RAWALPINDI MEDICAL UNIVERSITY

M.Phil PHARMACOLOGY
Curriculum and Syllabus 2018
Contents

Acknowledgement ........................................................................................................................................... 3
SUPERVISED BY: ........................................................................................................................................... 3
    Mission Statement of RMU ............................................................................................................................. 5
    INTRODUCTION TO THE DEPARTMENT OF PHARMACOLOGY .............................................................. 6
INTRODUCTION TO PROGRAM ......................................................................................................................... 7
    GOALS ......................................................................................................................................................... 7
    OBJECTIVES ............................................................................................................................................. 7
    IN KNOWLEDGE ....................................................................................................................................... 7
    IN SKILLS................................................................................................................................................ 8
    IN ATTITUDES .......................................................................................................................................... 8
RESOURCES .................................................................................................................................................... 9
    INTRODUCTION TO FACULTY .................................................................................................................. 9
    INFRASTRUCTURE ................................................................................................................................. 10
    EQUIPMENTS .......................................................................................................................................... 11
ELIGIBILITY CRITERIA: ................................................................................................................................... 12
COURSES OUTLINE ...................................................................................................................................... 12
    COMPULSORY COURSES ......................................................................................................................... 13
    CORE COURSES ..................................................................................................................................... 14
TEACHING METHODOLOGIES ...................................................................................................................... 14
PROGRAM SPECIFICATION – M.PHIL PHARMACOLOGY .............................................................................. 15
OUTLINE OF SEMESTER WITH CREDIT HOURS .......................................................................................... 16
DETAILS OF SEMESTERS COURSE WORK .................................................................................................. 18
    Course Objectives: .................................................................................................................................... 18
    COURSE CONTENT .................................................................................................................................. 19
    GENERAL PHARMACOLOGICAL PRINCIPLES ......................................................................................... 19
    DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM ....................................................................... 21
    DRUGS ACTING ON RESPIRATORY SYSTEM .......................................................................................... 22
    GASTRO INTESTINAL DRUGS .................................................................................................................. 23
RECOMMENDED BOOKS & JOURNALS (latest edition) .............................................................................. 23
RECOMMENDED JOURNALS ......................................................................................................................... 25
COMPULSORY COURSES .............................................................................................................................. 25
    COMPUTER SKILLS .................................................................................................................................. 25
    Research Methodology ............................................................................................................................. 26
MANDATORY WORKSHOPS .......................................................................................................................... 28
EVALUATION & ASSESSMENT PROCEDURE: .............................................................................................. 29
SEMESTER II .................................................................................................................................................... 30
    DRUGS ACTING ON THE CENTRAL NERVOUS SYSTEM ..................................................................... 31
    CARDIOVASCULAR SYSTEM .................................................................................................................... 32
    DRUGS ACTING ON THE BLOOD AND THE BLOOD FORMING ORGAN ............................................. 33
Acknowledgement

SUPERVISED BY:

PROF. DR NAEEM AKHTAR  Dean of Basic Sciences RMU
PROF. DR SEEMI GULL  Chairperson Pharmacology & Therapeutics

AUTHORS

DR ATTIYA MUNIR  Assistant Professor Pharmacology & Therapeutics
DR OMAIMA ASIF  Demonstrator pharmacology & Therapeutics
INTRODUCTION TO UNIVERSITY

Rawalpindi Medical College was established in Faisalabad on 18th March 1974 and later shifted to Rawalpindi on 5th November 1974 in an incomplete building at Tipu Road (Science block of Gordon College Rawalpindi), that was later handed over to Rawalpindi Medical College.

The founder principal of RMC, Prof. Abdul Latif, worked hard to establish the institution.

First Rawalian Principal, Prof. Mohammad Umar after taking over the office in 2013, started working on multi-dimensional approach to further develop the institution. Since 1974 more than 7900 students have graduated and are serving nationally and internationally. RMC was privileged to claim top positions in university examination several times. Best of the best graduate in UHS is also a rawalian.

Because of the untiring and dedicated efforts of Prof. Muhammad Umer Rawalpindi Medical College was upgraded to Rawalpindi Medical University recently by Government of Punjab, Health Department on 6th May 2017. Higher Education Commission has given NOC to RMU.

The institute has strived to be upgraded to the level of an independent University after which the annual system of MBBS degree has been changed to the internationally preferred modular system. Now after the successful launching of MD/MS program by VC RMU we are struggling hard to get the M.Phil and PhD program approve.

PROF. MOHAMMAD UMER
FOUNDER VICE CHANCELLOR RMU
Mission Statement of RMU

To impart evidence based research oriented medical education

- To provide best possible patient care
- To inculcate the values of mutual respect and ethical practice of medicine

Vision and Values:

- Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals.
INTRODUCTION TO THE DEPARTMENT OF PHARMACOLOGY

The use of medicine is one of the principal ways of combating disease and Pharmacology is the science concerned with all aspects of drugs. The major academic objective of the department is to educate the medical students regarding fundamental knowledge of drugs and train them in rational use of drugs. The Department houses a well-equipped laboratory with experimental devices like Power Lab, Kymograph, Tissue Organ Bath and the latest audiovisual aids to teach experimental Pharmacology. There are spacious and well-resourced lecture halls and tutorial rooms to carry out different academic activities. The core curriculum and syllabus approved by Pakistan Medical & Dental Council and Higher Education Commission of Pakistan are followed to provide quality preclinical and clinical education in Pharmacology and Therapeutics. Pharmacology department in Rawalpindi Medical University (formerly named as RMC) was established in 1974. Firstly the department was situated in old teaching block on Tipu Road with all the other departments, then with the construction of the new teaching block in Holy Family Hospital in 2008 the department was shifted to the new block on 2nd floor.
INTRODUCTION TO PROGRAM

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

GOALS

1) To understand pharmacology in depth with understanding of the rational use of drugs, clinical pharmacology and to prepare themselves as competent teachers, good researchers & supervisors.
2) Introducing students to advances in micro teaching technology and Computer Aided Learning and medical education.
3) To orient students for research & development in Pharmacology.

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:

IN KNOWLEDGE

1 Possess a sound knowledge of the subject
   a. Basic principles of pharmacology, Clinical pharmacology and Systemic pharmacology
   b. Principles of essential drugs and rational use of medicines
2 Apply basic principles of pharmacology to practice rational use of existing drugs and evaluation of new drugs.
3 Collect and analyze experimental and clinical data related to drug kinetics and dynamics.
4 Provide appropriate advice related to selection of drug and their use Precautions and measures to be taken during administration of drug and develop the ability for continued self learning so as to update the knowledge of recent advances in the field of Pharmacology and allied fields.
5 Plan and carry out both laboratory and clinical research with adherence to scientific methodology.

**IN SKILLS**

1) Perform common experimental techniques
2) Be able to analyze and evaluate a research paper.
3) Be able to formulate and conduct problem based teaching/ workshops and seminars.

