

***The programs at IPDM are focused on basic, translational and clinical aspects in the fields of Chemical Pathology, Histopathology, Haematology, Microbiology and Oral Pathology. In addition, we aim to introduce new programs at IPDM.***

MPhil. Course Document

Research Degree Program In Basic Medical Sciences

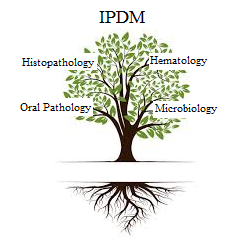




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1 Competencies **Error! Bookmark not defined.**

136. Objectives **Error! Bookmark not defined.**

a. Cognitive domain: **Error! Bookmark not defined.**

b. Affective Domain: **Error! Bookmark not defined.**

c. Research: **Error! Bookmark not defined.**

137. Content: **Error! Bookmark not defined.**

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Section I

Introduction

# Program Details

|  |  |
| --- | --- |
| **COURSE TITLE** | MPhil |
| **SPECIALTY** | Basic Medical Sciences (Haematology, Histopathology, Microbiology, Oral Pathology) |
| **COURSE DURATION** | Two years |
| **TYPE OF STUDY** | Full time |
| **STUDY SYSTEM** | Semesters system   * 4 Regular Semester   + 2 semesters for coursework   + 2 semesters for research work |
| **TOTAL CREDIT HOURS** | * Total Credit hours 30   + 24 Credit hours Course Work   + 6 Credit Hours Research work and Thesis |
| **DISTRIBUTION OF COURSES AND CREDIT HOURS** | * 1st semester (12 Credit hours)   + 4 Compulsory courses (8 Credit hours)   + Specialty courses (4 credit hours) * 2nd semester (12 Credit hours)   + Specialty Courses (8 Credit Hours)   + Optional Courses (4 Credit hours)  1. 3rd and 4th Semester (6 credit hours)  * Research work and Thesis Writing |
| **DEGREE AWARDING INSTITUTION** | Khyber Medical University  Peshawar |
| **TEACHING INSTITUTION** | Institute of Pathology & Diagnostic Medicine (IPDM)  Khyber Medical University Peshawar |
| **ADMISSION CRITERIA** | **For Chemical Pathology**  MBBS, BDS or equivalent medical qualification registered by the PMDC/PMC.  **For Haematology, and Histopathology**:  MBBS, BDS or equivalent medical qualification registered by the PMDC/PMC.  **For Microbiology**:  MBBS, BDS or equivalent medical qualification registered by the PM&DC or BS-4years, MS/MSc (BS- Microbiology/MLT/Biotechnology).  **For Oral Pathology:**  BDS, BD dental Technology or equivalent qualification fully recognized/ registered by the PMDC/PMC. |

Masters of Philosophy (MPhil)

# Vision

The goal of MPhil Basic Medical Sciences program is to extend the frontiers of knowledge through relevant interdisciplinary research; fostering an intellectual culture that bridges basic science and clinical practice; contributing to the enhancement of human health.

# Mission

This institute endeavors to be a world-class Institute providing quality knowledge in Basic Medical sciences to those who rightfully seek it. To strengthen its existing postgraduate programs by upgrading them and launching new ones for diversification and to facilitate the production of trained scientists and researchers who will meet the demands in the country.

# Overview

This two-year course shall include both *taught courses* as well as *research*. In the first semester students shall complete the core courses required by the Basic Medical Sciences program as well as completing research rotations whereby selecting a research supervisor and mentor. They shall complete a qualifying exam at the end. In the second semester the remaining courses in Basic Medical Sciences will be undertaken. In the third to fourth semesters they shall complete a research project, dissertation writing and defending their thesis.

# Outcomes

The Graduate of MPhil Basic Medical Sciences will have the attributes of a Subject specialist, scientific researcher, Educator, Effective communicator and Collaborator. By the end of the course students should have achieved the required level of,

* Subject based knowledge and skills
* Relevant basic as well as applied research in biomedical sciences
* Quality and credible research
* Presentation and communication skills
* Capability of teaching medical disciplines

# Core values

* Perform integrated interdisciplinary teaching and research with the highest level of ethics and professionalism, to meet the needs of stakeholders; and be responsive to changing global trends.
* Promote and defend the freedom of thought, academic enquiry, expression and association.
* Demonstrate sensitivity to student welfare and staff needs, and to practice environmental stewardship to the highest standards.

# Core Activities

* The institute instructs in the *biomedical sciences* related to Basic Medical Sciences.
* The institute trains postgraduate scholars in basic medical sciences in the degree programs leading to *Masters of Philosophy (MPhil)* in basic medical sciences, and *Doctor of Philosophy (PhD)* in basic medical sciences.
* In addition, the institute also invests in preparing active future basic medical science *researchers and teachers*.
* It engages its students in activities ranging from *optimization of laboratory* protocols and *animal handling* to *poster & oral presentations* and *critical reviews*.
* The institute arranges *research days and conferences* throughout the year, in which the new inductees are given an opportunity to develop an orientation regarding the core activities and structure of the department while the current students present their posters and critical reviews and receive feedback from the faculty members of different departments.
* Furthermore, students assessed for their understanding and application of knowledge through both *formative and summative assessments*.

# Teaching and Learning Methods

Students will experience a wide variety of teaching and learning methods from expert staff including *tutorials, lectures, seminars, workshops, small group discussions, and problem-based learning, and laboratory sessions*. As such the students will develop a wide range of skills useful in basic and applied environment. These skills will aid in *teamwork, scientific exploration, and problem solving and identifying relevant laboratory protocols*.

# Assessment Methods

Students will be assessed both *formatively and summatively*. Throughout the year formative assessment in the form of class tests, presentations and assignments along with the feedback will be carried out. Summative assessment will include end of the course terminal exam featuring multiple-choice questions. The practical aspects will be assessed using viva and Objective structured Practical examination (OSPE).

# Compulsory Courses

The MPhil basic medical sciences scholars are required to undertake a total of 4 Compulsory courses consisting of 8 credit hours in the first semester. In addition 2 compulsory courses of health professions education and health research of 3 credit hours each are taught in the third semester to all MPhil scholars.

# Specialty Courses

These courses are designed for the in-depth study of the different basic medical sciences specialties (**Haematology, Histopathology, Microbiology** and **Oral pathology).**The basic knowledge will be learned to a level to teach undergraduate and postgraduate students and professions allied to medicine. This part of the course is largely self-directed, with regular tutorials and laboratory sessions and taught by respective faculty. The related specialty courses of each specialty are mentioned in their corresponding sections.

# Optional Courses

An elective course is one chosen by a student from a number of optional subjects or courses in a curriculum, as opposed to a compulsory and speciality courses, which the student must take. Multiple optional courses will be available for students to select from. All the students will be required to select and undertake a maximum of two optional courses (4 credit hours in total). This will be done after the recommendation and approval from their respective supervisors/ departments. A faculty meeting prior to every semester will decide on the optional courses offered for that semester.

# Registration in the University

* A scholar for MPhil degree program shall be registered in teaching department/ institution of the University.
* Registrar of the university shall maintain a register of MPhil research scholars and assign a registration number to each scholar at the time of provisional admission.
* A "notification of registration" for each candidate approved /allowed for admission to MPhil program shall be issued by the University.
* Registration may be renewed on payment of the prescribed fee if a scholar is re-admitted within a year after having been struck off the rolls for any valid reason.
* A person registered for the MPhil degree program shall be called MPhil research scholar. Each student so selected shall be required to register and pay the dues within 30 days from the date of issuance of the notification of registration, failing which the admission of the selected candidate shall be deemed as cancelled. The university shall determine the tuition fee and other dues from time to time.

# Mentors

The students shall select their teaching mentor in the first and research mentor at the end of second semester. The coordinator shall serve as mentor before selection of mentors.

# Student Assessment Methods

a. Class quiz to assess continuous learning process

b. Terminal Examination to assess learning out comes

c. Presentations to assess communication skills

d. Assignments to assess writing skills

# Weighting of assessments Total marks=100

Midterm exam 25

Terminal examination 40

Oral/practical examination 10

Semester work (presentations) 05

Other types of assessment (assignments) 05

Poster presentations 15

**Total 100**

Review Process

# Year 1

The scholar shall clear end of semester qualifying exams to progress to next semester.

After successfully clearing two ends of semester exams, the student shall proceed to Year 2 of MPhil. The first review will include submission of MPhil student review form (Annexure I) and allocation of supervisors to the each MPhil student.

# Year 2

## 0-3 Month

The student shall submit a review of the literature for the potential project (1500 Words minimum, 2000 Words maximum) in the form of a scientific report.

The student should submit an MPhil Proposal to his/her supervisor for initial review. The supervisor will then assess the project and identify training needs if required.

The student should now accommodate supervisor comments, re-check from supervisor and submit research proposal to IPDM Graduate Study Committee. This should be followed by submission of “MPhil Student Review Form” (Annexure 1), literature review and defense of research proposal in the annual review meeting of the Advanced Studies Review Board (ASRB) and Ethical approval.

## 6thMonths (Review 2)

The review process of Year 2 includes,

* Bi-annual presentation# in the Department at the end of 6th and 9th month organized by the Head of the Department followed by submission of “MPhil Student review form”
* Scientific report\*

The student should be working on collecting data, optimize experiments, establish collaborations and develop experimental/research plan for successful completion of MPhil project. In addition the student shall submit a scientific report of maximum of 1500-2000 words.

Students and supervisors should complete the Bi-annual review process by stipulated dates of the year. Any student starting late will normally be permitted to delay submission of their annual report as decided by departmental head.

Two reviewers assigned by supervisor at the beginning of year 2 will assess the progress of student. The progress made by the student will then be communicated to the relevant supervisor and head of the department.

## 6th-9thMonths (Review 3)

At this point the students shall be doing the write up of their research projects and present it to their respective supervisors, who will review them as a part of bi annual research days.

### \*Scientific report

A scientific report preferably in the style of a journal article (6 to 10 pages maximum is recommended) summarizing progress made in the last year. It may therefore contain an abstract, introduction, materials and methods, results and discussion. In addition, there should be a 1500-2000 word section at the end of the report detailing the following year’s work (Future plans). To be sent to supervisor for assessment and comment (half a page maximum) and subsequently submitted to the reviewers.

### #Presentation

All MPhil students are required to deliver oral presentation in the meeting, especially organized for them. This is followed by discussion, including minimum of two subject experts. The decision will then be take decision regarding the registration of student for the next session.

### Thesis pending period

Final 9-month interview - Students at absolute thesis submission deadline will be interviewed specifically on their progress in the review meeting. For thesis writing guidelines see annexure II.

# Timeline for MPhil Process

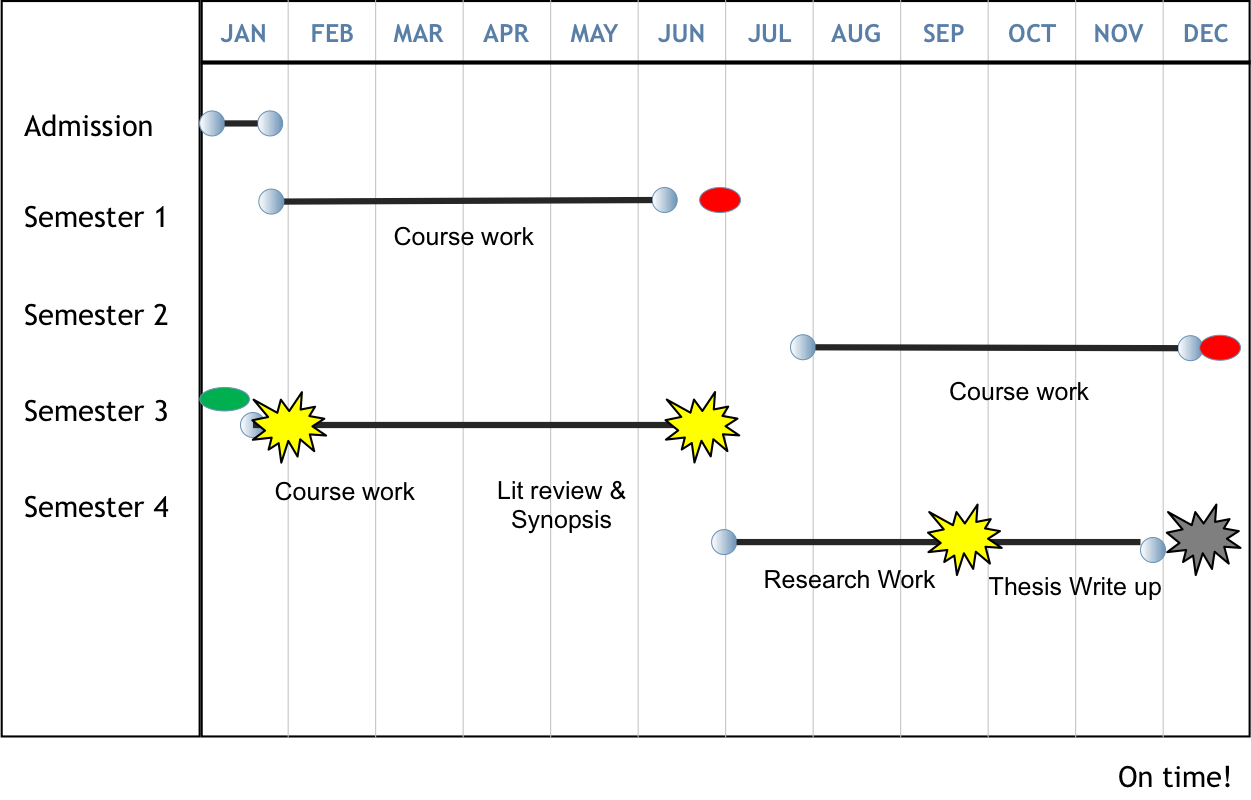


Figure 1Timeline for MPhil Process

Defense

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Review

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# Fellowships

A limited number of fellowships are available to support studies. Fellows will be expected to participate with faculty in the education of medical, professional, and graduate students working in both our teaching laboratories and classrooms. Acceptance into the program does not guarantee the awarding of a fellowship or any other financial assistance. Consideration for a Fellowship will be based on the qualifications of the candidate and the selection of the fellowship award recipient will be made solely by the Director.

