharmacological & toxicological profile.
5. Carry out drug related literature search, formulate research project & undertake the same. Apply appropriate statistical methods for summarizing & analyzing data.





6. Present research findings in conferences (oral / poster sessions), communicate research/ educational papers in peer reviewed journals, critically review and comment on research papers.
7. Measure drug levels in blood & other biological fluids using suitable chemical assay methods & interpret the same in therapeutic/ toxicological context.
8. Monitor adverse drug reactions & provide drug information service to doctors / public.
9. Use computer & IT tools for teaching, research & presentation / publication of data.
10. Demonstrate knowledge of drug rules & regulations existing in the country.

### **Post graduate training-**

Active learning process by the post graduate students will be the mainstay of the training. This will involve structured lectures, seminars, symposia, group discussions, journal club meetings etc. They will also actively participate in teaching UG students from time to time in relevant areas.

### **Learning Program-**

To achieve the above objectives in 2 yrs following structured program is proposed-

#### **Semester I –**

- Orientation to the department
- Choosing the subject of dissertation & guide
- Synopsis of dissertation including research design
- Recapitulate the subject- attending pharmacology lectures with MBBS students

#### **Semester II-**

- Learning theory by attending UG & PG classes
- Practicals- UG practicals & PG experiments
- Dissertation work

#### **Semester III-**

- Learning theory by attending UG & PG classes
- Practicals- UG practicals & PG experiments
- Dissertation work

#### **Semester IV-**

- Learning theory by attending UG & PG classes
- Practicals- UG practicals & PG experiments
- Submission of Dissertation

### **Syllabus:**

#### **I. General pharmacology:**

- Definition and scope of pharmacology and its relation to other subjects and branches of biology.
- Study of the relations of the living material to the pharmacological agents.
- Pharmacokinetics- Principles and application
- Pharmacodynamics- Principles and application



- Adverse drug reaction & Pharmacovigilance
- Factors influencing drug actions
- Preclinical drug evaluation and clinical trials

## **II. Special and systemic pharmacology**

### **Autonomic nervous system -**

- Introduction- Neurohumoral transmission
- Adrenergic system- Adrenergic & anti adrenergic drugs
- Cholinergic system- Cholinergic & anti cholinergic drugs

### **Autacoids & related inflammatory disorders–**

- Histamine & antihistaminics, bradykinin & antagonists
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- Eicosanoids & other mediators of inflammation
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### **Cardiovascular (including renal) system –**

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### **Central nervous system-**

- Introduction- Excitatory & inhibitory neurotransmitters
- Sedative-hypnotics
- Antiepileptics
- Opioids
- Anaesthetics- General & local
- Psychotropic drugs
- Alcohols
- Drugs used in degenerative disorders

### **Drugs affecting blood & blood forming organs-**

- Coagulants, anticoagulants, anti platelet & thrombolytic agents
- Drugs used in treatment of anemia

### **Hormones & hormone antagonists–**

- Anterior and posterior pituitary hormones
- Thyroid hormones and anti thyroid drugs
- Insulin and oral anti diabetic agents
- Corticosteroids
- Sex hormones, their antagonists, pro fertility & anti fertility agents
- Drugs affecting calcium metabolism
- Drugs acting on uterus- Stimulants & relaxants

### **Gastrointestinal system –**

- Drugs therapy of constipation and diarrhea
- Antiemetics
- Drugs used in the treatment of acid-peptic disorders



### **Antimicrobials and chemotherapeutic agents**

- General principles
- Drugs used in bacterial, fungal, viral & protozoal infections, anthelmintics
- Anti cancer agents

### **Pharmacogenetics, genetherapy and immunopharmacology**

Apart from the above topics in Pharmacology the students will have to learn Biostatistics- basic and applied to pharmacology

### **Practicals and orals:**

Learning will involve following component-

A. Theory: By way of-

- a. Attending lectures with UG MBBS students and PG lectures
- b. Seminars, symposia and discussions
- c. Journal club meetings
- d. Assignments

B. Practical by way of carrying out-

- a. Bioassays
- b. In vitro experiments on isolated animal tissues
- c. In vivo experiments in laboratory animals
- d. Toxicological studies
- e. Biochemical estimations

C. Dissertation

The candidate has to carry out research work under the supervision of an eligible faculty member in the department of pharmacology. The work will be approved by the Institutional Human and Animal Ethics Committees and that has to be completed and submitted as prerequisite to appear in final university examination 3 month prior to its commencement..

### **Scheme of Examination-**

#### **University Examination-**

At the end of completion of Part- II:-

#### **1. Theory:**

Three question papers of three hours of 100 marks each. (300 marks)

Paper– I: General pharmacology- Pharmacokinetics, pharmacodynamics, adverse drug reactions, drug interactions, bio-assay& bio-statistics

Paper–II: Systemic pharmacology and evaluation of drugs.

Paper–III: Systemic pharmacology, recent advances and History of pharmacology,





Paper style-

Question 1 & Question 2 - Long essay type questions- 2 x 20 = 40 marks

Question 3 & Question 4- Short essay type questions- 6 x 10 = 60 marks

**2. Practicals:**

300 marks

There will be three exercises:

Long experiment = 100 marks

Short experiment/ Bioassay = 50 marks

Toxicology/chemical testing = 50 marks

Viva voce (including viva on dissertation) = 100 marks

The practicals, orals and dissertation would be of 300 marks. The examination shall last for not less than 2 days and not more than 4 days. The candidate will have 3 exercises, an in situ experiment, a bioassay and a chemical pharmacology experiment. The oral examination will follow the practicals and would include adequate coverage of the subject. It will also cover discussion on the dissertation work done by the candidate.

**Criteria for passing:**

- To pass the examination, a candidate is required to obtain 50% of the aggregate of the marks assigned to theory papers and 50% of the aggregate of the marks assigned to practicals and orals.
- Successful completion and prior acceptance of dissertation

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**Attested CTC**

*Charan*  
15/2/2021

**Vice-Chancellor**

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