**IN ATTITUDES**

1) Appreciate socio-psychological, cultural and environmental factors affecting health and drug usage.
2) Adopt ethical principles while conducting experimental and human research
3) Realize the importance of team work
4) Develop attitudes required for professional responsibilities.
## RESOURCES

### Available Resources

### INTRODUCTION TO FACULTY

<table>
<thead>
<tr>
<th>FACULTY</th>
<th>QUALIFICATIONS</th>
<th>DESIGNATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor Dr. Seemi Gull</td>
<td>MBBS, M.Phil</td>
<td>Chairperson</td>
</tr>
<tr>
<td>Dr. Attiya Munir</td>
<td>MBBS, M.Phil, Certified Medical Educationist</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Dr. Zia ud Din</td>
<td>MBBS</td>
<td>Senior Demonstrator</td>
</tr>
<tr>
<td>Dr. Rubina Kouser</td>
<td>MBBS</td>
<td>Demonstrator</td>
</tr>
<tr>
<td>Dr. Sobia Javed</td>
<td>MBBS</td>
<td>Demonstrator</td>
</tr>
<tr>
<td>Dr. Arsheen Arshad</td>
<td>MBBS</td>
<td>Demonstrator</td>
</tr>
<tr>
<td>Dr. Omaima Asif</td>
<td>MBBS, Certified Medical Educationist</td>
<td>Demonstrator</td>
</tr>
<tr>
<td>Dr. Uzma Umer</td>
<td>MBBS</td>
<td>Demonstrator</td>
</tr>
<tr>
<td>Dr. Sajida Nasreen</td>
<td>MBBS</td>
<td>Demonstrator</td>
</tr>
<tr>
<td>Dr. Aqsa Noreen</td>
<td>MBBS</td>
<td>Demonstrator</td>
</tr>
</tbody>
</table>
INFRASTRUCTURE

The department of Pharmacology occupies 2 laboratories (Experimental lab & Research Lab), 2 lecture halls with seating capacity of 100 students per hall and 07 rooms for offices with the following details:

<table>
<thead>
<tr>
<th>Room Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairperson’s Room</td>
<td>01 ROOM</td>
</tr>
</tbody>
</table>
| Faculty Offices                         | Associate Professor 01  
                                          Assistant Professor 01  
                                          Staff Room 01  
                                          Computer Room 01                                                                 |
| Staff Room (support staff)              | 01 Room attached with the laboratory                                    |
| Seminar Room                            | 01 Room                                                                 |
| Departmental Library/reading room       | Departmental library present with 50 books approx & lecture CDs          |
| (number of books)                       |                                                                         |
| Committee Room                          | Seminar room is also used as committee room                              |
EQUIPMENTS

LIST OF EQUIPMENT PRESENT IN PHARMACOLOGY LABORATORY

<table>
<thead>
<tr>
<th>SR. NO</th>
<th>Name of Equipment</th>
<th>Quantity</th>
<th>Functional</th>
<th>Non-function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Multiple Power lab with accessories for all kind of experiment related to GIT, CVS, Respiration, CNS and Skeletal Muscle on isolated tissues and intact subject</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Kymograph (3CF Plamer + 4 SRI + 2 Howard)</td>
<td>09</td>
<td>06</td>
<td>03</td>
</tr>
<tr>
<td>3.</td>
<td>Howard tissue Bath</td>
<td>08</td>
<td>04</td>
<td>04</td>
</tr>
<tr>
<td>4.</td>
<td>Oscillograph (4 Channel + 2 Channel)</td>
<td>03</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Spectrophotometer</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Automatic Pipettes</td>
<td>03</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Hot Air Oven</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>pH Meter</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>9.</td>
<td>Water Distillation Machine apparatus</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Electronic Balance</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>Analytical Balance</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>Centrifuge Machine (Hermle)</td>
<td>01</td>
<td>01</td>
<td>-</td>
</tr>
<tr>
<td>13.</td>
<td>Computer with HP Laser printer</td>
<td>02</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>14.</td>
<td>Oxygen Gas cylinder</td>
<td>10</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>15.</td>
<td>Magnetic Stirrer with Hot Plate</td>
<td>01</td>
<td>-</td>
<td>01</td>
</tr>
</tbody>
</table>
ELIGIBILITY CRITERIA:

- Sixteen years of schooling or 4-years education after F.Sc. (minimum 130 credit hours) in the respective subject from HEC recognized institutions is a prerequisite for admission to M.Phil.
- The entry tests & interviews for admission to M.Phil of studies will be conducted through Departmental Admission Committee (DAC). Each faculty of the University is responsible to sort and verify documents, and suitability of the applicants.
- If applicant is a government servant, he/she needs to produce N.O.C., from the concerned department along with the study leave, where required.
- M.B.B.S with one year house job.
- Having 3 years teaching experience in relevant subject will be preferred.

COURSES OUTLINE

During the first year of M Phil students will have to complete their 30 credit hours of course work. The course work will consists of:

1 Compulsory courses =08 Credit Hrs
2 Core courses =22+ Credit Hrs as per HEC guidelines,

Note: 1 credit hour means 16 hours of lecturing. Credit hours shown as 2+1or 2+0 means 2 credit hours of theory and 1 credit hr of practical while “0” means no practical.
### Subject Guide Lines

#### SEMESTER 1  PHM - 01

<table>
<thead>
<tr>
<th>Course Work</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.5</td>
</tr>
<tr>
<td>Minors (Computer Skills)</td>
<td>01</td>
</tr>
<tr>
<td>Minors (Research Methodology)</td>
<td>01</td>
</tr>
</tbody>
</table>

#### SEMESTER 2  PHM - 02

<table>
<thead>
<tr>
<th>Course Work</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Work</td>
<td>07</td>
</tr>
<tr>
<td>Minors (Biostatistics)</td>
<td>01</td>
</tr>
<tr>
<td>Minors (Medical/Bioethics, Medical Education)</td>
<td>01</td>
</tr>
</tbody>
</table>

#### SEMESTER 3  PHM - 03

<table>
<thead>
<tr>
<th>Course Work</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Work</td>
<td>04</td>
</tr>
<tr>
<td>Rotation in Department (Specific to Research Work)</td>
<td>02</td>
</tr>
<tr>
<td>Research Work</td>
<td>02</td>
</tr>
</tbody>
</table>

#### SEMESTER 4  PHM - 04

<table>
<thead>
<tr>
<th>Research Work &amp; Thesis writing</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>08</td>
</tr>
</tbody>
</table>

### COMPULSORY COURSES ( 04 CREDIT HRS)

<table>
<thead>
<tr>
<th>COURSE</th>
<th>CODE</th>
<th>CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Biostatistics</td>
<td>BS</td>
<td>1+0 Credit Hrs</td>
</tr>
<tr>
<td>1.2 Research Methodologies</td>
<td>RM</td>
<td>1+0 Credit Hrs</td>
</tr>
<tr>
<td>1.3 Medical Education</td>
<td>MEd</td>
<td>1+0 Credit Hrs</td>
</tr>
<tr>
<td>1.4 Medical Ethics/Bioethics</td>
<td>ME/BE</td>
<td>1+0 Credit Hrs</td>
</tr>
<tr>
<td>1.5 Computer Skills</td>
<td>CS</td>
<td></td>
</tr>
<tr>
<td>1.6 Mandatory Workshops</td>
<td></td>
<td>6+0 Credit Hrs</td>
</tr>
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</table>
## CORE COURSES (22 + CREDIT HOURS)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hrs</th>
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</thead>
<tbody>
<tr>
<td>General Pharmacology</td>
<td>2+0</td>
</tr>
<tr>
<td>CNS Pharmacology</td>
<td>2+1</td>
</tr>
<tr>
<td>ANS Pharmacology</td>
<td>2+1</td>
</tr>
<tr>
<td>GIT</td>
<td>1+1</td>
</tr>
<tr>
<td>CVS</td>
<td>2+1</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>2+0</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>2+0</td>
</tr>
<tr>
<td>Anti inflammatory and Autacoids</td>
<td>2+0</td>
</tr>
<tr>
<td>Drugs Acting on the kidneys and Blood</td>
<td>1+0</td>
</tr>
<tr>
<td>Respiratory system</td>
<td>0.5+0</td>
</tr>
</tbody>
</table>

## TEACHING METHODOLOGIES

- Interactive Lectures
- Small Group discussions
- Practical
- Tutorials/ Presentations
- Seminars
- Journal Club
- Workshops
- Quiz
- Flip Class Room
# PROGRAM SPECIFICATION – M.PHIL PHARMACOLOGY