# Application

Students are usually admitted in the beginning of the spring semester. Application requirements include official transcripts, official scores on the Graduate Record Examination, three letters of recommendation, a resume/cv and a goals statement. Materials should be uploaded as part of your online application.

# Duration of MPhil Degree

A HEC recognized supervisor would supervise the research work and award of degree and co-supervisor from related areas of expertise. Upon admission to MPhil program a supervisor will be allotted to the enrolled student who will guide the student in the selection of his/her area of research along with the development of research proposal and protocol. The supervisor and co-supervisor will also ensure that the student develop essential skills according to his area of research.

The requirements for MPhil degree shall normally be completed within two years from the date of registration. The maximum time for the completion of MPhil degree shall be four years from the date of registration in the MPhil program. Only under exceptional circumstances, to be described in detail by the MPhil candidate and supported by the supervisor, the respective statutory body may allow extension of up to one year beyond the maximum time limit of four years. A total of 36 hours (24 credit hours coursework, 12 hours dissertation and research work) is required for graduation.

# Qualifying Examinations and Defense

## End of Semester Exam

Upon completion of the core curriculum, the student must prepare for and successfully pass the MPhil qualifying examination at the end of each semester (1 &2) to test their knowledge of basic medical sciences grasp of relevant literature, and the ability to form research hypotheses and experimental design. It shall be a written and oral exam.

# Submission of thesis

The copies of MPhil thesis (both hard and soft) must be submitted to university library for record purposes.

## MPhil Oral Qualifying Examination (Thesis defense)

### Prerequisites

Prior to the MPhil student’s request for consideration for the defense, the student must have;

* Completed most of their required course work
* Successfully passed their end of semester exams.
* Submission of their research proposal to Graduate studies, ASRB and ethical board.
* The oral qualifying exam will be scheduled after the student has submitted a detailed dissertation research.
* The Plagiarism test must be conducted on the Dissertation before its submission to the two external reviewers.
* After the approval from the 2 external reviewers, the dissertation will be forwarded to internal and external examiners for deliberation before the defense (See Annexure III).
* The thesis shall be submitted to the internal examiner at time of submission to external examiners.
* The internal examiner preferably has to be the subject specialist but in-case of non-availability an examiner may be selected from other departments in the institute. However the examiner has to have expertise in the field with the pre-approval of Dean Basic Medical Sciences.

### The Defense

* The defense of the dissertation provides an opportunity for the student to formally present their findings to his/her examiners.
* At maximum, Two weeks before the dissertation defense an electronic and print announcement of the date, time, location, and title of the defense will be provided to the student and the supervisor.
* After reviews have been received the student shall make the appropriate changes and submit at minimum two corrected copies on the day of the defense.
* All raw data and slides/samples etc. have to be deposited with the supervisor at or before the time of the defense.
* All external examiners must be from the list of approved examiners by statutory bodies.
* All documentation/ transcript related to the thesis defense shall maintain a chain of secrecy to avoid any mishaps/changes in transcripts.
* The defense will consist of 2 phases; firstly the student will make an oral, PowerPoint presentation of his/her project for no longer than 20minutes, followed by the question answer session by the examiners.
* Once thoroughly evaluated, the examiners will make their final declaration and the MPhil degree will be awarded to the student.

Thesis report and certificates printed by IPDM admin to Dean BMS or Director IPDM, External and Internal examiners fill and sign the reports, resubmitted to the Dean BMS or Director IPDM forwarded to the controller of exams, KMU.

# Program structure

**As detailed in Section1: Program details**

Merit based on entrance test (40%), Academic record (40%) & Interview (20%)

This test will be of equivalent level to subject GRE / GAT, and in line with HEC rules and regulations. Minimum Passing criteria will be 50 % or above.

Eligibility

Selection

Course work

Year 1: Semester 2

Course work (12 credit hours)

Year 1: Semester 1

Course work (12 credit hours)

Year 2: Semesters 3 & 4

Research work and Thesis writing (6 credit hours)

Semester 4: 6th -9thh month

Write up

9th -12th month

Write up and Evaluation of thesis

**Thesis Defense, Award of MPhil degree**

Course work & Research

Thesis & examination

Qualifying Exam

Qualifying Exam

Review -1 Supervisor/s allocation &MPhil Student review form

Review-3

1. 0-3rd Month

Submission of

* Literature review 1500-2000 words max
* MPhil Proposal for initial review
* MPhil Student review form
* Research proposal in the ASRB for approval of the project
* Synopsis for Institutional Ethical approval

1. 6th Month

Data collection, analysis and submission of the project’s scientific report (1500-2000 words max)

Review-2

**Figure 2MPhilProgramStructure & Evaluation**

Section 2

Compulsory Courses

**M.Phil. Compulsory Courses**

## 

## FIRST SEMESTER (SPRING, 12 CREDITS)

COMPULSORY COURSES

1. BMS701- Cell and Molecular Biology (1+1) Cr Hours
2. BMS702 Applied Biostatistics (1+1) Cr Hours
3. BMS703 Communication skills and Health Research (1+1) Cr Hours
4. BMS704 Biosafety and Research Ethics (1+1) Cr Hours

Total 8 Cr Hours

SUBJECT COURSES

Two subject courses 4 Cr Hours

Total Credits in First Semester 12 Cr Hours

**2ND SEMESTER SUBJECT COURSES** 12 Cr Hours

**THIRD AND FOURTH SEMESTER (RESEARCH WORK AND THESIS WRITING**

1. BMS 799 Research work and Thesis Writing (6+0) Cr Hours

Total Credits (6 Cr Hours)

**Total Credits for MPhil Degree 30 Cr Hours**

BMS 701: Cell and Molecular Biology

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to comprehend basic knowledge in the:

* Cell structure and organization
* DNA replication, transcription, protein synthesis and enzymology
* Molecular genetics like DNA recombination, gene structure, function and regulation as well as cell  signaling pathways and cancer
* Molecular cloning and molecular tools for studying genes and gene activity
* DNA structure and function
* The language of genetics and the terminology of molecular biology

# Course Contents:

The course contents will include;

Introduction to the study of cell biology, the chemical basis of life, techniques in cell and molecular biology, enzymes and metabolism, mitochondrion and aerobic respiration, the structure and function of the plasma membrane, cytoplasmic membrane systems, interactions between cells and their environment, the nature of the gene and genome, expression of genetic information, cytoskeleton and cell motility, cellular reproduction, cell signaling and cancer. DNA - the Genetic Code, Structure, Replication, and Manipulation of DNA, Transmission Genetics, Basic and Advanced Principles of Heredity, The Chromosomal Basis of Heredity, Gene Linkage and Genetic Mapping, Human Karyotypes and Chromosome Behavior, The Genetics of Bacteria and Viruses, Molecular Mechanisms of Prokaryotic Gene Regulation, Genetic Engineering and Genomics, Mechanisms of Mutation, Cancer, The Basics of Population Genetics

## Recommended Readings:

* Hart, D. L. and E. W. Jones. Essential Genetics: A Genomics Perspective. Sudbury, MA: Jones and Bartlett Publishers, Latest Ed.
* Benjamin Pierce. Genetics. W. H. Freeman, Latest Ed. Jeremy W. Dale, Malcolm van Schantz. From Gene to Genome. John Wiley & Sons Ltd, Latest Ed.
* A Miches. Genetic Techniques for Biological Research. John Wiley & Sons Ltd, Latest Ed.
* Leland Hartwell, Leroy Hood, Micheal Goldberg, Ann Reynolds, Lee Silver, Ruth Veres. Genetics: From Genes to Genomes. McGra-Hill Science, Latest Ed.

### Journals:

* Biology of the Cell
* Nature Cell Biology
* Cell & Tissue Research
* Journal of Cellular Physiology
* Journal of Cellular Biochemistry
* Journal of Molecular Cell Biology
* Chromosome Research
* Molecular Genetics & Genomics

BMS 702: Applied Biostatistics

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to comprehend basic knowledge of epidemiology and will be able to:

* Know how to design a study and describe the validity and reliability of a study design
* Know the fundamental concepts and methods of statistics in the areas of medical and biological  research
* Have good command on use of statistical computer software for data analysis

# Course Contents:

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.

## Recommended Readings:

* Gordis, L. Epidemiology. Pennsylvania: W.B. Saunders Company. Latest Ed.
* Rothman KJ. Modern Epidemiology. Boston: Little, Brown and Company, Latest Ed.
* Kelsey JL, Thompson WD, Evans AS. Methods in Observational Epidemiology. New York: Oxford University  Press, Latest Ed.
* Kleinbaum DG, Kupper LL, Morgenstern H. Epidemiologic Research: Principles and Quantitative Methods.  Belmont, CA: Lifetime Learning Publications, Latest Ed.
* Lilienfeld DE, Stolley PD. Foundations of Epidemiology. New York: Oxford, Latest Ed.
* Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences. Latest Ed. John Wiley & Sons.  Inc. New York.
* Larson R and Farber B. Elementary Statistics: Picturing the World. Latest Ed, Prentice Hall Publications. New  Jersey USA.
* Oliver, M. and Combard MS. Biostatistics for Health Professions. Latest Ed. Prentice Hall Publications, New  Jersey USA.
* Statistical Software: SPSS; EPIINFO; STATA; SAS

### Journals:

* Cancer Epidemiology
* Epidemiologic Reviews
* Annals of Epidemiology
* American Journal of Epidemiology
* International Journal of Epidemiology

BMS 703: Communication Skills & Health Research

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Learn the basics of Clinical and research communication skills
* Learn face to face and interpersonal communication, class room communication skills, meeting with the supervisor, email communication and interview skills,
* Present and communicate research articles/data in conferences and symposia.
* Critically analyse data, design a project and write up research proposals.
* Design experiments in the field of biological sciences.
* Collect information from the available resources, Prepare a presentation on a given topic, Deliver a lecture and manage a question-answer session
* Distinguish different types of research, their audiences and how research material might be effectively presented
* Format documents and presentations to optimize their visual appeal
* Effectively use features of Microsoft Office to create eye-catching professional documents and presentations.
* Effectively use features of Microsoft Word, Power point, and Excel to create professional looking tables, graphs and figures.
* Accept constructive criticism and use reviewers’ comments to improve quality and clarity of written reports and presentations
* Work as a productive member of a task force

This course is designed to enable students to develop critical evaluation skills in a practice rather than academic context. This module provides students with an introduction to quantitative and qualitative research methods and to the types of skills necessary for the planning, data gathering and dissemination stages of health-related research. The development of research capacity is also expected to equip the health professionals with knowledge and skills to practice evidence based medicine and evidence based decision-making in health care policy-making and management and public health interventions implementation.

The program will stress upon hands-on training to develop knowledge and skills for research problems identification and prioritization, preparation of research project proposals and protocols, searching for literature, preparation of research plans and budgets, research reports and publications writing and reviewing of research proposals and publications. The program constantly challenges the students to enhance their learning and skills by giving the regular assignments and encouraging guide self-learning. The assignments are specifically aimed at developing writing skills and critical appraisal of published literature. Students are encouraged to learn to systematically develop research questions, identify and apply most appropriate research design, review research literature, critically evaluate evidence, and apply a range of research approaches relevant to health services and clinical problems.

# Course Contents:

The course contents of this subject include: Basic communication skills for doctors and researchers, Interpersonal communication skills, e-communication skills including emails and e-conferencing/teleconferencing, Interview skills and presentation methodologies, Classroom communication skills and teaching methodology,

Methods in research include basic of academic writing, study designing and synopsis writing, research techniques as well as problem analysis, observations, data compilation and questionnaire designing. Academic essay writing, reading skills and critical appraisal of research articles, Writing quality literature reviews and research articles, Completion of research project and thesis writing. Theoretical knowledge of the students will be supplemented by hands on practical training in the formulation of research project designing, and completion of the project successfully. Academic writing will include learning of some bibliographic software like Endnote and data analysis softwares.

1. Competencies

The student as a “Subject expert”, “Communicator” and“ Research Scholar”. These competencies are then further expanded upon by objectives designed to cover the development of knowledge, skills and behaviour of the students by the time they graduate.

By the end of the course, the graduate of MPhil scholar must have acquired a reasonable working knowledge of:

a. Cognitive domain:

1. Basic understanding of the underlying principles of quantitative and qualitative research, the links between the two and identify the advantages and disadvantages associated with these designs

2. An appropriate mixed-method research study to answer a health-related research question.

3. The key data generation methods of current use in public health and health-related research

4. Most appropriate research method to address a particular research question

5. A range of quantitative and qualitative approaches to analysis

6. Skills to undertake the design of a health-related research proposal

7. A research proposal suitable for submission to a research funding body.

8. Developing and practicing a range of information and research skills to enable them to initiate and carry out research leading to improvements in their own professional practice and in the quality of patient care.