<table>
<thead>
<tr>
<th>COURSE TITLE WITH STUDY HOURS DISTRIBUTION</th>
<th>M Phil Pharmacology</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE TITLE</td>
<td>M Phil Pharmacology</td>
</tr>
<tr>
<td>COURSE DURATION</td>
<td>2 YEARS</td>
</tr>
<tr>
<td>TYPE OF STUDY</td>
<td>FULL TIME</td>
</tr>
<tr>
<td>STUDY SYSTEM</td>
<td>SEMESTER SYSTEM</td>
</tr>
<tr>
<td>TOTAL CREDIT HOURS</td>
<td>CH: 24-36</td>
</tr>
<tr>
<td>CREDIT HOURS DISTRIBUTION - SEMESTER WISE</td>
<td>CREDIT HOURS DISTRIBUTION</td>
</tr>
<tr>
<td>SEMESTER I =11.5</td>
<td>SEMESTER I =11.5</td>
</tr>
<tr>
<td>SEMESTER II = 10.5</td>
<td>SEMESTER II = 10.5</td>
</tr>
<tr>
<td>SEMESTER III = 08</td>
<td>SEMESTER III = 08</td>
</tr>
<tr>
<td>SEMESTER IV = 08</td>
<td>SEMESTER IV = 08</td>
</tr>
<tr>
<td>STUDY PER SEMESTER = 20 WEEKS</td>
<td>STUDY PER SEMESTER = 20 WEEKS</td>
</tr>
<tr>
<td>PREP LEAVE = 2 WEEKS</td>
<td>PREP LEAVE = 2 WEEKS</td>
</tr>
<tr>
<td>EXAMINATION = 1 WEEK</td>
<td>EXAMINATION = 1 WEEK</td>
</tr>
<tr>
<td>SEMESTER BREAK = 1 WEEKS</td>
<td>SEMESTER BREAK = 1 WEEK</td>
</tr>
<tr>
<td>WORKING DAYS = 8:00AM - 2:00PM (EXCEPT FRIDAY)</td>
<td>WORKING DAYS = 8:00AM - 2:00PM (EXCEPT FRIDAY)</td>
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# OUTLINE OF SEMESTER WITH CREDIT HOURS

<table>
<thead>
<tr>
<th>YEAR</th>
<th>SEMESTER</th>
<th>TITLE OF COURSE</th>
<th>COURSE CODE</th>
<th>CREDIT HOURS</th>
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<tbody>
<tr>
<td>1ST YEAR</td>
<td>1ST</td>
<td><strong>CORE COURSES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ General Pharmacology</td>
<td></td>
<td>2+0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ ANS</td>
<td></td>
<td>2+1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Respiratory System</td>
<td></td>
<td>0.5+0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ GIT</td>
<td></td>
<td>1+1</td>
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<td><strong>COMPULSORY COURSES</strong></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Research Methodologies</td>
<td>RM 1.2</td>
<td>1+0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Computer Skills</td>
<td>CS 1.5</td>
<td>1+0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ MANDATORY WORKSHOPS</td>
<td></td>
<td>2+0</td>
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<tr>
<td></td>
<td></td>
<td>(refer to table 1)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>➢ <strong>JOURNAL CLUB</strong></td>
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<tr>
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<td></td>
<td>➢ Selection of topic</td>
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<td>1ST YEAR</td>
<td>2ND</td>
<td><strong>CORE COURSES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ CNS</td>
<td></td>
<td>2+1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ CVS</td>
<td></td>
<td>2+1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ BLOOD &amp; DIURETICS</td>
<td></td>
<td>1+0</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>COMPULSORY COURSES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Biostatics</td>
<td>BS 1.1</td>
<td>1+0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Medical Ethics/Bio Ethics</td>
<td>ME/BE 1.4</td>
<td>1+0</td>
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<tr>
<td></td>
<td></td>
<td>➢ Medical Education</td>
<td>M.Ed 1.3</td>
<td>1.5+0 (included in compulsory courses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ MANDATORY WORKSHOPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(refer to table 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>JOURNAL CLUB</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1ST YEAR</td>
<td>2ND</td>
<td><strong>CORE COURSES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CHEMOTHERAPY</td>
<td></td>
<td>2+0</td>
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<tr>
<td></td>
<td></td>
<td>ENDOCRINOLOGY</td>
<td></td>
<td>2+0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AUTACOIDS &amp; RELATED DRUGS</td>
<td></td>
<td>2+0</td>
</tr>
<tr>
<td>2\textsuperscript{ND} YEAR</td>
<td>3\textsuperscript{RD} YEAR</td>
<td>MANDATORY WORKSHOPS (refer to table 3)</td>
<td>JOURNAL CLUB</td>
<td>RESEARCH</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------</td>
<td>---------------------------------</td>
<td>-------------</td>
<td>---------</td>
</tr>
</tbody>
</table>

| 2\textsuperscript{ND} YEAR | 4\textsuperscript{TH} YEAR | RESEARCH AND THESIS WRITING | MANDATORY WORKSHOPS (refer to table 4) | JOURNAL CLUBS | 4+0 | 2+0 | 0.5+0 |
DETAILS OF SEMESTERS  COURSE WORK

SEMESTER I
CREDIT HOURS= 11.5
DURATION= 20 weeks

SUBJECTS
- RM  1+0 credit hr
- CS  1+0 credit hr
- Selection of topic and synopsis
- GENERAL PHARMACOLOGY, ANS , RESPIRATORY SYSTEM & GIT

Course Objectives:
Upon completion of course the students will be able to:

1) Comprehend basic knowledge of pharmacology, drugs nomenclature and divisions of pharmacology
   a. Describe and comprehend the principles of pharmacopoeias, routes of administration, absorption and related topics
   b. Comprehend the mechanism of drugs action, bioavailability and excretion
   c. Comprehend knowledge of pharmacokinetics and pharmacodynamics
2) To discuss the types of adverse drug reactions and outline the process of drug development and approval
   a. Explain the general principles and steps in neurochemical transmission in ANS
   b. Characterize major neuronal systems in ANS and describe ways in which neuronal system may be altered by disease and drugs
   c. Discuss the types of shock, physiologic responses to shock, and the use of adrenergic drugs in the treatment of shock
3) Explain the uses, drug actions, general adverse reactions, contraindications and interactions of adrenergic blocking drugs
4) Discuss the uses, drug actions, adverse reactions, contraindications and interactions of the cholinergic drugs
5) Discuss the uses, drug actions, adverse reactions, contraindications and interactions of the cholinergic blocking drugs
6) Classify and explain different classes of antihypertensive agents and the rationale for the management of hypertension
7) Comprehend basic knowledge of drugs used for treatments of complications of respiratory systems
8) Comprehend the mechanism of action of drugs on respiratory system
9) Comprehend basic knowledge of drugs acting on GIT.

COURSE CONTENT

GENERAL PHARMACOLOGICAL PRINCIPLES

1. Definition Of Terms In Pharmacology:

(Pharmacology, Drug, Pharmacokinetics, Pharmacodynamics, Pharmacy, Clinical pharmacology, Pharmacotherapeutics, pharmacogenetics, Pharmacogenomics, chemotherapy, toxicology, pharmacopoeia, placebo, pharmacognosy and Drug nomenclature (chemical name, non-proprietary name, brand name) Essential drug concept, Orphan drugs, Sources of drugs with examples (plants, animals, minerals, synthetic, micro-organisms, genetic engineering)

2. Routes of drug administration:

Enteral route --- Oral, buccal, sublingual, rectal route,
Parenteral route --- Intravenous, intramuscular,
subcutaneous, intradermal,
Intra-arterial, intra-articular, intrathecal,
intraocular, Inhalation (for local and for systemic effect).

Topical application (for local and for systemic effect) Advantages and disadvantages of above mentioned routes.

3. Special drug delivery systems:
Transdermal, ocusert, implants, osmotic pump, liposome encapsulation,

4. Pharmacokinetics:

5. Pharmacodynamics:
(stimulation, depression, irritation, replacement, cytotoxic action) Mechanisms of drug action with examples:
Therapeutic index and therapeutic window, combined effect of drugs – synergism antagonism definitions with examples. Factors modifying drug action, tolerance (cross tolerance, tachyphylaxis,) drug resistance.

6. **Adverse drug reactions:**

   Classification, side effects, secondary effects, toxic effects, intolerance, idiosyncrasy, drug allergy, (types, treatment, examples) photosensitivity, drug toxicity – p glycoprotein, drug dependence, drug withdrawal reactions, teratogenicity, carcinogenicity, mutagenicity, drug induced diseases (Iatrogenic disease) – definitions with examples.

7. **Drug interactions:**

   Drug – Drug interactions, pharmacological basis of drug interactions, clinical Significance of drug interactions.

8. **Bioassay:**

   Definition, principles of bioassay and types of bioassay.

**DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM**

1. **General considerations-** Differences between somatic and autonomic nervous system, sympathetic and parasympathetic system, general outlay of autonomic nervous system, steps in neurohumoral transmission, co transmission.

2. **Cholinergic system-** Cholinergic transmission, characteristics of muscarinic receptors and nicotinic receptors. Cholinergic drugs* - classification, cholinergic agonists - cholinomimetic alkaloids, anticholinesterase, pharmacological actions and uses.
Pharmacotherapy of glaucoma and myasthenia gravis and anticholinesterase (organophosphorous compounds) poisoning.

3. **Anticholinergic drugs** - Classification, atropine (prototype), atropine poisoning

4. **Drugs acting on autonomic ganglia** - Clinically important ganglionic stimulants and ganglion blockers.


6. **Anti-adrenergic drugs** - Classification, α blockers - (Phenoxybenzamine as prototype), β blockers - (Propranolol as prototype) α & β blockers - (Labetalol)

7. **Recent advances**

* mechanism of action, pharmacological actions, adverse drug reactions, precautions, contraindications, preparations, drug interactions, therapeutic uses/indications.

**DRUGS ACTING ON RESPIRATORY SYSTEM**

1. **Drugs for cough** – Classification * Principles of choosing appropriate cough remedies, expectorants, mucolytics, antitussives, preparations & uses.

2. **Drugs for bronchial asthma** – Classification*, Principles governing the selection of drugs in bronchial asthma, inhaled asthma medication, precautions to be taken during their use. Management of acute attacks, prophylaxis and status asthmaticus.

3. Recent advances in pulmonary medicine
**GASTRO INTESTINAL DRUGS**

1. **Drugs used for the control of gastric acidity.** Drug treatment of peptic ulcer*-classification (H2 blockers*, proton pump inhibitors*, prostaglandin analogs, antacids). Treatment of helicobactor pylori infection.


3. **Agents used for constipation** – classification, laxatives, purgatives and hazards of purgatives.

4. **Drugs used in diarrhoea** – indications for the use of antimitotility agents*, antimicrobial agents and antisecretory agents and oral rehydration powder. Drugs used in therapy of inflammatory bowel disorders.

5. Recent advances in the Pharmacology of Gastro intestinal system

*mechanism of action, pharmacological actions, adverse drug reactions, precautions, contraindications, preparations, drug interactions, therapeutic uses/indications.

**RECOMMENDED BOOKS & JOURNALS(latest edition)**

1. Goodman & Gilman’s The Pharmacological Basis of Therapeutics - Goodman &Gilman’s. 12th Edition Laurance L, Brunton Ph.D, Bruce A
Chambner MD, Bjorn C Knollman MD Ph.D, McGraw Hill education pvt. Ltd.
3. Avery’s Drug Treatment - Graeme S Avery TM Speight, IDIS International.
5. Pharmacology & Pharmacotherapeutics – Satoskar.RS. Bhandarkar SD, Popular Prakashan, 
13. Netter’s illustrated pharmacology - Robert B. Raff, Scott, Frank Hendry netter. Illustrated Icon learning system,
RECOMMENDED JOURNALS

- Annual review in Pharmacology Annual Review in Medicine
- British Journal of Clinical Pharmacology
- British Journal of Pharmacology
- Clinical Pharmacology Lancet
- New England Journal of Medicine
- Pharmacological Reviews
- Trends in Pharmacological Sciences WHO Reports & Bulletin
- European journal of clinical pharmacology

COMPULSORY COURSES

❖ COMPUTER SKILLS

TEACHING STRATEGY – HANDS ON WORKSHOP

Course Contents:
The course contents will include:
Program Microsoft:
  • Word
  • Power point
  • Excel

Course Objectives:
Upon completion of course the students will be able to:
1. Develop basic skills in operating computer in the mentioned softwares.
2. Comprehend the basic principles of presenting scientific data at national and international platforms using computer and IT technology.
**Recommended Readings:**


**Journals:**

1. Journal of Bioinformatics and Computational Biology (JBCB)
2. BMC Bioinformatics

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**Research Methodology**

**Nature of course:**

Research Methodology is a hands on course designed to impart education in the foundational methods and techniques of academic research in social sciences and business management context. Research scholars would examine and be practically exposed to the main components of a research framework i.e., problem definition, research design, data collection, ethical issues in research, report writing, and presentation. Once equipped with this knowledge, participants would be well placed to conduct disciplined research under supervision in an area of their choosing. In addition to their application in an academic setting, many of the methodologies discussed in this course would be similar to those deployed in professional research environments.

**Course objectives:**

The primary objective of this course is to develop a research orientation among the scholars and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis. Some other objectives of the course are:

To develop understanding of the basic framework of research process

To develop an understanding of various research designs and techniques
To identify various sources of information for literature review and data collection

To develop an understanding of the ethical dimensions of conducting applied research

Appreciate the components of scholarly writing and evaluate its quality.

Course Contents:

1. Introduction to research – The role of research, research process overview
3. Thinking like a researcher – Understanding Concepts, Constructs, Variables, and Definitions
4. Problems and Hypotheses – Defining the research problem, Formulation of the research hypotheses, The importance of problems and hypotheses
5. Research design – Experimental and Non experimental research design, Field research, and Survey research
6. Methods of data collection – Secondary data collection methods, qualitative methods of data collection, and Survey methods of data collection
7. Attitude measurement and scaling – Types of measurement scales; Questionnaire designing – Reliability and Validity
8. Sampling techniques – The nature of sampling, Probability sampling design, Non-probability sampling design, Determination of sample size
9. Processing and analysis of data
10. Ethical issues in conducting research
11. Report generation, report writing – Title page, Abstract, Introduction, Methodology, Results, Discussion, References, and Appendices
# MANDATORY WORKSHOPS

**Table 1**

<table>
<thead>
<tr>
<th>FIRST SEMESTER</th>
<th>Credit hours</th>
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<tbody>
<tr>
<td>• Vision &amp; Time Management=3days</td>
<td>01 Cr. Hour</td>
</tr>
<tr>
<td>• Research methodology and Medical/Synopsis writing=3 days workshop (Hands on)</td>
<td>01 Cr. Hour</td>
</tr>
<tr>
<td>• Literature search and selection of research topic =1 day workshop</td>
<td>01 Cr. Hour</td>
</tr>
<tr>
<td>• Computer Skills=1 day</td>
<td></td>
</tr>
<tr>
<td>• Reference citation (End Note, Medley)=1 days</td>
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**Total Cr. Hour=03**
EVALUATION & ASSESSMENT PROCEDURE:

1. Assignment/Tests/Logbooks/Portfolio
   Total / Number of all percent marks  
   Weightage 30% marks 40%

2. End semester Examination
   a. MCQs 75 marks
   b. SEQs 75 marks
   c. Viva Voce/practical/OSPE 75+75 300 marks
   Total  
   Weight age 60 %

3. Calculate GPA as per University rules.
SEMESTER II
CREDIT HOURS = 10.5
DURATION = 20 WEEKS

COURSE CONTENTS:

- CNS
- CVS
- BLOOD & DIURETICS

Course Objectives:

Upon completion of course the students will be able to:

1) Describe neurotransmitters and the principles of neurotransmission in central nervous system.
2) Characterize the major neuronal systems in the CNS and describe the ways in which neuronal system may be altered by diseases and drugs.
3) Classify and give examples of drugs that affect the CNS.
4) Describe and comprehend the methods of demonstration of anesthesia and its stages and classification.
5) Explain the pharmacokinetics and the action of general anesthetic agents.
6) Describe the drugs used in epilepsy and the management of different types of epilepsy.
7) Identify drugs used to treat Parkinson’s disease.
8) Describe the drug management of migraine.
9) Know what drug dependence and drug abuse is and how to treat insomnia.
10) Comprehend basic knowledge of drugs used for treatments of Complications of cardiovascular
11) Comprehend the mechanism of action of drugs on cardiovascular system.
12) Describe the drugs acting on coagulation cascade
13) Comprehend basic knowledge of platelet adhesion and activation and the drugs acting as anti-platelet and thrombolytics

**DRUGS ACTING ON THE CENTRAL NERVOUS SYSTEM**

Physiological role of neurotransmitters (excitatory, inhibitory), principles of neuronal regulation and basis of drug action in the CNS.

2. **Local anaesthetics**
4. **Antiepileptic drugs** – Classification of drugs* Pharmacotherapy of epilepsy, Management of status epilepticus.
5. **Drugs for Parkinsonism** – classification of drugs*, pharmacotherapy of alzheimer’s disease, huntington’s disease, motor neuron disease.
6. **Antipsychotic drugs** – Classification* (chlorpromazine* prototype) Atypical Antipsychotics* Pharmacotherapy of Schizophrenia. Antianxiety drugs – Classification* Sedating, non sedating antianxiety drugs, Pharmacotherapy of anxiety. Antidepressant drugs – Classification* (Imipramine* prototype) MAO inhibitors Selective serotonin reuptake inhibitors (SSRI’s) Antimanic drugs – Lithium* and others.
7. **Opioid Analgesics** – Classification* (Morphine* prototype) Management of acute morphine poisoning, Other opioids, partial
agonists, agonist – Antagonists, Pure antagonists, Management of opium dependence.

8. **Drug addiction and drug abuse.**


10. Recent advances in CNS pharmacology

* mechanism of action, pharmacological actions, adverse drug reactions, precautions, contraindications, preparations, drug interactions, therapeutic uses/indications.

**CARDIOVASCULAR SYSTEM**

**DRUGS ACTING ON CARDIOVASCULAR SYSTEM**

**Drugs affecting renin angiotensin system**- angiotensin converting enzyme inhibitors angiotensin receptor antagonist.

**Drugs therapy of heart failure** – classification, Cardiac glycosides*, digitalis toxicity. Newer inotropic agents, role of vasodilators, beta blockers*, ACE inhibitors and diuretics in heart failure.

**Drug therapy of arrhythmias** – Classification*, classes, mechanism of action, indications.

**Lipid lowering drugs for the treatment of hypercholesterolemia** – Classification, Mechanism of action, pharmacological actions, adverse effects, contraindications drug interactions and uses.
Drug therapy of Hypertension – Classification*, angiotensin converting enzyme inhibitors, angiotensin receptor antagonist, calcium channel blockers, diuretics, beta-blockers, alpha-blockers, vasodilators, central sympatholytics. Management of hypertensive emergencies

Drugs for myocardial ischaemia – Classification*, rationale of combination therapy in angina pectoris, role of antiplatelet drugs. Drug treatment of myocardial infarction. Drugs used in peripheral vascular diseases.

Recent advances in cardio vascular pharmacology

mechanism of action, pharmacological actions, adverse drug reactions, precautions, contraindications, preparations, drug interactions, therapeutic uses/indications.

DRUGS ACTING ON THE BLOOD AND THE BLOOD FORMING ORGAN

1. Hematinics (Iron, vitamin B12 & folic acid)*, minerals (trace elements) and vitamins and clinical significance, preparations, uses, treatment of iron deficiency anemia, megaloblastic anemia, iron poisoning. Erythropoietin* and other growth factors.
2. Coagulants – Vitamin K*, fibrinogen.
3. Anticoagulants – Classification* thrombolytics*, antifibrinolytics and sclerosing agents
4. Plasma expanders and blood transfusion - Chemistry, pharmacokinetics, preparations, dosage and uses, adverse effects.
5. Drugs induced blood dyscrasias.
6. Drugs used in the management of shock.
7. Recent trends related with blood system.
DRUGS ACTING ON WATER, ELECTROLYTES AND DRUGS AFFECTING RENAL FUNCTION

1. **Diuretics** – Classification*, role of diuretics in acute renal failure and forced alkaline diuresis, site of action pattern of electrolyte excretion, short term and long term side effects and therapeutic uses.

2. **Antidiuretics** - Vasopressin (antidiuretic hormone) and vasopressin analogues)*

3. Recent advances in renal system

**COMPULSORY COURSES**

❖ **BIO STATISTIC**

**Course Contents:**

The course contents will include; Descriptive epidemiology, analytic epidemiology and epidemiological inference, Classification, morbidity and mortality rates, ratios, incidence, prevalence, sampling, screening, epidemiological models, Types of study design; their importance, uses, and limitations, field trials, controlled epidemiological surveys, sources of bias and causal models.

Introduction to statistics, types of statistical applications, population and samples, data analysis and presentation, variables, elementary statistical methods, tabulation, chart and diagram preparations, measures of central tendency and dispersion, sampling techniques and sample size estimation, probability and proportions, Tests of significance; normal test, t test, Chi square test etc, correlation and its applications, linear regression and multiple regression, Clinical trials and intervention studies, Measures for developing health statistical indicators: morbidity and mortality statistics,
Use of latest statistical computer software for data analysis.

**Course Objectives:**
Upon completion of course the students will be able to comprehend basic knowledge of epidemiology and will be able to:
1. Define epidemiology and know the principles of various study designs
2. Know how to design a study and describe the validity and reliability of a study design
3. Know the fundamental concepts and methods of statistics in the areas of medical and biological research
4. Have good command on use of statistical computer software for data analysis
5. Approaches for data analysis, Parametric, non-parametric and semi-parametric methods, Qualitative Methodologies and interpretation of results, validity of conclusions.
6. Identify and prioritize research problems with literature review.
7. Formulation of research objectives
8. Learn Data collection techniques and sampling, planning for data collection, collation and analysis.
9. Planning for pilot study followed by main study along with Budget making and plan for dissemination.
10. Identify and define the basic concepts and procedures required for data analysis and interpretation.
11. Analyse and interpret the data collected for the research project and draw conclusions related to the objectives of your study.
12. Write a clear and concise research report (paper for a peer reviewed journal) and a summary of the major findings and recommendations for each of the different parties interested in the results.
13. Present the major findings and the recommendations of your study to policy-makers managers and to the subjects of your research together with them to finalise the recommendations.
14. Prepare a plan of action for the dissemination, communication and utilisation of the findings and (if required) make recommendations for additional research.
(Objective 10 - 14 will also be covered in 3rd semester SPSS workshop)

**Recommended Readings:**

9. Statistical Software: SPSS; EPIINFO; STATA; SAS
10. Material provided as Health Services Course

**Journals:**

1. Cancer Epidemiology
2. Epidemiologic Reviews
3. Annals of Epidemiology
Rationale for the course:
Due to the advancement & development of innovative educational strategies with implementation of E.Learning environment, technology zenith and advance scientific research in medical & allied health, the health professionals (Basic sciences & clinical teachers) require to be acquaint with all these innovations and demonstrate essential skills & competencies as a physician, teacher, scholar, researcher and leader. This means that training of health professionals requires high standards of education at par with the realities of the practical world. Along with the expansion of health professionals as a need, a reform in health professions education is taking place world over e.g. Curriculum integration, implementation of PBL/CBL, use of simulator in teaching, virtual patients, OSCE/OSPE as an assessment tools etc. Therefore, this course is designed keeping in mind the basic requirements for a medical teacher (Basic sciences) in Health Profession Education to demonstrate the competencies of an effective medical teacher.