9. Information and information technology for health research.

b. Affective Domain:

1. Manage time and courses to submit assignments on time

2. Apply principles of professional conduct in paper submission (plagiarism)

3. Demonstrate professional behavior by completing all course requirements, including course evaluations, in a timely manner.

4. Demonstrate responsibility and accountability by attending and being punctual at all required course activities such as laboratory sessions, workshops and exams.

5. Demonstrate professional behavior by requesting any excused absence from required course activities well ahead of the scheduled date.

6. Demonstrate professional behavior by responding to direct communication from the course faculty in a timely fashion, particularly in circumstances when a face-to face meeting is requested to discuss issues related to academic performance.

7. Demonstrate professional and ethical behavior by honestly completing course examinations without attempting to seek an advantage by unfair means; and by reporting any unethical behavior of peers to the course administration.

c. Research:

1. Critically analyse research articles and develop a literature review.

2. Discuss the research based recent advances in the relevant field.

3. Learn to interpret the findings in the medical literature for future research

4. Improve critical appraisal skills and conduct it effectively

5. Earn skills related to oral and written presentations

6. Comprehend the limitations of the application of evidence

7. Develop an understanding for the principles of a research proposal

## Recommended Readings:

* Clinical communication skills by Richard Fielding
* Communication skills Magic EG Sebastian
* Interpersonal communication by Marco Tapia
* Arifullah, Shahnaz, and Bhatti K.M Research process simplified, Peshawar Latest Ed.
* Introduction to Academic Writing by Alice Oshima, Ann Hugue
* Academic Writing, A handbook for International students by Stephen baily
* W.H.O. Training manual on health research methodology Latest Ed.
* Research Methods and Statistics by Sherri L Jackson

**Course Assessment criteria:**

1. This course will be evaluated using assignments and synopsis presentation:
2. 1) Literature Review with Hypothesis.
3. 2) Methodology & Analysis Plan.
4. 3) Reflective Portfolio.

### Journals:

* Journal of Communication
* Journal of Communication Theory
* European Journal of Communication
* Journal of Developing Effective Communication Skills
* International Journal of Business Communication (Sage Journals)
* Journal of Telematics and Informatics
* Journal of Written Communication
* Methods and Protocols
* Journal of Academic Writing (Coventry University)
* Journal of Academic Writing (Publon)
* Journal of Writing Research
* Journal of English for Academic Purposes
* Journal of Critical Reviews - Innovare Academic Sciences
* BMJ Evidence Based Medicine

BMS 704: Biosafety & Research ethics

(1+1 Credit Hrs)

# Course Objectives:

* To empower students with the skills, tools, and confidence on sustainable bio-risk management.
* To enable them to apply principles of biosafety and biosecurity in facilities.
* To reduce/eliminate the risk of infection in laboratory setting.
* Comprehend basics of research in light of the modern ethics
* Comprehend basic knowledge of the ethical issues in biomedical research
* Select and design research project and critically analyze and communicate scientific data
* Analyze literature critically and comprehend the foundations of Bioethics theories
* how to deal with patients within the boundaries of biomedical ethics
* how to improve the basic health care services on ethical grounds

## Course Contents:

1. BRM introduction, scope & importance
2. Terminology
3. AMP Model – brief introduction
4. Biorisk assessment
   1. Hazards & threat identification & analysis (frequency and magnitude)
   2. Levels of biological risks
   3. Likelihood & consequences evaluation
5. Biorisk mitigation – introduction/ brief account of a-e
   1. Elimination & substitution
   2. Engineering control
   3. Administrative control
   4. Practices & procedures
   5. PPE
6. Performance – introduction
   1. Key elements of performance
   2. Control (monitoring protocols)
   3. Assurance
   4. Improvement
7. **Biosafety** – Introduction, purpose, requirement
   1. Biosafety Levels – brief description of levels 1 – 4
   2. BSL-1
   3. BSL-2
   4. BSL-3
   5. BSL-4
   6. Laboratory Design & Facilities
8. GLWPs - importance
   1. Responsibility for enforcing GLWPs
   2. Barriers to glwps
   3. Lab equipment calibration & validation
9. PPE,

**Biosecurity** – introduction, principles, history, objective

* 1. Key pillars of biosecurity
     + Physical security
     + Personal management
     + Information security
     + Transport security
     + Material control & accountability
  2. Incident Management:Scope
  3. Incident response system
  4. Incident reporting

1. Waste management: Collection, segregation, transportation, storage & disposal
2. Decontamination
3. Introduction to medical/bioethics
4. Ethical Theories
5. Historic perspective of bioethics in the development of vaccines and medicine and clinical trials, The Four Basic Principles of bioethics and their importance in research,Ethical justification and scientific validity of biomedical research involving human subjects
6. Ethical review committees. Ethical review of externally sponsored research,
7. Obtaining informed consent: Essential information for prospective research subjects, Inducement to participate in research, Benefits and risks of study participation
8. Ethical justification of research involving individuals who are not capable of giving informed consent, Children, mentally retarded, behavioural disorders, Choice of control in clinical trials, and Research involving vulnerable persons, children, women and pregnant women.
9. Safeguarding confidentiality, Bioethical research involving animals and research misconduct.

### Recommended Readings:

* Good Medical Practice (2013); General Medical Council
* CIOM Guidelines available online
* Beauchamp T, Childress J; Principles of Biomedical Ethics, 7th Edition. Oxford University Press.
* Antoniou SA, Antoniou GA, Granderath FA, et al; Reflections of the Hippocratic Oath in modern medicine. World J Surg. 2010 Dec;34(12):3075-9. doi: 10.1007/s00268-010-0604-3.
* Good Medical Practice - Explanatory Guidance; General Medical Council
* Managing a child or young person with suspected maltreatment; NICE CKS, March 2014 (UK access only)
* Confidentiality and information sharing; National Treatment Agency for substance misuse, 2003

### Journals:

* Applied biosafety
* Journal of Biosafety
* International Journal of Biosafety and Biosecurity
* [Bioethics](http://www.blackwellpublishers.co.uk/asp/journal.asp?ref=0269-9702)
* [Cambridge Quarterly of Healthcare Ethics](http://uk.cambridge.org/journals/cqh/)
* [Hastings Center Report](http://www.thehastingscenter.org/Membership/memberdefault.asp)
* [Journal of Clinical Ethics](http://www.clinicalethics.com/)
* [Journal of Medical Ethics](http://www.bmjpg.com/template.cfm?name=specjou_me)
* [Journal of Medicine and Philosophy](http://www.swets.nl/sps/journals/jmp.html)
* [Kennedy Institute of Ethics Journal](http://muse.jhu.edu/journals/kennedy_institute_of_ethics_journal/)

Section 2

Specialty courses

## M.Phil. Chemical Pathology courses

**Compulsory courses**

## FIRST SEMESTER (SPRING, 12 CREDITS)

**COMPULSORY COURSES**

* BMS701- Cell and Molecular Biology (1+1)Credit Hrs
* BMS702 Applied Biostatistics (1+1) Credits Hrs
* BMS703 Communication skills and Health Research (1+1) Credits Hrs
* BMS704 Biosafety and Research Ethics (1+1) Credits Hrs

Total Credits (8 Credit Hours)

**SPECIALITY COURSES**

CHP 701: General Pathology 1+1 credit hours

CHP 702: Analytical Techniques & Instrumentation 1+1 credit hours

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No. of credit hours 4 Credit Hrs

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**Total no. Of credit hours (12 Credit Hours)**

**SECOND SEMESTER (FALL, CREDITS 8 PLUS 4)**

**SPECIALTY COURSES**

CHP 703: Carbohydrates, Lipids, Proteins, enzymes 1+1 credit hours

CHP 704: Kidney, GIT and Hepatobiliary System 1+1 credit hours

CHP 705: Water, Electrolyte, Acid Base Balance and Blood Gases 1+1 credit hours

CHP 706: Endocrinology 1+1 credit hours

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No. of credit hours 8 credit hours

**Elective/optional courses (Any 2, 4 credit hours)**

CHP 707: Inborn errors of metabolism, Pregnancy and fetal wellbeing 1+1 credit hours

CHP 708: Tumor markers 1+1 credit hours

CHP 709: Vitamins, minerals and Trace Elements 1+1 credit hours

CHP 710: Therapeutic drug monitoring and toxicology 1+1 credit hours

CHP 711: Enzymology 1+1 credit hours

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**Total no. of credit hours in 2nd Semester 12 credit hours**

**CP 702: Analytical Techniques and Instrumentation**

**Basic Laboratory Techniques and Equipment**

* Components, Principles, Operation and Maintenance of Basic Laboratory Equipment including Centrifuge, balances, automatic pipettes, water bath, incubators, refrigerator, freezer, glass and plastic ware, deionizer, distillation plant etc.
* Structure of SI Units, conversion factors from old system of units to SI Units, Units in clinical enzymology and Standardized reporting of lab results.

**Instrumentation**

* Features, principles, working and maintenance of major instruments
* Comparison of different instruments and criteria for selecting an analyzer according to workload, utilization of reagents, technologists available and labour costs with special emphasis on different techniques in Spectrophotometery, Mass spectrometry, Fluorometry, nephelometry, turbidimetry, Electrolyte analyzers, Acid Base & Gas analyzers, Electrophoresis, Chromatography, radioimmunoassays, ELISA and PCR.

Reading material

**CP 703: Carbohydrates, Lipids, Proteins and Enzymes**

Carbohydrates

* Carbohydrate metabolism, maintenance of extra cellular glucose, Hormones concerned with glucose metabolism with special emphasis on Insulin
* Disorders of carbohydrate metabolism, hyperglycemia, diabetes mellitus and hypoglycemia
* Investigation of disorders of carbohydrate metabolism, estimation of glucose in serum and other body fluids, Glycosylated Haemoglobin, Insulin and insulin antibodies
* Inborn errors of metabolism, Glycogen storage diseases

Lipids

* Plasma lipids, lipoprotein metabolism, disorders of lipid metabolism, investigation of lipid disorders
* Analytical techniques available for estimation of Cholesterol, Triglycerides, HDL-C, LDL-C, with special emphasis on standardisation, precision and current recommendations on detection of lipemia
* Problems arising in determination of reference ranges for lipid profile
* Clinical significance of lipoproteins and hyperlipoproteinemia.

Protein

* Plasma Proteins, Inflammatory response, Acute phase proteins
* Immune response, Disorders of B-cells &T-cells
* Immunoglobulins and complement proteins
* Methods of assessing Proteins in serum, urine & other body fluids
* Indications of Protein, albumin & globulin estimation, Protein Electrophoresis normal pattern and changes in disease states

Enzymes

* Assessment of cell damage and proliferation
* Abnormal plasma enzyme activities, enzyme kinetics, enzyme pattern in diseases, with special emphasis on Myocardial infarction, liver and bone diseases
* Estimation of Transaminases, LDH, CK, CKMB, ALP, ACP, GGT, cholinesterase, acid phosphatase and amylase in serum and other body fluids.

Gastrointestinal Tract

* Normal digestion and absorption including Gastric & Pancreatic function
* Special emphasis on differential diagnosis and investigation of Malabsorption Syndrome, Steatorrhoea and failure of absorption of specific substances.

Hepatobiliary System

* Function of Liver, diseases of liver with special emphasis on Hepatitis, Cirrhosis, Cholestasis and liver failure, Bilirubin, Jaundice and metabolic disorders of liver
* Investigations of liver diseases
* Formation and detection of Bile acids and Gall stones.

Kidney

* Renal Physiology, clinical syndromes associated with kidneys
* Acute and chronic renal failure, Uraemia and Nephrotic Syndrome with special emphasis on Pathophysiology and Investigations of renal diseases, oliguria, polyuria, renal calculi
* Urate metabolism, Hyperuricemia, Gout, and Hypouricemia, Clearance studies, dialysis and renal transplantation.

**Reading MATERIAL**

**CP 705: Water, Electrolyte, Acid Base Balance and Blood gases**

Electrolyte and Water Metabolism

* Water and Sodium balance, hormones associated with it i.e. , Aldosterone, Renin-Angiotensin and Antidiuretic hormone
* Relationship between Hydrogen and Potassium ions
* Disturbances & Investigations of water and electrolyte balance, measurement of serum electrolytes and urinary &intestinal losses.

Acid Base Balance and Blood Gases

* Hydrogen ion homeostasis, buffer systems
* Disturbances of hydrogen ion, acid base balance and investigations of Acidosis and Alkalosis
* Blood Gas estimations, Arterial pH and pCO2 estimations

**Reading Material**

**CP 706: Endocrinology**

* General endocrine functions, hormones and their mechanism of action, regulation and receptors
* The endocrine functions and regulation of hypothalamus, pituitary gland, adrenal cortex, thyroid, parathyroid and gonadal hormones
* Assessment of pituitary, adrenal and thyroid functions by dynamic function tests
* Effects of abnormal levels of cortisol, aldosterone, rennin angiotensin, catecholamines, serotonin, thyroid hormones and gonadal hormones including infertility evaluation and assessment in male and female
* Clinical usefulness of urinary free cortisol, testosterone, DHEAS, androstenedione, sensitive TSH and free T4 and T3 tests, stimulation and suppression tests
* Laboratory investigation of patients with hypothyroidism, hyperthyroidism, Cushing’s syndrome, Addison’s disease, Conn’s syndrome, phaeochromocytoma, hirsutism, infertility, congenital adrenal hyperplasia and prolactinoma

**CP 707: Inborn errors of metabolism, Pregnancy and Fetal wellbeing**

Inborn Errors of Metabolism

* General principles of inheritance
* Diseases due to inborn errors of metabolism
* Disorder of amino acid metabolism
* Disorders of carbohydrate & lipid metabolism
* Disorders of transport mechanism and storage defects with special emphasis on clinical importance, diagnosis and screening of inborn errors of metabolism and neonatal screening, techniques for detection of inborn errors of metabolism

Pregnancy and Fetal Wellbeing

* Physiological changes seen in pregnancy
* Role of lab in assessment of fetal lung maturity
* Clinical usefulness of HCG assays in normal pregnancy
* Maternal serum screening for open neural tube defects and Down syndrome including tests for amniotic fluid L/S ratio, AF, serum HCG glucose challenge tests
* Screening guidelines for different diseases.

**CP 708: Tumor Markers**

* Definition, classification and distribution of tumour markers
* Proteins, enzymes, hormones, oncofetal antigens, carbohydrates etc.
* Hormonal effect of tumours in non-endocrine tissues
* Non hormonal peptides as indicators of malignancy
* Desirable features of a tumour marker
* Clinical usefulness and tests for common tumour markers e.g. AFP, CEA, HCG, PSA, PAP, HIAA, HVA, CA125, CA19-9, catecholamines and immunoglobulins

**CP 709: Vitamins, Minerals and Trace Elements**

Calcium, Phosphate and Magnesium metabolism

* Factors effecting total plasma Calcium, Parathyroid hormone, Calcitonin, Vitamin D
* Disorders of Calcium Metabolism, Hypocalcaemia, Hypercalcaemia
* Tests for diagnosis of calcium disorders
* Abnormalities of Phosphate and Magnesium metabolism.

Haem and Iron Metabolism

* Biosynthesis of Haemoglobin
* Disorders of Haem synthesis, various types and investigations of Porphyrias
* Iron metabolism, absorption, excretion and transport, factors effecting plasma iron concentration
* Estimation of serum iron, TIBC, Ferritin and investigation of Anaemia.

**CP 710: Therapeutic drug monitoring and toxicology**

* Basic concepts of monitoring drug treatment
* Factors affecting plasma concentration and its relation with cellular affects
* Indications for measuring drug concentrations to monitor treatment
* Monitoring side effects of drug treatment and investigation of known or suspected over dosage
* Analytical technique, advancements and application, screening procedures for detection of drugs, drugs of abuse e.g. amphetamine, barbiturates, cannabis, cocaine etc.

M.Phil. Hematology courses

**M.Phil. Compulsory Courses**

## FIRST SEMESTER (SPRING, 12 CREDITS)

**COMPULSORY COURSES**

* BMS701- Cell and Molecular Biology (1+1)Credit Hrs
* BMS702 Applied Biostatistics (1+1) Credits Hrs
* BMS703 Communication skills and Health Research (1+1) Credits Hrs
* BMS704 Biosafety and Research Ethics (1+1) Credits Hrs

Total Credits (8 Credit Hours)

**SPECIALITY COURSES**

1. HEM 707:General Pathology (1+1) Credit Hrs
2. HEM 702: Physiology of blood, clotting and immunity (1+1) Credit Hrs

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No. of credit hours 4 Credit Hrs

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**Total no. Of credit hours (12 Credit Hours)**

SECOND SEMESTER (FALL, CREDITS 8 PLUS 4)

**SPECIALITY COURSES**

1. HEM 703:Disorders of Red Blood Cells 1+1 Credit Hrs
2. HEM 704: Disorders of White Blood Cells 1+1 Credit Hrs
3. HEM 705: Bleeding disorders 1+1 Credit Hrs
4. HEM 706: Transfusion Medicine 1+1 Credit Hrs

No. Credit hours 8 credit hours

**ELECTIVE/OPTIONAL COURSES (Any 2, 4 CREDIT HOURS)**

1. BMS 714: Therapeutics in haematology 1+1 Credit Hrs
2. BMS 715: Molecular Haematology 1+1 Credit Hrs
3. BMS 716:Systemic and tropical Haematology 1+1 Credit Hrs
4. BMS 717: Developmental & Neonatal Haematology 1+1 Credit Hrs
5. BMS 718: Immunity 1+1 Credit Hrs

Total no. of credit hours 4 credit hours

**Third and Fourth Semester (6 CREDIT HOURS)**

BMS 799: Research work and thesis writing 6 Cr Hours

Total No. of Credit hours 6 Credit hours

HEM 707: General Pathology

(1+1 Credit Hrs)

# Course Objectives:

Upon completion, of course the students will be able to:

* Comprehend basic knowledge of cell pathology, like cell injuries, death, and various adaptations
* Comprehend general pathological conditions like inflammation, haemodynamic disorders, diseases of immunity and neoplasia
* Apply the knowledge of current research and therapeutic approaches of all these diseases.

# Course Contents:

The course contents of this subject include;reversible and irreversible cell injury, cell death/ necrosis and apoptosis**,** cellular adaptations, intracellular accumulation calcification/ pigmentation. Inflammation,acute inflammation, vascular changes/ mediators, chronic/granulomatous inflammation, repair. Cell cycle, stem cells and wound healing. Thrombosis, shock, oedema haemorrhage, thrombosis embolism, infarction. General features of immune system, cell/ humoral immunity, hyper sensitivity, autoimmune disorders, amyloidoses. Benign/ malignant tumors, epidemiology, carcinogenesis, metastasis, grading/ staging.

## Recommended Readings:

1. Vinay Kumar, Abul K. Abbas, Nelson Fausto, Richard Mitchell. Robbins Basic Pathology. Saunders. Latest Ed.
2. Pathologic Basis of Diseases by Corton, Kumar and Collins, Latest Ed.
3. General Pathology by Walter and Israel Latest Ed.
4. General and Systematic Pathology by Underwood, Latest Ed.

### Journals:

* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* Blood Cells, Molecules and Diseases
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Experimental and Toxicologic Pathology

HEM:702 Physiology of Blood, Blood Clotting & Immunity

(1+1 Credit Hr)

# Course Objectives:

Upon completion of course the students will be able to:

1. Comprehend the composition and general functions of the blood.
2. Demonstrate what blood groups are and have they are determined
3. Comprehend basic understanding immune system and role of blood proteins in body immunity

# Course Contents

The course will include the Composition and general functions of blood, Formed elements of blood and their functions, Haemostasis, Haem synthesis & degradation, Blood groups and hazards of blood transfusion, Functions of plasma proteins, Reticuloendothelial system, Benign Disorders of WBC, Granulocytes, Monocytes, Lymphocytes,

## Recommended Readings:

1. William’s Haematology Latest Ed.
2. Wintrobe’s Clinical Haematology Latest Ed.
3. Postgraduate Haematology Latest Ed. by AV Hoffbrand
4. Practical Haematology by Decie Latest Ed.
5. Colour atlas of Haematology Latest Ed.

### Journals:

1. Blood Reviews
2. Haemophilia
3. Leukemia Research
4. The Journal of Physiology
5. Nature Reviews Immunology
6. Journal of Cellular Physiology
7. Blood Cells, Molecules and Diseases
8. Clinical and Experimental Immunology
9. European Journal of Applied Physiology
10. Seminars in Thrombosis and Homeostasis
11. Canadian Journal of Applied Physiology Reviews

HEM: 703 Disorders of Red Blood Cell

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Describe anaemia and different types of anaemic conditions
* Comprehend the causes of anaemia&adverse effects of anaemia on health & their investigations
* Apply the knowledge of current research and therapeutic approaches towards these diseases.

# Course Contents:

The course contents of this subject include: Basics of haemopoiesis & erythropoiesis, iron homeostasis, Nutritional Anaemia’s including iron Deficiency and megaloblastic Anemia, Bone Marrow Failure syndromes, Dyserythropoietic Anaemia, Iron overloading anemia’s & iron chelation, Disorders of haem synthesis, porphyria’s, lead poisoning and sideroblastic anaemia, Haemolytic anaemia’s i.e hereditary, acquired, immune and non-immune hemolytic anemia’s, Disorders of haemoglobin synthesis, Sickle cell anemia, α & β thalassemia’s, Normal red cell membrane & its disorders, Disorders of red cell metabolism including pyruvate kinase deficiency & glucose 6 phosphate dehydrogenase deficiency, Paroxysmal nocturnal haemoglobinuria(PNH).Presenting signs and symptoms, blood and bone-marrow findings, investigations and interpretation of results, general & specific management of red cell disorders.

## Recommended Readings:

1. William’s Haematology Latest Ed.
2. Wintrobe’s Clinical Haematology Latest Ed.
3. Postgraduate Haematology Latest Ed. by AV Hoffbrand
4. Practical Haematology by Decie Latest Ed.
5. Colour atlas of Haematology Latest Ed.

### Journals:

1. Blood
2. Blood advances
3. Haematologica
4. British Journal of Haematology
5. [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
6. Annals of Hematology
7. Journal of Clinical Pathology
8. Analytical Cellular Pathology
9. [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
10. American Journal of Hematology
11. Blood Cells, Molecules and Diseases
12. [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
13. Critical Reviews in Oncology Hematology

HEM: 704 Disorders of White Blood Cell

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Comprehend various types of benign & malignant white blood celldisorders.
* Differentiate between acute and chronic leukaemia, non-leukaemic, myeloproliferative, lymphoproliferative and myelodysplastic disorders.
* Apply the knowledge of current research in diagnosis and management of these diseases.

# Course Contents:

The course contents of this subject include:Acute, & chronic leukaemia’s, Lymphoblastic & myeloblastic leukemia’s, Chronic lymphocytic leukemia Myelodysplastic syndrome, Myeloproliferative neoplasms, Polycythaemia, Thrombocythaemia, Chronic myeloid leukemia, Myelofibrosis, Classification of Lymphoma’s, Hodgkin/non-Hodgkin, Amyloidosis, Plasma Cell dyscrasia. Presenting signs and symptoms of haematological malignancies, blood and bone-marrow findings, special stains required, specific cytogenetics & immunophenotype results and their interpretation, general & specific management including chemotherapy their dose, route of administration, drug metabolism, interactions &adverse effects. Stem cell transplant including autologous & allogenic transplant.

## Recommended Readings:

1. William’s Haematology Latest Ed.
2. Wintrobe’s Clinical Haematology Latest Ed.
3. Postgraduate Haematology Latest Ed. by AV Hoffbrand
4. Practical Haematology by Decie Latest Ed.
5. Colour atlas of Haematology Latest Ed.
6. Who classification of tumors of haemopoietic and lymphoid tissue Latest Ed by Steven H swerdlow

### Journals:

1. Blood reviews
2. Leukemia research
3. Haematologica
4. British Journal of Haematology
5. Annals of Hematology
6. Nature Reviews Immunology
7. New England journal of medicine
8. American Journal of Hematology
9. Blood Cells, Molecules and Diseases
10. Clinical and Experimental Immunology
11. [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
12. Seminars in Thrombosis and Homeostasis
13. Critical Reviews in Oncology Hematology

HEM: 705 Bleeding disorders

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Describe various bleeding disorder
* Describe thrombosis and its therapy

# Course Contents:

The course contents of this subject include: Bleeding Disorders, inherited and acquired platelet disorders, Hereditary & acquired coagulation disorders, Disseminated intravascular coagulation, Thrombophilia ,Thrombotic thrombocytopenic purpura(TTP) and haemolytic uraemic syndrome (HUS), Thrombosis and Anti Thrombotic Therapy

## Recommended Readings:

* William’s Haematology Last Ed.
* Wintrobe’s Clinical Haematology Last Ed.
* Postgraduate Haematology Last Ed. by AV Hoffbrand
* Practical Haematology by Decie Last Ed.
* Colour atlas of Haematology Last Ed.

### Journals:

* Blood Reviews
* Haemophilia
* Leukemia Research
* Annals of Hematology
* Analytical Cellular Pathology
* Nature Reviews Immunology
* American Journal of Hematology
* Blood Cells, Molecules and Diseases
* Experimental and Molecular Pathology
* Clinical and Experimental Immunology
* Critical Reviews in Oncology Hematology
* Seminars in Thrombosis and Homeostasis

HEM:706Transfusion Medicine

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Understand the basic principals of transfusion.
* Comprehend the clinical transfusion practices.
* Comprehend the complications of transfusion, their prevention & management.

# Course Contents:

The course contents of this subject include: human blood group systems, leucocyte and platelet,antigens, blood donor selection, blood recipients, blood component preparation like red cell concentrate, fresh frozen plasma, cryoprecipitate & platelets, storage and use, prenatal and childhood transfusion & strategies in heamatological disorders, Autologous transfusion, cord blood banking, therapeutic apheresis, Complications of transfusion, Developments in transfusion like blood substitutes, Haemopoietic stem cell processing, storage and transplant, recombinant antibodies, Gene therapy.

## Recommended Readings:

* Practical transfusion medicine Latest edition by Michael F. Murphy
* Modern blood banking & transfusion practices Latest edition by Denise M.Harmening
* William’s Haematology Latest Ed.
* Wintrobe’s Clinical Haematology Latest Ed.
* Postgraduate Haematology Latest Ed. by AV Hoffbrand
* Practical transfusion medicine 2nd Ed by Michael Murphy
* Practical Haematology by Decie Latest Ed.
* Colour atlas of Haematology Latest Ed.