Course Goal:
The course is endeavors to train post graduate students (basic medical sciences) in basics of health profession education to produce competent health profession teacher.

Outcomes of Course:
By the end of the course the students will be able to:

4) Adept in basic knowledge and its application in the core areas of medical education i.e. educational environment & students, teaching and learning, curriculum development including educational strategies & curriculum themes, Students assessment and Program evaluation.

5) Acquire knowledge, skills and attitude requires for a competent health profession educator by understanding & applying the theoretical and empirical literature in medical education.

6) Critically examine the preparation requires for their role as educators of their profession through enhancing students understanding and implementation of principles of adult learning and teaching in relation to their target group.

7) Apply the educational theories and cognitive psychology in support of their role as an educator in practice.

8) Use knowledge and skills require for Designing & developing an integrated curriculum/Module at an undergraduate level.

9) Understand and apply the fundamentals of educational methodologies (Learning and Teaching) while “Teaching to learn and learning to teach”.

- Understand and apply the fundamental principles in ‘Assessment’ while designing an assessment plan and assessment tools.
• Design a plan with tools for evaluating a teaching program.
• Demonstrate effective communication skills (active participation, Proactiveness, professionalism, group dynamics, team building, conflict resolution, negotiation skills, leadership skills etc) while working in the group/team tasks.

Course Overview and description:
The whole course is based on principles of constructive cognitive philosophy and follows the FAIR criteria to improve learning. According to constructive philosophy the teacher is more than a transmitter of information and has responsibility for managing the student’s learning. The reflective teacher has an understanding of the principles of learning. Hence, this course has four key features identified for effective learning – the FAIR criteria:

| F | Feedback to the learner as to progress |
| A | Active rather than passive learning |
| I | Interest or motivation of the learner |
| R | Relevance to the perceived and real needs of the learner |

This course is designed for the post gradates medical students to develop them as an effective team member and effective teacher in an Integrated Curriculum development, its implementation and evaluation. The students will understand and apply the basic core concepts in medical education while working as Task Force member, conducting an integrated session for instance ‘Problem based Learning Sessions’ etc and assessing the students. The essential Core area and themes in medical education in which students will be trained are 1) educational environment & students, 2) teaching and learning strategies, 3) curriculum development including educational strategies & curriculum themes, 4) Students assessment and 5) Program evaluation. The course curriculum is structurally organized in these five Themes.

Instruction strategies:

• Interactive lectures by the teacher followed by the group discussions/activity weekly 1 hrs.
• Self-study and literature search- for assignment.
• Assignments (Students are expected to submit 02 evidence-based written assignment- 01 major & 01 minor)

Assessment strategy:

1: Formative assessment- there will be continuous assessment on the ongoing small group activities and attitude of each student and that will be recorded through an evaluation performas (checklists, rating scales) used during the sessions. Constructive Feedback will be provided on it by the teachers. Students, who will score satisfactory and achieve the minimum
required standard, will be allowed to sit in end of course/semester assessment.

2: Summative assessments

Assessment modalities:

For Knowledge:
5) Students are expected to submit 02 evidence-based written assignments (01 major & 01 minor related to major themes).

6) Final end of Semester Exam: At the end of the course there will be a Theory Exam comprises of MEQ (Modified Essay Questions).

For Skill and attitude:
a) It will be assessed through ongoing continuous assessment in small group activities, presentations and mini projects assigned during the classes and that will be recorded through an evaluation performas (checklists, rating scales).

Learning Resources:

- Journal Articles will be provided from the latest medical education journals.
- Other reading materials from the renowned author’s books and research work, some good websites.

Logistics / Training Resources for the course:
- Photostat facility for handouts and readings.
- Room for classes with multimedia.
- OHP and markers.
- Transparencies.
- Flip charts/stand and markers.
- Pointer.
- Paper reams (02).
- Folders to document course teaching and learning materials.

Course Content and Learning Objectives

THEME # 1
Introduction to HPE & Educational Environment

Number of Lectures: 04

Content:
1. Introduction to HPE and competencies required in HPE
2. Educational environment which effect the students learning- factors that enhance or inhibit the learning the learning.

**Learning Objectives:**
1. Introduce with the themes of HPE, trend, Issues & Challenges IN HPE & Competencies required in HPE.
2. Discuss the competencies of a Medical Teacher.
3. Identify the factors which constitute the educational environment and effect the students learning i.e. the factors that enhance or inhibit the learning.
4. Identify various learning styles, its merits and demerits- superficial and deep learning.

**THEME # 2**
**Teaching & Learning**

**Number of Lectures: 04**

**Content:**

1. The characteristics of adult learners- the principles of adult learning.
2. Different instructional methodology or modes of information transfer.
3. Teaching and Learning in large group: Interactive lecturing.

**Learning Objectives:**

1. Identify the characteristics of adult learners, and the principles of adult learning.
2. Link principles of adult learning with characteristics of modern curriculum.
3. Identify different modes of instruction and its strength and weakness.
4. Use the process of planning while designing & conducting large group teaching (Interactive lectures) session.
5. Use the process of planning while designing & conducting small group discussion session.
6. Discuss the principles process, role of tutors and students, student’s assessment in a PBL & CBL session.
7. Demonstrate effective communication skills (active participation, Proactiveness, professionalism, group dynamics, team building, conflict resolution, negotiation
skills, leadership skills etc) while working in the group/team tasks.

**THEME # 3**
**Curriculums: structural concepts and development**

**Number of Lectures: 04**

**Content:**

6. The curriculum and its components.
7. Various curricular philosophies & Perspectives- curricula past, present, future.
8. Innovative trends in curriculum, educational strategies and curriculum themes with emphasis on integration.
9. The Hardens 10 questions for curricular planning.
10. Differentiation between the aims, goals, outcomes, objectives
11. Writing Learning objectives and Levels in Bloom’s taxonomy of objectives for a course.

* The selection of core content while integrated curriculum development.
* Steps of Integrated Modules planning & development.

**Learning Objectives:**

1. Define curriculum.
2. Differentiate between the different components of a curriculum.
3. ‘Enlist Harden’s 10 questions for curricular planning & WFME standards
4. Discuss various curricular philosophies & Perspectives - curricula past, present, future.
5. Identify the trends in curriculum development, educational strategies and curriculum themes.
6. Discuss integrated curriculum and broad categories of integration in curriculum
7. Differentiate between the aims, goals, outcomes, objectives
8. Differentiate between the different levels in Bloom’s taxonomy of objectives.
9. Write learning objectives of 3 different domains for an integrated module and match it with the teaching and learning strategies.
10. Steps of Integrated Modules planning & development
11. Select core content while designing an integrated curriculum development.
THEME # 4
Assessments

Number of Lectures: 04

Content:

* Definition of assessment and evaluation.
* Differentiation between the formative & summative assessment, Criterion referenced and norm referenced.
* Characteristics of a good examination and definitions of validity and reliability of exams. Matching of learning objectives with the assessment tools.
* Design various assessment tools for knowledge, skill & attitude - M.C.QsSEQ, & OSCE/OSPE
* Importance and Contents of a table of specification.