### Journals:

* Transfusion medicine
* Journal of blood transfusion
* Blood transfusion
* Transfusion and apheresis science
* International journal of blood transfusion and immunohematology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* American Journal of Hematology
* Blood Cells, Molecules and Diseases
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Critical Reviews in Oncology Hematology

BMS 714: Therapeutics in hematology (Optional)

(Credit 1+1 hours)

# Course Objectives:

Upon completion of course the students will be able to:

* Discuss the basic principles of iron and vitamins replacement therapy.
* Discuss anti-fibrinolytic agents, antiplatelet agents, pharmacodynamics and pharmacokinetics of anticoagulants & anti-thrombotic agents in detail.
* Explain the principles of pharmacotherapy in haematological malignancies and common adverse effects of drugs used in treating haematology

# Course Contents:

The course contents of this subject include: Overview of nutritional Anaemias, coagulation disorders and haematological malignancies. Principles of Iron, Vit B12, folate and anti-cancer chemotherapy, route of administration, dose, drug/drug interaction, failure of therapy & combination therapy. Management of coagulation disorders, dosage, fresh frozen plasma, Cryoprecipitate, immunoglobulin, recombinant factors. Anti-thrombotic agents, heparin, warfarin, FXa, direct thrombin inhibitors, formulations, mechanism of action, indications/contraindications, adverse effects. Antiplatelet agents, aspirin, clopidogrel, abciximab, dipyradamol. Antifibrinolytic agents, amino caproic acid, fibrinogen, transemic acid. Principles & classification of anti-cancer chemotherapeutic drugs in acute & chronic leukemia’s & lymphoma’s.

## Recommended Readings:

* Post-graduate haematology, Wiley Blackwell, 7th edition (2016)
* Basic and Clinical Pharmacology, A and L Lange, 13th edition (2015)
* Commonly used drugs in haematologic disorders, Elise Anders and Sucha Nand,Elsevier (2014)

### Journals:

* Blood
* Haematologica
* British Journal of Haematology

BMS 715: Molecular hematology (Optional)

(Credit 1+1 hours)

# Course Objectives:

Upon completion of course the students will be able to:

* Comprehend the molecular pathology of haemoglobin.
* Describe cancer stem cells, relate the genetics of Leukaemia and lymphoma and monitor minimal residual disease.
* Discuss molecular basis of iron metabolism, coagulation disorders and blood cell alloantigens.

# Course Contents:

The course contents of this subject include: Structure, genetic control and synthesis of normal haemoglobin, its molecular pathology and structural variants. Genotype – phenotype relationships in thalassaemia, Cancer stem cells clonal evolution, cancer genome, classes of DNA mutations, Pre-natal acquisition of cancer, laboratory diagnosis of genetic mutations in leukaemia, Flow and PCR monitoring of MRD, molecular basis of iron absorption, metabolism, overload, coagulation disorders, platelet disorders, blood group systems, antigens and antibodies.

## Recommended Readings:

* Post-graduate haematology, Wiley Blackwell, 7th edition (2016)
* Moelcular Hematology, Wiley Blackwell, 3rd edition (2010)

### Journals:

* 1.Blood
* 2.Haematologica
* 3.Leukaemia
* 4.British Journal of Haematology

BMS 716: Systemic and Tropical hematology (Optional)

(Credit 1+1 hours)

# Course Objectives:

Upon completion of course the students will:

* Understand tropical diseases and their ethnic variations in reference groups
* Know the tropical diseases with organisms in peripheral blood or bone marrow
* Know the Non Specific hematological abnormalities associated with tropical diseases

# Course Contents

The course will include introduction to tropical diseases, ethinic variations in reference groups, tropical diseases with organisms in peripheral blood or bone marrow: malaria, filariasis, African sleeping sickness, chagas disease, leishmaniasis. Non Specific hematological abnormalities associated with tropical diseases: Hypersplenism,

## Recommended Readings:

* William’s Haematology Last Ed.
* Wintrobe’s Clinical Haematology Last Ed.
* Postgraduate Haematology Last Ed. by AV Hoffbrand
* Practical Haematology by Decie Last Ed.
* Colour atlas of Haematology Last Ed.

### Journals:

* Blood Reviews
* Nature Reviews
* Blood Cells, Molecules and Diseases
* Journal of Tropical medicine
* Asian Pacific Journal of Tropical Medicine
* The American Journal of Tropical Medicine and Hygiene
* Tropical Medicine & International Health
* Tropical Medicine and Infectious Disease

BMS 717: Developmental & Neonatal hematology (Optional)

(Credit 1+1 hours)

# Course Objectives:

Upon completion of course the students will be able to:

* Trace haematopoiesis during embryonic, fetal, early post-natal life & paediatric age groups
* Describe and discuss disorders of the fetomaternal unit, hyper viscosity, polycythaemia, platelet & bleeding disorders and marrow failure.
* Discuss, diagnosis and manage neonatal anaemia’s, immune deficiency disorders & haematological malignancies in the paediatric age group.

# Course Contents:

The course contents of this subject include: Embryonic, fetal and early post-natal haemopoiesis, blood parameters in paediatric population. Neonatal anaemia, Anaemia of prematurity, its Investigation Management. Haemolytic disease of newborn, Fetal blood loss and its placental causes (abruptio placenta, placenta praevia, placental laceration), Transfusion syndromes (Fetomaternal transfusion, fetofetal transfusion), Haematologic effects of maternal diseases, Maternal nutritional deficiencies, New born platelet disorders, hyper viscosity and polycythaemia, bleeding disorders, Paediatric leukaemia, Paediatric immune deficiency disorders, Bone marrow failure syndromes.

## Recommended Readings:

* Post-graduate haematology, Wiley Blackwell, 7th edition (2016)
* Neonatal Haematology, 2nd edition, Cambridge (2005)
* William’s Haematology, 9th edition, McGraw Hill (2016)

### Journals:

* 1.Blood
* 2.Haematologica
* 3.Leukaemia
* 4.British Journal of Haematology

BMS: 718 Immunity (Optional)

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to Comprehend :

* The basic understanding immune system and role of blood proteins in body immunity
* The cellular and molecular biology of the immune system.
* The immune responses to microbial pathogens and other antigenic stimuli

# Course Contents

The course will include differentiation and activation of leukocytes; functions of leukocyte subsets; cell biology of antigen processing and presentation; molecular recognition of antigen; molecular and cellular bases of inflammation; signal transduction in immune cells; characteristics and functions of cytokines; mechanisms of immunoregulation; cellular communication and leukocyte traffic through tissues; production and use of monoclonal antibodies; local immunity at mucosal surfaces; immunity to infectious agents

## Recommended Readings:

* William’s Haematology Last Ed.
* Wintrobe’s Clinical Haematology Last Ed.
* Postgraduate Haematology Last Ed. by AV Hoffbrand
* Practical Haematology by Decie Last Ed.
* Colour atlas of Haematology Last Ed.

### Journals:

* Blood Reviews
* Leukemia Research
* The Journal of Physiology
* Nature Reviews Immunology
* Journal of Cellular Physiology
* Blood Cells, Molecules and Diseases
* Clinical and Experimental Immunology
* European Journal of Applied Physiology

MPhil Histopathology Courses

## FIRST SEMESTER (SPRING, 12 CREDITS)

**COMPULSORY COURSES**

* BMS701- Cell and Molecular Biology (1+1)Credit Hrs
* BMS702 Applied Biostatistics (1+1) Credits Hrs
* BMS703 Communication skills and Health Research (1+1) Credits Hrs
* BMS704 Biosafety and Research Ethics (1+1) Credits Hrs

Total Credits (8 Credit Hours)

**SPECIALITY COURSES**

HIS: 707 General Pathology 1+1 Credit Hrs

HIS: 712 Head and Neck Pathology &cytology 1+1 Credit Hrs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

No. of credit hours 4 Credit Hrs

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**Total no. Of credit hours (12 Credit Hours)**

**Second Semester (Fall, Credits 8 plus 4)**

HIS: 708 Respiratory and Cardiovascular pathology 1+1 Credit Hrs

HIS: 709GIT& hepatopancreatico-biliary pathology 1+1Credit Hrs

HIS: 710Urogenital & breast pathology and cytology 1+1 Credit Hrs

HIS: 711Endocrine and neuro-pathology 1+1 Credit Hrs

Number of Credit Hours 8 Credit Hours

**ELECTIVE/OPTIONAL COURSES (Any 2, 4 credit hours)**

BMS: 719 Lympho-reticular Pathology 1+1 Credit Hrs

BMS: 720 Skin, Soft tissue & Osteo-articular Pathology 1+1 Credit Hrs

BMS: 721Histopathology techniques 1+1 Credit Hrs

BMS: 723 Cancer biomarkers 1+1 Credit Hrs

Total Credits 2nd Semester 12 Credit Hours

**Third and Fourth Semester (6 credit hours)**

799 Research work and Thesis 6+0 Credit Hrs

Number of Credit Hours 6 Credit Hour

HIS: 707 General Pathology

1+1 Credit Hrs

# Course Objectives:

Upon completion, of course the students will be able to:

* Comprehend basic knowledge of cell pathology, like cell injuries, death, and various adaptations
* Comprehend general pathological conditions like inflammation, haemodynamic disorders, diseases of immunity and neoplasia
* Apply the knowledge of current research and therapeutic approaches of all these diseases.

# Course Contents:

The course contents of this subject include;reversible and irreversible cell injury, cell death/ necrosis and apoptosis**,** cellular adaptations, intracellular accumulation calcification/ pigmentation and obesity. Inflammation,acute inflammation, vascular changes/ mediators, chronic/granulomatous inflammation and repair. Cell cycle, stem cells and wound healing. Thrombosis, shock, oedema haemorrhage, thrombosis embolism, infarction and stroke. General features of immune system, cell/ humoral immunity, hyper sensitivity, autoimmune disorders, amyloidoses. Benign/ malignant tumors, epidemiology, carcinogenesis, metastasis, grading and staging.

## Recommended Readings:

* Vinay Kumar, Abul K. Abbas, Nelson Fausto, Richard Mitchell. Robbins Basic Pathology. Saunders. Latest Ed.
* Pathologic Basis of Diseases by Corton, Kumar and Collins, Latest Ed.
* General Pathology by Walter and Israel Latest Ed.
* General and Systematic Pathology by Underwood, Latest Ed.

## Journals:

* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* Blood Cells, Molecules and Diseases
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Experimental and Toxicologic Pathology

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# Learning Outcomes:

The students of MPhil Histopathology/Hematology should be able to,

1. Discuss the basic principles of cellular responses to stress and toxic stimuli.
2. Discuss the causes, events and mechanisms of cell injury and cell death.
3. Define and discuss in detail the principles of necrosis, apoptosis and autophagy.
4. Describe briefly intracellular accumulation and pathologic calcification.
5. Explain cellular aging.
6. Define and discuss inflammation and its types and causes.
7. Trace the process of acute inflammation.
8. Discuss the process of leukocyte migration
9. List the mediators of inflammation and briefly describe their role in acute inflammation.
10. Discuss briefly the morphologic patterns and outcomes of acute inflammation.
11. Discuss the types, principles and process of chronic inflammation.
12. Discuss in brief granulomatous inflammation.
13. Discuss in brief the systemic effects and consequences of inflammation.
14. Discuss the overview oftissue repair.
15. Explain cell and tissue regeneration, repair by scarring
16. Discuss factors that impair tissue repair.
17. Relate clinical examples of abnormal wound healing and scarring.
18. Explain the term stem cells and describe the different types of stem cells. Discuss the controversies surrounding stem cell research
19. Discuss in detail cell cycle. Explain how abnormal cell cycle relates to disease process.
20. Discuss the mechanisms of tissue regeneration
21. Discus the extracellular matrix and cell matrix interactions and their role in normal homeostasis and disease
22. Discuss the etiology and pathogenesis of hyperemia, congestion and edema
23. Discuss morphologic features of hemorrhage.
24. Compare and contrast hyperemia and congestion.
25. Discuss the process of normal homeostasis, thrombosis, embolism and infarction.
26. List the pro-thrombotic and anti-thrombotic factors.
27. Discuss the processes involved in thrombosis and embolism
28. Trace the process of coagulation. Explain disseminated intravascular coagulation
29. Briefly discuss infarction.
30. Discuss the role of biomarkers in diagnosis of infarction.
31. Briefly describe shock.
32. Explain the different types of shock.
33. Relation of shock to various disease states.
34. Relation of pathology of shock with other healthcare fields.
35. Describe the main features of the human genetic architecture.
36. Describe genetic mutations. List the various types of mutations.
37. Explain how genetic mutations can lead to a particular clinical phenotype with examples.
38. Discuss the Mendelian pattern of inheritance and single gene disorders.
39. Discuss the basic principles of single gene disorders (Proteins, enzymes).
40. Discuss the normal immune response of the body.
41. List and discuss cells and tissues of immune system.
42. Discuss overview of lymphocyte activation and adaptive immune responses.
43. Discuss the Human Leukocyte Antigen system
44. Define and discuss hypersensitivity and immunologically mediated tissue injury.
45. Classify hypersensitivity.
46. Discuss the basic principles of hypersensitivity reaction
47. Discuss the basic principles of autoimmune disorders
48. Discuss the principles of transplant rejection
49. Discuss the basic principles of immunodeficiency disorders.
50. Classify immunodeficiency disorders
51. Briefly discuss Acquired Immunodeficiency Syndrome.
52. Explain amyloidosis and relate to disease process.
53. Describe cellular adaptation to stress including hypertrophy, hyperplasia, atrophy and metaplasia
54. Define and discuss neoplasia and its nomenclature.
55. Describe the classification of neoplasia.
56. Discuss the characteristics of benign and malignant tumors.
57. Explain the epidemiology and etiology of tumors.
58. Discuss the process of oncogenesis and hallmarks of cancer.
59. Explain the molecular basis of cancer.
60. Describe carcinogens and discuss their cellular interactions.
61. Discuss the role of immune system in protection from cancers.
62. Discuss the clinical aspects of neoplasia.
63. Explain the general principles of microbial pathogenesis and how they cause disease.
64. Describe the transmission and dissemination of microbes.
65. Explain the immune and inflammatory response to infections.
66. Discuss the role of nutrition in systemic diseases and cancer
67. Explain malnutrition and obesity.
68. Relation of malnutrition and obesity with disease state.
69. Relation of pathology of malnutrition and obesity with other healthcare fields.
70. Describe the role of environment in health and disease.

# Tutor’s distribution:

LO 18-36 – Dr XYZ

LO 37-49 –Dr XYZ

LO 50-59 – Dr XYZ

LO 60-70 – Dr XYZ

# Virtual pathology:

Follow the following link for some of the general pathologies.

* <http://www.pathologyatlas.ro/>
* <http://www.webpathology.com/index.asp>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Slides Session:

There will be dedicated slide sessions for all students on general pathology slides and disease processes informed time to time by course tutors.

Students are encouraged to follow tutors and plan for slide session.The following general pathology slides will be available with special sessions for each one of them,

1. Nodular Thyroid Goitre (FNAC)
2. Multi-nodular Thyroid Goitre
3. Chronic Cholecystitis
4. Adenocarcinoma signet ring type with lymph node metastasis (Stomach)
5. Invasive squamous cell carcinoma oesophagus
6. Clear renal cell carcinoma oesophagus (Trucut Biopsy)
7. Prostate Adenocarcinoma
8. IDC Breast
9. Suspected Adenocarcinoma (Breast FNAC)
10. Tuberculous Lymphadenitis
11. Iron Deficiency Anaemia
12. Microcytic Anemia
13. Eosinophilia
14. AFB ZN Stain

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# Learning Resources:

Robbin’s Pathology 10th Edition, Pathoma Lecture Notes

HIS: 708 Respiratory& Cardiovascular Pathology

(1+1 Credit Hrs)

# Respiratory System

# Course Objectives:

Upon completion, of course the students will be able to:

* Understand the basic knowledge of respiratory system pathology.
* Explain the etiology and pathogenesis of respiratory system diseases.
* Interpret respiratory system cytology and histopathology.
* Analyze special stains related to respiratory diseases.
* Formulate a diagnosis based on morphological patterns.
* Discuss the basic knowledge of diagnosis and treatment of respiratory diseases.
* Understand the basic knowledge of cardiovascular pathology.
* Explain the etiology and pathogenesis of cardiovascular systemdiseases.
* Interpret histopathology of cardiovascular diseases.
* Analyze special stains related tocardiovascular diseases.
* Formulate a diagnosis based on morphological patterns.
* Discuss the basic knowledge of diagnosis and treatment of cardiovascular diseases.

# Course Contents:

The course contents of this subject include; Obstructive pulmonary diseases, pulmonary infections, diffuse interstitial diseases, tumors of lung.The course contents of this subject include; Atherosclerosis, aneurysms, hypertension, stroke, inflammatory disease/ vasculitis, tumors of blood vessels, ischemic heart disease/myocardial diseases

## Recommended Readings:

* Rosai and Ackerman’s Surgical Pathology, 10th Edition
* Modern Surgical Pathology by Weidner et al., Latest Ed.
* Anderson Pathology by Damjanor & Linder Latest Ed.
* Sternberg’s Surgical Pathology, Latest Edition

## Journals:

* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Experimental and Toxicologic Pathology

# Learning Outcomes:

The students of MPhil Histopathology should be able to,

1. Discuss the respiratory system.
2. Describe the normal anatomy and physiology of lung.
3. Explain obstructive lung disease.
4. Classify obstructive lung disease.
5. Explain and interpret the morphology of obstructive lung diseases.
6. Explain emphysema, chronic bronchitis, asthma and bronchiectasis in detail.
7. Discuss and classify chronic diffuse interstitial (restrictive) lung diseases in detail.
8. Explain pathogenesis and morphological patters of chronic diffuse interstitial (restrictive) lung diseases.
9. Classify pulmonary infections.
10. Discuss the gross and microscopic features of pulmonary infections.
11. Describe the molecular genetics, staging, treatment and prognosis of Lung tumours.
12. Classify lung tumours.
13. Interpret the microscopic findings of each type of lung tumour.
14. Explain and discuss diseases of pleura.
15. Define atherosclerosis and arteriosclerosis.
16. Explain pathogenesis of atherosclerosis in detail
17. Discuss the modifiable and non-modifiable risk factors of atherosclerosis.
18. Describe the gross and microscopic morphology of atherosclerosis.
19. Classify aneurysms of blood vessels.
20. Describe the pathogenesis of aneurysms in detail.
21. Describe the morphological (gross + microscopic) picture of aneurysms.
22. Explain aortic dissection in detail.
23. Discuss in detail the hypertensive vascular diseases.
24. Classify vasculitis of blood vessels.
25. Explain in detail non-infectious vasculitis with morphological features
26. Explain in detail infectious vasculitis with morphological features.
27. Classify vascular tumours.
28. Describe in detail the morphological features of vascular tumours in detail.
29. Explain the normal anatomy and physiology of heart.
30. Classify ischemic heart diseases.
31. Discuss in detail the pathogenesis of myocardial infarction.
32. Describe the morphological features present in myocardial infection.
33. Classify heart tumours.
34. Discuss cardiovascular effects of noncardial neoplasms.
35. Describe in detail the morphology of heart tumours.

# Tutor’s distribution:

LO 1-14- Dr XYZ

LO 14-35 Dr XYZ

# Slide Sessions:

There will be dedicated slide sessions for all students on respiratory and cardiovascular pathology.

Students are encouraged to follow tutors and plan for slide session.

## Virtual pathology

Follow the following link for some of the respiratory and cardiovascular pathology.

* <http://www.pathologyatlas.ro/>
* <https://www.pathpedia.com/education/eatlas/histology/respiratory/Images.aspx?6>
* <http://www.webpathology.com/atlas_map.asp?section=16>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Learning Resources:

For learning outcome,

* Lecture notes on lymphoid system and location of immune cells.
* Robbin’s Pathology 10th Edition.
* Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011.

HIS: 709 GIT & Hepato-pancreatico-biliary Pathology

(1+1 Credit Hrs)

# Course Objectives:

Upon completion, of course the students will be able to:

1. Understand the basic knowledge of gastrointestinal system pathology.
2. Explain the etiology and pathogenesis of gastrointestinal system diseases.
3. Interpret gastrointestinal system cytology and histopathology.
4. Analyze special stains related to gastrointestinal diseases.
5. Formulate a diagnosis based on morphological patterns.
6. Discuss the basic knowledge of diagnosis and treatment of gastrointestinal diseases.

# Course Contents:

The course contents of this subject include;Congenital, inflammatory diseases and tumors of esophagus, stomach, small and large intestine, liver/ cirrhosis, viral hepatitis, inborn errors of metabolism, tumors, liver transplant, gallbladder inflammation and tumors, pancreatitis and pancreatic tumors.

## Recommended Readings:

* Rosai and Ackerman’s Surgical Pathology, 10th Edition
* Modern Surgical Pathology by Weidner et al., Latest Ed.
* Surgical Pathology of the GI Tract, Liver, Biliary Tract and Pancreas by [Robert D. Odze](http://www.amazon.com/s/ref=ntt_athr_dp_sr_1?_encoding=UTF8&sort=relevancerank&search-alias=books&field-author=Robert%20D.%20Odze%20MD%20%20FRCP%28C%29) and John R. Goldblum. Saunders. Latest Ed.
* Anderson Pathology by Damjanor & Linder Latest Ed.
* Sternberg’s Surgical Pathology, Latest Edition

### Journals:

1. Pathology
2. Histopathology
3. [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
4. Pathology and Pathobiology
5. Journal of Clinical Pathology
6. Analytical Cellular Pathology
7. [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
8. Canadian Journal of Gastroenterology
9. [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
10. Experimental and Toxicologic Pathology

## 

# Learning Outcomes:

The students of MPhil Histopathology should be able to,

1. Discuss the normal anatomy and physiology of esophagus.
2. Describe obstructive and vascular diseases of esophagus.
3. Explain esophagitis, etiology and pathogenesis.
4. Describe Barrett Esophagus, its pathogenesis, morphology and clinical outcome.
5. Classify tumors of esophagus
6. Interpret and explain the pathogenesis, morphology and clinical presentation of adenocarcinoma of esophagus.
7. Interpret and explain the pathogenesis, morphology and clinical presentation of squamous cell carcinoma of esophagus.
8. Discuss the normal anatomy and physiology of stomach.
9. Describe gastropathy and acute gastritis.
10. Classify and discuss chronic gastritis, its pathogenesis and morphological characteristics.
11. Explain complications of chronic gastritis
12. Discuss gastric polyps and tumours, classify them and interpret their morphology.
13. Discuss the normal anatomy and physiology of intestines and appendix.
14. Describe intestinal obstruction and classify them with explanation.
15. Discuss the vascular disorders of bowel.
16. Explain diarrheal diseases and malabsorption.
17. Discuss inflammatory intestinal diseases with a special focus on inflammatory bowel diseases (IBD).
18. Interpret the morphological characteristics of IBD.
19. Explain colonic polyps and other neoplastic diseases of colon.
20. Interpret the morphological characteristics of colonic polyps and other neoplastic diseases of colon.
21. Discuss acute appendicitis.
22. Explain and interpret (morphology) of tumors of appendix.
23. Discuss the normal anatomy and physiology of liver, gall bladder and pancreas.
24. Describe the general features of liver disease and infectious disorders of liver.
25. Describe autoimmune hepatitis, drug & toxin induced liver injury.
26. Explain alcoholic and non-alcoholic fatty liver.
27. Discuss inherited metabolic liver diseases.
28. Describe cholestatic syndromes and circulator disorders.
29. Interpret (morphology) and explain nodules and tumors of liver.
30. Describe gallstone diseases and cholecystitis.
31. Interpret (morphology) and explain nodules and carcinoma of gallbladder.
32. Describe congenital anomalies of pancreas and pancreatitis
33. Interpret (morphology) and explain pancreatic neoplasms.

# Tutor’s distribution:

LO 1-16- Dr XYZ

LO 17-33 – Dr XYZ

# Slide Sessions:

There will be dedicated slide sessions for all students on lymphoreticular pathology.

Students are encouraged to follow tutors and plan for slide session.

## Virtual pathology

Follow the following link for some of the lymphoreticular pathologies.

* <http://www.pathologyatlas.ro/>
* <http://www.webpathology.com/index.asp>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Learning Resources:

For learning outcome,

* Histology course with anatomy students.
* 1-32 Robbin’s Pathology 10th Edition.Chapter 15, 16 and 17
* Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011.Chapter 11, 14, 15.

HIS: 710 Urogenital & Breast Pathology and Cytology

(1+1 Credit Hrs)

# Course Objectives:

Upon completion, of course the students will be able to:

* Understand the basic knowledge of urinary and genital system pathology.
* Explain the etiology and pathogenesis of urinary and genital system diseases.
* Interpret urinary and genitalsystem cytology and histopathology.
* Analyze special stains related to urinary and genital diseases.
* Formulate a diagnosis based on morphological patterns.
* Discuss the basic knowledge of diagnosis and treatment of urinary and genital diseases.
* Understand the basic knowledge of breast pathology.
* Explain the etiology and pathogenesis of breast diseases.
* Interpret breast cytology and histopathology.
* Analyze special stains related to these diseases.
* Formulate a diagnosis based on morphological patterns.
* Discuss the basic knowledge of diagnosis and treatment of breast diseases.

# Course Contents

The course contents of this subject include;glomerular diseases, tubulo-interstitial diseases**,** pediatrics and adult tumors of the kidney**,** inflammation/ tumors of urinary bladder,prostatitis, hyperplasia and tumors of prostrate. Inflammation and tumorsof cervix**,** uterus and ovaries and breast diseases. Inflammatory, benign proliferative diseases and tumors of breast. Targeted treatment in breast cancer and the significance of ER, PR and HER2.