Learning Objectives:

7. Differentiate between assessment and evaluation
8. Differentiation between the formative & summative assessment, Criterion referenced and norm referenced.
9. Discuss the characteristics of a good examination.
10. Match learning objectives with the assessment tools (Miller’s Pyramid).
11. Construct various assessment tools e.g. M.C.Qs, SEQ, OSCE/OSE
12. Match the objectives with the assessment tools.
13. Develop a table of specification for a module.

THEME # 5
Program Evaluations

Number of Lectures: 02

Learning Objectives:

1. Discuss the importance of evaluating a teaching session/ course/ program.
2. Identify the ways of assessing the effectiveness of an educational program.

EDUCATIONAL METHODOLOGY

1. Interactive Lectures
2. Small group discussions
3. Presentations
4. workshops
5. Assignments
6. Seminars
MEDICAL ETHICS/BIOETHICS

COURSE OBJECTIVES
The ethics curriculum is designed to provide students with the conceptual tools that they will need to navigate the ethical issues that are commonly encountered in clinical practice. Program helps students to develop skills in critical reasoning and in using the basic concepts of medical ethics it also fosters the habits of critical reflection and discussion about the ethical issues. ...

Thorough exploration of ethics is critical to developing exemplary scholars and teachers. Focusing on discussion, curriculum considers central ethical and legal principles, and research ethics.

COURSE CONTENT

• Professional Responsibilities
  o Student Responsibilities/ Professionalism
  o Qualities of a Physician/Codes of Ethics
  o Should Patients Be Learning Tools

• Central Ethical & Legal Principles
  o Duty to Provide Care (Trust & Fiduciary Responsibility)
  o Truth Telling and Informed Consent for Treatment
  o Confidentiality and The Duty to Warn

• Research Ethics [Epidemiology]
  o Ethical Dangers of Human Subject Research
  o The Importance of Research and The Development of New Therapies
  o The Common Rule: Requirements for The Ethical Conduct of Research

• Justice and Medicine
  o Justice in Clinical Practice
  o The Right to Health Care
• Allocation of Transplant Organs

• The Nature and Value of Autonomy
  o Concepts of Autonomy
  o Concept of beneficence
  o Concept of Non-maleficence
  o Standards for Surrogate Decision Making
  o Refusal of Treatment and Justified Paternalism
  o Advance Directives and Proxies

• Clinical Moral Reasoning: A Systematic Approach to Clinical Ethics
  Dilemma
  o Critical Care -Family Meeting
  o Emergency Medicine - Confidentiality and Legal Responsibility
  o Family Practice -Adherence and Compliance
  o Geriatrics -Giving Bad News
  o Medicine -Responding to Families
  o Neurology -Disclosing a Diagnosis
  o Ob/Gyn-Reproductive Choice
  o Pediatrics -Parental Discretion
  o Psychiatry -Treatment over Objection and Confidentiality
  o Surgery -Identifying Ethical Issues

• LEARNING OBJECTIVES OF COURSE

At the end of the course the student should be able to
  o Describe Student Responsibilities/ Professionalism
  o Enlist Qualities of a Physician
  o Discuss Codes of Ethics
  o Elaborate Trust & Fiduciary Responsibility
  o Describe importance of Truth Telling and Informed Consent for Treatment
  o Know Confidentiality and The Duty to Warn
  o Discuss Ethical Dangers of Human Subject Research
  o Describe Importance of Research and The Development of New Therapies
- Elaborate The Common Rule: Requirements for The Ethical Conduct of Research
- Explain Justice in Clinical Practice
- State The Right to Health Care
- Discuss Allocation of Transplant Organs
- Describe Concepts of Autonomy
- Enlist Standards for Surrogate Decision Making
- Discuss Refusal of Treatment and Justified Paternalism
- Describe Advance Directives and Proxies
- Explain
  - a. Confidentiality and Legal Responsibility
  - b. Adherence and Compliance
  - c. Geriatrics -Giving Bad News

- Analyze bioethics literature critically and comprehend the foundations of Bioethics theory
- Understand ethical issues regarding handling of research animals.
- Sacrifice research animals according to ethical principles.
- Comprehend basic knowledge of the ethical issues in biomedical research
- Comprehend ethical considerations in using animals for research experiments
- Prepare an animal model for research
- Exhibit attitude towards research on human volunteers, experimental animals and ethical aspects
- Understand 3 R rule regarding animals
- Learn the efforts to minimize the discomfort, infection, illness and pain of animal subjects.
- Interpret the results and draw inference
- Analyze bioethics literature critically and comprehend the foundations of Bioethics theory
- Understand ethical issues regarding handling of research animals.
- Sacrifice research animals according to ethical principles.
- Comprehend basic knowledge of the ethical issues in biomedical research
• Comprehend ethical considerations in using animals for research experiments
• Prepare an animal model for research
• Exhibit attitude towards research on human volunteers, experimental animals and ethical aspects
• Understand 3 R rule regarding animals
• Learn the efforts to minimize the discomfort, infection, illness and pain of animal subjects.
• Interpret the results and draw inference

**Recommended Readings:**

1. John Arras and Bonnie Steinbock. Ethical Issues in Modern Medicine, Mayfield, Latest Ed.
5. Glenn C. Graber and David C. Thomasma. Theory and Practice in Medical Ethics. Continuum, Latest Ed.
Benjamin Cummings, Latest Ed.


**Journals:**

1. Bioethics
2. Cambridge Quarterly of Healthcare Ethics
3. Hastings Center Report
4. Journal of Clinical Ethics
5. Journal of Medical Ethics
6. Journal of Medicine and Philosophy
7. Kennedy Institute of Ethics Journal
8. Nursing Ethics

**EDUCATIONAL METHODOLOGY**

- Interactive lectures
- Group Discussions
- Assignments
- Seminars
**MANDATORY WORKSHOPS**

**Table 2**

<table>
<thead>
<tr>
<th>SECOND SEMESTER</th>
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<tbody>
<tr>
<td>• Animal handling/bioethics/Medical Ethics = 8 hours</td>
<td>• Cr. Hour=0.5=counted in minors</td>
</tr>
<tr>
<td>• Grant application = 4 hours</td>
<td>• Cr. Hour=0.25</td>
</tr>
<tr>
<td>• Medical Education:</td>
<td>• Cr. Hour=0.75=counted in minors</td>
</tr>
<tr>
<td>➢ Leadership,</td>
<td></td>
</tr>
<tr>
<td>Communication skills,</td>
<td></td>
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<tr>
<td>Interactive lectures &amp; Small group discussion (SGD)= day 1</td>
<td></td>
</tr>
<tr>
<td>➢ How to attempt postgraduate SAQs = 3 hours= day 2</td>
<td></td>
</tr>
<tr>
<td>➢ Assessment tools(Objectively structured practical examination OSPE,</td>
<td></td>
</tr>
<tr>
<td>Multiple choice questions MCQs) = 3 hours= day 3</td>
<td></td>
</tr>
<tr>
<td>• Total Cr.Hour=1.5</td>
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</table>
EVALUATION & ASSESSMENT PROCEDURE:

4. Assignment/Tests/Logbooks/Portfolio
   Total / Number of all percent marks
   30% marks
   Weightage 40%

5. End semester Examination
   d. MCQs
   e. SEQs
   f. Viva Voce/practical/OSPE
   Total

   75 marks
   75 marks
   75+75
   300 marks
   Weight age 60 %

6. Calculate GPA as per University rules.
COURSE OBJECTIVES:

Upon completion of course the students will be able to:

1) Comprehend the basic principles of chemotherapy
2) Comprehend good command on all sorts of drug prescription for various diseases and health complications
3) Comprehend the classification of hormones and their mechanism of action on the targeted sites.
4) Describe the mediators of inflammation and immune reactions
5) Comprehend basic knowledge of anti-inflammatory drugs and autocoids
6) Comprehend the major inflammatory diseases and their therapeutics
7) Describe the current therapies based on manipulation of the immune system

COURSE CONTENTS:

- Chemotherapy
- Endocrinology
- Autacoids & related drugs

2. **Sulfonamides** – preparations, cotrimoxazole*


4. **Beta lactum antibiotics**: classification, Penicillins* (including semisynthetic, Acid resistant, penicillinase resistant, Extented spectrum), Beta lactamase inhibitors, Cephalosporins*,monobactams*, carbapenems*.