## Journals:

* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Experimental and Toxicologic Pathology

# Learning Outcomes:

At the end of the course the students of MPhil Histopathology will be able to:

1. Describe normal anatomy and physiology of the kidney
2. Enlist various diseases of the kidney
3. Classify various glomerular diseases of the kidney
4. Describe pathogenesis of glomerular injuries
5. Describe and discuss renal disease leading to nephritic syndrome
6. Describe various types of MPGN
7. Describe and discuss renal disease leading to nephrotic syndrome
8. Classify and describe tubule-interstitial diseases of the kidney
9. Classify and describe renal vascular diseases
10. Describe acute kidney injury
11. Explain the mechanisms of pathogenesis of various diseases of the kidney
12. Explain and interpret the morphology of various renal diseases
13. Classify and describe benign and malignant tumors of the kidney
14. Discuss the gross and microscopic features of renal tumors
15. Explain and interpret the morphology of renal tumors
16. Enlist and describe congenital anomalies of kidneys
17. Describe various diseases of urinary bladder
18. Describe tumors of urinary bladder
19. Explain the mechanisms of pathogenesis of urinary bladder diseases
20. Discuss the gross and microscopic features of urinary bladder diseases
21. Explain and interpret the morphology of urinary bladder tumors
22. Describe and explain diseases of internal and external genitalia of male
23. Explain the cancer diagnosis, staging and management
24. Describe congenital anomalies of male genitalia
25. Describe various diseases and anomalies of female external and internal genitalia
26. Describe benign and malignant tumors of cervix
27. Describe and explain causes and risk factors of cervical cancer
28. Explain mechanism of pathogenesis of cervical cancer
29. Discuss screening protocols for cervical cancer
30. Explain and evaluate cervical cytology
31. Describe staging, treatment and prognosis of cervical cancer
32. Describe various disease conditions of uterus including inflammation, endometriosis, hyperplasia and tumors
33. Discuss various placental disorders
34. Discuss disorders of breast development
35. Discuss clinical presentation of Breast diseases
36. Enumerate Inflammatory disorders of breast diseases
37. Describe acute mastitis
38. Describe duct ectasia
39. Describe fat necrosis
40. Describe Granulomatous mastitis
41. Explain benign epithelial lesions
42. Describe the etiology and pathogenesis of breast cancer
43. Enumerate the types of carcinoma breast and explain each
44. Explain the stromal tumors of the breast

# Tutor’s distribution:

LO 1-15- Dr XYZ

LO 16-22- To be covered by students in class presentations as part of the course

LO 23-22- Dr XYZ

LO 22-44- Dr XYZ

# Slide Sessions:

There will be dedicated slide sessions for all students on Urogenital and Breast pathology and cytology.

Students are encouraged to follow tutors and plan for slide session.

## Virtual pathology

Follow the following link for some of the Urogenital and breast pathologies and cytology.

* <http://www.pathologyatlas.ro/>
* <http://www.webpathology.com/atlas_map.asp?section=16>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <http://www.elearning.virtualpathology.leeds.ac.uk/slide_seminar.php?seminar=0&subject=Lymphoreticular%20Pathology&topic=Normal%20reactive%20lymph%20node&return=Lymphoreticular%20Pathology>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Learning Resources:

* Robbin’s Pathology 10th Edition
* Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011
* Research articles related to the topics

HIS: 711 Endocrine Glands &Neuro Pathology

(1+1 Credit Hrs)

# Course Objectives:

Upon completion, of course the students will be able to:

* Understand the basic knowledge of endocrine glands and neuro pathology.
* Explain the etiology and pathogenesis of endocrine glands and neuro diseases.
* Interpret endocrine glands and neuro cytology and histopathology.
* Analyze special stains related to these diseases.
* Formulate a diagnosis based on morphological patterns.
* Discuss the basic knowledge of diagnosis and treatment of endocrine gland and neuro diseases.
* Understand the basic knowledge of neuropathology.
* Explain the etiology and pathogenesis of neurological diseases.
* Interpret histopathology of neurological diseases.
* Analyze special stains related to neuropathology.
* Formulate a diagnosis based on morphological patterns.
* Discuss the basic knowledge of diagnosis and treatment of neurological diseases.

# Course Contents:

Introduction to endocrine system, endocrine glands diseases and tumors. The course contents of this subject include; intrinsic from metastatic tumors of the brain, benign tumors of the meninges and peripheral nerves, knowledge of the classification of tumors of the central nervous system, understand the value of immunohistochemistry in the diagnosis of CNS tumors. Infectious, metabolic, demyelinating & degenerative diseases of CNS.

## Recommended Readings:

* Rosai and Ackerman’s Surgical Pathology, 10th Edition
* Modern Surgical Pathology by Weidner et al., Latest Ed.
* Anderson Pathology by Damjanor & Linder Latest Ed.
* Sternberg’s Surgical Pathology, Latest Edition
* Rosen breast pathology, Latest Ed.

## Journals:

* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Experimental and Toxicologic Pathology

# Learning Outcomes:

The students of MPhil Histopathology should be able to,

1. Discuss the endocrine system.
2. Describe the normal anatomy and physiology of different endocrine glands.
3. Discuss the pituitary gland.
4. Explain the clinical manifestation of pituitary diseases.
5. Discuss pituitary adenoma and Hyperpituitarism
6. Discuss the gross and microscopic features of typical pituitary adenoma.
7. Classify and discuss each pituitary adenomas.
8. Discuss Hypopituitarism.
9. Describe posterior pituitary syndromes.
10. Enumerate the hypothalamic suprasellar tumors and give a brief account of each.
11. Discuss the synthesis of thyroid hormone.
12. Define and discuss hyperthyroidism.
13. Define and discuss hypothyroidism.
14. Enumerated the different types of thyroiditis and discuss each of them.
15. Discuss Graves’ disease.
16. Define goiter and discuss diffuse and multinodular goiters.
17. Discuss the benign tumor of thyroid gland (Follicular adenoma).
18. Enumerate the malignant neoplasm of thyroid gland.
19. Discuss the genetic alteration in the thyroid neoplasms
20. Describe the gross and microscopic findings of papillary carcinoma.
21. Describe the gross and microscopic findings of follicular carcinoma.
22. Describe the gross and microscopic findings of anaplastic (undifferentiated) carcinoma.
23. Describe the gross and microscopic findings of medullary carcinoma.
24. Discuss thyroglossal cyst.
25. Discuss the functions of parathyroid hormone.
26. Define hyperparathyroidism and discuss its types.
27. Define and discuss hypoparathyroidism.
28. Define diabetes mellitus, how it is diagnosed.
29. Classify diabetes mellitus.
30. Discuss glucose homeostasis.
31. Describe the pathogenesis of Type 1 diabetes mellitus.
32. Describe the pathogenesis of Type 2 diabetes mellitus.
33. Discuss the monogenic forms of diabetes.
34. Discuss the effect of diabetes on pregnancy.
35. Explain the clinical features of diabetes mellitus.
36. Define pancreatic neuroendocrine tumors, enumerate the clinical syndromes associated with these tumors.
37. Discuss hyperinsulinism (Insulinomas).
38. Discuss Zollinger -Ellison Syndrome (Gastrinomas).
39. Explain and discuss adrenocortical hyper function (Hyperadrenalism).
40. Explain and discuss adrenocortical insufficiency.
41. Give an account on adrenocortical neoplasm.
42. Briefly discuss adrenal cysts and adrenal myolipomas.
43. Define and discuss pheochromocytoma.
44. Define multiple endocrine neoplasia syndromes (MEN)
45. Classify MEN and give a brief account of each.
46. Briefly discuss pineal gland and pinealomas.
47. Discuss the cellular pathology of the central nervous system.
48. Define cerebral edema, give a brief account on the pathways of cerebral edema.
49. Define hydrocephalus and briefly discuss its types.
50. Define and briefly discuss herniation of brain.
51. Enumerate the malformations and developmental disorders of CNS.
52. Discuss neural tube defects.
53. Discuss Forebrain anomalies.
54. Discuss posterior fossa anomalies.
55. Discuss syringomyelia and hydromyelia.
56. Give and account about perinatal brain injury.
57. Briefly discuss skull fractures.
58. Discuss parenchymal injuries.
59. Discuss the traumatic vascular injury of CNS.
60. Give a brief account of sequelae of brain trauma.
61. Give a brief account on spinal cord injury.
62. Discuss ischemic cerebrovascular disease.
63. Discuss hypertensive cerebrovascular disease.
64. Discuss in detail intracranial hemorrhage.
65. Define and classify meningitis.
66. Give an account on acute pyogenic meningitis.
67. Give and account on acute focal suppurative infections of brain.
68. Discuss chronic bacterial meningoencephalitis.
69. Discuss viral meningoencephalitis.
70. Discuss fungal meningoencephalitis.
71. Define and discuss prion diseases.
72. Briefly discuss Creutzfeldt-Jakob disease (CJD).
73. Briefly discuss fatal familial insomnia (FFI).
74. Define and classify demyelinating diseases.
75. Define and discuss multiple sclerosis.
76. Define and discuss neuromyelitis optica.
77. Define and discuss acute dissented encephalomyelitis and acute necrotizing hemorrhagic encephalomyelitis.
78. Define and discuss central pontine myelinolysis.
79. Define and classify neurodegenerative diseases.
80. Define and discuss Alzheimer disease.
81. Define and discuss frontotemporal lobar degenerations
82. Define and discuss Parkinson disease.
83. Define and discuss atypical Parkinsonism syndrome.
84. Define and discuss multiple system atrophy.
85. Define and discuss Huntington disease.
86. Define and discuss spinocerebellar degeneration.
87. Define and discuss Amyotrophic lateral sclerosis.
88. Briefly discuss spinal and bulbar muscular atrophy (Kennedy disease).
89. Briefly discuss spinal muscular atrophy.
90. Define and classify genetic metabolic diseases.
91. Define and briefly discuss neuronal storage disease.
92. Define and discuss Leukodystrophies.
93. Define and discuss Mitochondrial Encephalomyopathies.
94. Briefly discuss the effects of vitamin B1 and B12 deficiency on CNS.
95. Briefly discuss the role of hypoglycemia, hyperglycemia and hepatic encephalopathy on CNS.
96. Discuss the toxic disorders of CNS.
97. Enumerate the benign and malignant tumors of CNS.
98. Enumerate gliomas.
99. Describe the gross and microscopic features of Infiltrating Astrocytoma.

100. Describe the gross and microscopic features of Pilocytic Astrocytoma.

101. Describe the gross and microscopic features of Pleomorphic Xanthoastrocytoma.

102. Describe the gross and microscopic features of oligodendroglioma.

103. Describe the gross and microscopic features of ependymoma.

104. Describe the gross and microscopic features of Medulloblastoma.

105. Describe the gross and microscopic features of Atypical teratoid/ Rhabdoid tumor.

106. Describe the gross and microscopic features of Primary CNS lymphoma.

107. Describe the gross and microscopic features of Germ cell tumors.

108. Describe the gross and microscopic features of Meningioma.

109. Briefly discuss paraneoplastic syndromes.

110. Briefly discuss familial tumor syndromes.

# Tutor’s distribution:

LO 1-46- Dr XYZ

LO 47-110- Dr XYZ

# Slide Sessions:

There will be dedicated slide sessions for all students on the endocrine system pathology.

Students are encouraged to follow tutors and plan for slide session.

## Virtual pathology

Follow the following link for some of the lymphoreticular pathologies.

* <http://www.pathologyatlas.ro/>
* <http://www.webpathology.com/atlas_map.asp?section=16>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Learning Resources:

For learning outcome,

* 1- 46- Robbin’s Pathology 10th Edition. Page 1073-1140
* 46 to 110- Robbin’s Pathology 10th Edition. Page 1251-1318
* 6-7- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 29 (Pituitary Gland). Page (2446-2459)
* 10- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 09 (Pituitary Gland). Page (2460-2461)
* 17-23- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 09 (Thyroid gland). Page (487-539)
* 36-38- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 15 (Pancreas and ampullary region). Page (1027-1033)
* 41- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 16 (Adrenal gland). Page (1061-1065)
* 43- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 16 (Adrenal gland). Page (1076-1078)
* 98-103- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 28 (Central Nervous system). Page (2359-2360)
* 104- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 28 (Central Nervous system). Page (2377-2381)
* 105-Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 28 (Central Nervous system). Page (2384-2386)
* 106-Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 28 (Central Nervous system). Page (2400-2403)
* 107-Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 28 (Central Nervous system). Page (2403-2404)
* 108- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 28 (Central Nervous system). Page (2389-2394)

HIS: 712 Head & Neck Pathology and Cytology

(1+1 Credit Hrs)

# Course Objectives:

Upon completion, of course the students should be able to:

* Understand the basic knowledge of head and neck pathology.
* Explain the etiology and pathogenesis of head and neck diseases.
* Interpret head and neck cytology and histopathology.
* Analyze special stains related tohead and neck diseases.
* Formulate a diagnosis based on morphological patterns.
* Discuss the basic knowledge of diagnosis and treatment of head and neck diseases.

# Course Contents:

The course contents of this subject include; inflammatory, non-neoplastic, benign and malignant tumors of oral cavity and oropharynx, mandible and maxilla. Diseases of major and minor salivary glands. Eye and ENT infections, inflammations, neurological diseases and tumours.