5. **Tetracyclines** and **chloramphenicol**.

6. **Aminoglycosides**- classification.

7. **Macrolide** and **miscellaneous antibiotics** –classification, newer macrolides*, clindamycin, Lincomycin, vancomycin, Teicoplanin, Linezolid, Fusidic acid, Polymyxin B, Bacitracin, Tyrothricin – Spectrum and uses.

8. **Pharmacotherapy of urinary tract infection**, **urinary antiseptics**, **Pharmacotherapy of sexually transmitted diseases.**

9. **Antitubercular drugs** –classification, first line drugs*, Second line drugs, newer drugs, antitubercular drug regimens, management of Adverse Drug Reaction with
antitubercular drugs, chemoprophylaxis, tuberculosis in AIDS, pregnancy, breast feeding, drugs used in Atypical Mycobacteria.

12. **Antileprotic drugs** - Classification, Pharmacotherapy, drug regimen (MDT), Alternative regimens, management of lepra reactions, newer drugs.

13. **Antifungal drugs**: Classification*, local, systemic mycoses management.


15. **Anti malarial drugs**: Classification, different forms of anti malarial therapy, management of cerebral malaria, radical cure, malaria prophylaxis, resistant malaria.

16. **Antiamoebic drugs**: Classification*, drugs for giardiasis.

17. **Drugs for trichomoniasis**,

18. **Drugs for leishmaniasis (kalazar)**.

19. **Anthelmintics**: classification*, choice of drugs for various worm infestation.

20. **Antifilarial drugs**.

21. Recent trends in chemotherapy and newer antimicrobial agents

* chemistry, spectrum of activity, mechanism of action, Pharmacokinetics, Preparations, adverse effects, interactions, precautions, uses.
CHEMOTHERAPY OF NEOPLASTIC DISEASES

Anticancer drugs: Classification*, general toxicity, general principles in chemotherapy of malignancy, cell cycle, toxicity amelioration.

DRUGS USED FOR IMMUNOMODULATION

1. The immune response
   General principles of immunosuppressive therapy, immunosuppressants*, Immunostimulants – BCG, Peptides, Immunoglobulins, Cytokines (Interferon -α, Interleukin-2, Levamisole).

2. Immune mechanism and drug allergy.

HORMONES AND HORMONE ANTAGONISTS

1. Hormones – Definition, different types and their mechanism of action.

2. Anterior pituitary hormones – Regulation of secretion, preparations and uses.

3. Thyroid hormones – Levo thyroxine*, antithyroid drugs*-classification, preparations and uses.


5. Glucagon – actions, uses.


9. **Drugs acting on uterus** – uterine stimulants- classification, uterine relaxants – Preparations*.

10. **Drugs affecting calcium balance**: Calcium parathyroid hormone, calcitonin, Vitamin D, preparations, uses. Bisphosphonates – actions, uses, Pharmacotherapy of osteoporosis.

11. Recent advances of therapeutics in endocrine system

12. **Drugs acting on uterus** – uterine stimulants- classification, uterine relaxants – Preparations*.

13. **Drugs affecting calcium balance**: Calcium parathyroid hormone, calcitonin, Vitamin D, preparations, uses. Bisphosphonates – actions, uses, Pharmacotherapy of osteoporosis.

14. Recent advances of therapeutics in endocrine system

**AUTACOIDS AND RELATED DRUGS**

Definition, the various autacoids, their physiological and pathological actions and effects and antihistamine drugs.

5HT(serotonin) – 5HT agonists and antagonists. Ergot alkaloids - preparations and uses.
Pharmacotherapy of migraine.

2. Bradykinin and their antagonists.

3. Angiotensin and ACE inhibitors* and angiotensin receptor antagonist.

6. Recent advances in autacoids related drugs.

*mechanism of action, pharmacological actions, adverse drug reactions, precautions, contraindications, preparations, drug interactions, therapeutic uses/indications.

MANDATORY WORKSHOPS

Table 3

<table>
<thead>
<tr>
<th>THIRD SEMESTER</th>
<th>Cr.Hour=1</th>
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<tr>
<td>• Basic and Advance Statistical analysis=3 days</td>
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<td>• Total Cr.Hour=1</td>
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EVALUATION & ASSESSMENT PROCEDURE:

7. Assignment/Tests/Logbooks/Portfolio 30% marks
   Total / Number of all percent marks Weightage 40%

8. End semester Examination
   g. MCQs 75 marks
   h. SEQs 75 marks
   i. Viva Voce/practical/OSPE 75+75
      Total 300 marks
     Weight age 60 %

9. Calculate GPA as per University rules.
SEMESTER IV
CREDIT HOURS = 08
DURATION= 6MONTHS
THESIS WRITING

Policy for M.Phil Thesis Writing:

- Student will select topic and get it approved in first semester.
- Student will write synopsis and get it approved in 2nd semester.
- In the 3rd semester student will do research work.
- In the 4th semester student will complete research work and write down the thesis.

The thesis submitted by M.Phil candidate shall comply with the following conditions:

(a) It shall form a distinct contribution to knowledge and afford evidence of originality, shown by the discovery of new facts, by the exercise of independent critical judgment, and/or by the invention of new methods of investigation.

(b) It shall not include research work for which a degree has already been conferred in this or any other university.

(c) It shall be written in Vancouver and the presentation must be satisfactory for publication.

(d) Any part of the thesis which has been published before submission of the thesis may be appended at the end of the thesis.

(e) The thesis shall be typed on a4 size (11.69”x8.27”) paper with margins of 1-½” on the left and 1” to the right, top and bottom of each page. The thesis shall be hard bound with cloth cover and golden lettering on the front and the spine.
EVALUATION & MONITORING OF THE TRAINING PROGRAMME

The proposed / suggested evaluation of the training program will be done by:

a. Head of the department / Supervisor

b. Head of the institution.

EVALUATION OF THE TRAINEE

360° evaluation of trainee as per HEC policy by:

- Head of institute
- HOD
- Supervisor
- Mentors
- Faculty members
- Demonstrators
- Laboratory technologists
- Academic staff
- Other students
- Patients

Students will be evaluated on the basis of:

- Attendance record
- Performance of the scheduled / desired activity
- Participation in discussion (tutorial and seminar etc.)
- Efficiency and effort put in the assignment (lectures, demonstration, Computer training etc)
- Quiz
- Practical work
- Presentation and Computing skills
### MANDATORY WORKSHOPS

#### Table 4

<table>
<thead>
<tr>
<th>FOURTH SEMESTER</th>
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<tr>
<td>• Article writing=4 hours</td>
<td>Cr.Hour=0.5</td>
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<tr>
<td>• Thesis writing=4 hours</td>
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</tr>
<tr>
<td></td>
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