## Recommended Readings:

* Rosai and Ackerman’s Surgical Pathology, 10th Edition
* Modern Surgical Pathology by Weidner et al., Latest Ed.
* Anderson Pathology by Damjanor & Linder Latest Ed.
* Sternberg’s Surgical Pathology, Latest Edition

### Journals:

* Tumor Biology
* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* American Journal of Hematology
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Experimental and Toxicologic Pathology

# Learning Outcomes:

The students of M.Phil. Histopathology should be able to,

1. Identify various diseases of the head and Neck region.
2. Recognize the anatomical structures of the head and neck including, facial planes, sinuses, oral and maxillofacial region.
3. Trace the pathways of spread of infection from maxilla and mandible from within and beyond.
4. Describe the etiology and pathophysiology of all the infections in the head and neck region including the oral cavity.
5. Describes and correlate the sign and symptoms with the radiographic findings.
6. Knowledge of the local and intracranial complications that may develop following an infection.
7. Classify the types of osteomyelitis.
8. Describe the etiology,
9. Oral and systemic clinical manifestations of osteomyelitis.
10. Diagnose and differentiate between the various types of osteomyelitis clinically, radio graphically and Histopathologically.
11. Identify and differentiate common bacterial, viral and fungalinfections of the head and neck region involving the oral cavity.
12. Aware of the risks of contamination and cross infection control measures.
13. Describe the structure, life cycle, clinical features, investigations and diagnostic tests for the infections.
14. Differentiate and diagnose different infections on the basis of microscopic features and clinical correlation.
15. Identify various inflammatory and infectious lesions of the salivary glands
16. Describe their etiology, oral and systemic manifestations.
17. Describe the clinical presentations of various salivary gland diseases.
18. Describe and interpret various radiological and histopathological findings
19. Differentiate one condition from the other.
20. Identify various immune mediated disorders of the salivary glands.
21. Describe various diagnostic investigations and their findings that would help them make a diagnosis
22. Classify salivary gland tumors.
23. Describe the clinical course and pathogenesis
24. Describe and interpret the etiology, pathogenesis, radiological and histopathological findings
25. Differentiate the benign from malignant salivary gland tumors
26. Understand and interpretthe grading criteria for mucoepidermoid carcinoma, histologically
27. Demonstrate the role of immune-histochemistry for definitive diagnosis of salivary gland tumors.
28. Classify various immune mediated, ulcerative and vesico-bullous lesions of the head and neck areas.
29. Describe the clinical features, necessary investigations and diagnostic tests for such lesions.
30. Identify the biopsy findings and make a provisional diagnosis.
31. Give differential diagnosis of the epithelial lesions.
32. Identify various pigmented and hematological diseases of the head and neck region on the basis of clinical and histopathological features.
33. Describe the tumors of the head and neck region.
34. Classify benign, pre-malignant and malignant tumors.
35. Explain the clinico-histopathological features.
36. Identify the Osteo-articular diseases involving the head and neck areas.
37. Describe the tumors involving the jaw bones and temporomandibular joint.
38. Associate the clinico-microscopic picture of the lesion to reach a diagnosis.
39. Describe various syndromes of the head and neck region.
40. Explain the clinico radiological features and diagnostic tests for all the syndromes.
41. Analyze special stains related to head and neck diseases.

# Tutor’s distribution:

LO 1-20- Dr. XYZ

LO 21 – 41 – Dr. ABC

# Slide Sessions:

There will be dedicated slide sessions for all students on Head and Neck pathology.

Students are encouraged to follow tutors and plan for slide session.

## Virtual pathology

Follow the following link for some of theHead and Neck pathology.

* <http://www.pathologyatlas.ro/>
* <http://www.pathologyatlas.ro/hematopathology.php>
* <http://www.webpathology.com/atlas_map.asp?section=16>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* https://library.med.utah.edu/WebPath/webpath.html

# Learning Resources:

For learning outcome,

* Oral and Maxillofacial Pathology by Neville 4th Edition.
* Robbin’s Pathology 10th Edition.
* Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011.

BMS: 719 Lympho-reticular Pathology (Optional)

(1+1 Credit Hrs)

# Course Objectives:

Upon completion, of course the students should be able to:

* Understand the basic knowledge of lymphoreticular pathology.
* Explain the etiology and pathogenesis of lymphoreticular diseases.
* Interpret lymphoreticular cytology and histopathology.
* Analyze special stains related tolymphoreticular diseases.
* Formulate a diagnosis based on morphological patterns
* To identify the anatomic regions of the normal lymph node, spleen and thymus
* To Know the relationship between lymph node, spleen and thymus structure and their immunologic functions in the immune system
* To classify major histologic subtypes of the non-Hodgkin's lymphomas and Hodgkin's disease.
* To possess the basic knowledge of diagnosis and treatment of the diseases related to lymph node, spleen and thymus

# Course Contents:

the course contents of this subject include; overview of the lymphoid immune system, lymph node Histopathology, cytology of the lymph node, non-neoplastic diseases of lymph nodes, non- Hodgkin’s lymphomas, Hodgkin’s lymphoma, normal Histopathology and histology of spleen, infectious/inflammatory disorders of spleen, tumors of spleen (hematogenous and vascular neoplasms), non-neoplastic disorders of spleen, normal Histopathology and histology of thymus gland, tumors of thymus.

## Recommended Readings:

* Loachim's lymph node pathology, by Harry L Laochim and L Jeffery Medeiros Latest Ed.
* Illustrated pathology of the spleen By Bridget Wilkins, Dennis Howard Wright Latest Ed.
* Disorders of the spleen, by Richard et al. Latest Ed.
* Thymus Gland pathology; clinical, diagnostic and therapeutic features, By Corrado Lavini latest Ed.
* Modern Surgical Pathology by Weidner et al., Latest Ed.
* Anderson Pathology by Damjanor & Linder Latest Ed.
* Rosai and Ackerman’s Surgical Pathology, 10th Edition

### Journals:

* Tumor Biology
* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)

# Learning Outcomes:

The students of MPhil Histopathology and MPhil Hematology should be able to,

1. Discuss the lymphoreticular system.
2. Describe the normal anatomy and physiology of lymph node.
3. Explain reactive lymphadenitis.
4. Classify reactive lymphadenitis.
5. Explain and interpret the morphology of reactive lymphadenitis.
6. Explain lymph node evaluation and lymph node biopsy including needle biopsy.
7. Describe primary immunodeficiency of lymph nodes.
8. Classify patters of lymph node hyperplasia and explain each one of them in detail.
9. Explain the morphological characteristics of various patters of lymph node hyperplasia.
10. Discuss and classify inflammatory/hyperplastic diseases of lymph node.
11. Explain pathogenesis and morphological patters of inflammatory/hyperplastic diseases of lymph node.
12. Discuss metastatic tumors to lymph node and explain its relationship with TNM staging.
13. Describe malignant lymphoma.
14. Discuss the gross and microscopic features of Hodgkin lymphoma.
15. Interpret the microscopic findings of Hodgkin lymphoma.
16. Describe the molecular genetics, staging, treatment and prognosis of Hodgkin lymphoma.
17. Explain and classify Non-Hodgkin lymphoma.
18. Interpret the microscopic findings of each type of Non-Hodgkin lymphoma.
19. Describe the molecular genetics, staging, treatment and prognosis of Non-Hodgkin lymphoma.
20. Explain and discuss other non-neoplastic lesions of lymph nodes.
21. Describe vascular tumors and tumorlike conditions of lymph nodes.
22. Explain the normal anatomy and physiology of spleen.
23. Discuss congenital anomalies, cysts and inflammation of spleen.
24. Describe hypersplenism, other non-neoplastic disorders.
25. Briefly discuss hematolymphoid tumors and tumor like conditions of spleen.
26. Discuss vascular tumors and metastatic tumors of spleen.
27. Discuss thymus hyperplasia.
28. Explain thymoma and discuss the type, morphology and clinical features of thymoma.

**The following topics will be repeated by the following students once all 28 learning outcomes finish**

* Discuss the gross and microscopic features of Hodgkin lymphoma
* Interpret the microscopic findings of Hodgkin lymphoma
* Describe the molecular genetics, staging, treatment and prognosis of Hodgkin lymphoma
* Explain and classify Non-Hodgkin lymphoma
* Interpret the microscopic findings of each type of Non-Hodgkin lymphoma
* Describe the molecular genetics, staging, treatment and prognosis of Non-Hodgkin lymphoma

# Tutor’s distribution:

LO 1-11- Dr XYZ

LO 12-25- Dr XYZ

LO 26-28- Dr XYZ

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# Slide Sessions:

## Virtual pathology

Follow the following link for some of the lymphoreticular pathologies.

* <http://www.pathologyatlas.ro/>
* <https://www.pathpedia.com/education/eatlas/histology/lymph_node/Images.aspx?6>
* <http://www.pathologyatlas.ro/hematopathology.php>
* <http://www.webpathology.com/atlas_map.asp?section=16>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <http://www.elearning.virtualpathology.leeds.ac.uk/slide_seminar.php?seminar=0&subject=Lymphoreticular%20Pathology&topic=Normal%20reactive%20lymph%20node&return=Lymphoreticular%20Pathology>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Learning Resources:

For learning outcome,

* 1- Lecture notes on lymphoid system and location of immune cells (Page 1-16)2, 3, 4- Robbin’s Pathology 10th Edition. Page 461-463
* 5 to 26- Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011. Chapter 21 (Lymph Nodes, Chapter 22 Spleen) 27, 28- Robin’s pathology 10th Edition. Page 493

BMS: 720 Skin, Soft Tissue and Osteo-articular Pathology (optional)

(1+1 Credit Hrs)

# Skin and Soft tissue

# Course Objectives:

Upon completion, of course the students will be able to:

1. Understand the basic knowledge of skin and soft tissue pathology.
2. Explain the etiology and pathogenesis of skin and soft tissue diseases.
3. Interpret skin and soft tissue cytology and histopathology.
4. Analyze special stains related toskin and soft tissue diseases.
5. Formulate a diagnosis based on morphological patterns.
6. Discuss the basic knowledge of diagnosis and treatment of skin and soft tissue diseases.
7. Understand the basic knowledge of osteo-articular pathology.
8. Explain the etiology and pathogenesis of osteo-articular diseases.
9. Interpret skin and osteo-articularcytology and histopathology.
10. Analyze special stains related toosteo-articular diseases.
11. Formulate a diagnosis based on morphological patterns.
12. Discuss the basic knowledge of diagnosis and treatment of osteo-articular diseases.

# Course Contents:

The course contents of this subject include; inflammatory diseases, vesiculobollous diseases, tumors of skin and skin adnexa. Tumors and tumor like conditions of fibroblast and myofibroblast, peripheral nerves, adipose tissues, blood vessels, smooth muscles, striated muscles and tumors of uncertain types.The course contents of this subject include; metabolic disease, tumor and tumor like lesions of bones. Non-neoplastic, tumors and tumor like conditions of joints.

## Suggested Readings:

1. Rosai and Ackerman’s Surgical Pathology, 10th Edition
2. Modern Surgical Pathology by Weidner et al., Latest Ed.
3. Anderson Pathology by Damjanor & Linder Latest Ed.
4. Sternberg’s Surgical Pathology, Latest Edition
5. Lever’s skin pathology, Latest Ed.
6. Enzinger’s Soft Tissue Pathology, Latest Ed.

## Journals:

1. Pathology
2. Histopathology
3. [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
4. Pathology and Pathobiology
5. Journal of Clinical Pathology
6. Analytical Cellular Pathology
7. [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
8. American Journal of Hematology
9. [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
10. Exp and Toxicologic patho

# Learning Outcomes:

The students of M.Phil. Histopathology should be able to,

1. Discuss in detail disorders of pigmentation and melanocytes.
2. Classify benign epithelial tumors of the skin.
3. Discuss the pathogenesis of benign epithelial tumors.
4. Explain the morphology of benign epithelial tumors.
5. Discuss in detail the premalignant and malignant tumors of the epidermis.
6. Discuss in detail the tumors of dermis.
7. Enumerate conditions involved in acute inflammatory dermatosis.
8. Explain the conditions involved in acute inflammatory dermatosis.
9. Enumerate conditions involved in chronic inflammatory dermatosis.
10. Discuss in detail chronic inflammatory dermatosis.
11. Classify various inflammatory and reactive soft tissue lesions.
12. Explain the etiology.
13. Describe the pathogenesis.
14. Explain the microscopic features and differential diagnosis of the soft tissue lesions.
15. Classify benign and malignant soft tissue tumours.
16. Describe the clinical presentation, histopathological features.
17. Discuss the role of immunohistochemical markers for reaching a definitive diagnosis .
18. Differentiate different tumours from one another on the basis of their features.
19. Describe the prognosis for the respective tumours.
20. Describe the treatment plan for the pathological condition.
21. Understand and identify clinical presentation, radiographical features and histopathological findings of different fibro-osseous lesions.
22. Able to differentiate various fibro osseous lesions clinically, radiographically and histopathologically.
23. Able to order any other relevant investigation to confirm diagnosis.
24. Describe the etiology, clinical presentation and histopathological appearance of metabolic and genetic bone diseases.
25. Differentiate between different types of metabolic and genetic bone diseases.
26. Identify the etiology, pathogenesis, radiographical features, and histopathological varieties with prognosis.
27. Classify the different benign and malignant tumours of the bone and cartilage.
28. Describe the etiology and pathogenesis of the various osteo-articular tumours.
29. Describe the various grading classifications and staging of bone tumors.
30. Describe the role of various Immuno-histochemical markers used for definitive diagnosis of these tumours.
31. Differentiate different tumours on the basis of their histological features and describe the prognosis.

# Tutor’s distribution:

LO 1-10- Dr. XYZ

LO 11-31 Dr. XYZ

# Slide Sessions:

There will be dedicated slide sessions for all students on skin, soft tissues and osteo-articular pathology.

## Virtual pathology

Follow the following link for some of the skin, soft tissues and osteo-articular pathologies.

* <http://www.pathologyatlas.ro/>
* <http://www.pathologyatlas.ro/hematopathology.php>
* <http://www.webpathology.com/atlas_map.asp?section=16>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* https://library.med.utah.edu/WebPath/webpath.html

# Learning Resources:

For learning outcome,

* Lecture notes on lymphoid system and location of immune cells (Page 1-16)

Robbin’s Pathology 10th Edition.

* Rosai and Ackerman’s Surgical Pathology, 10th Ed, 2011.

BMS: 721 Histopathology Techniques (Optional)

(1+1 Credit Hrs)

# Learning Outcomes:

The students of MPhil should be able to,

1. Discuss the general features of histopathology techniques.
2. Explain basic principles of microscopy.
3. Discuss the various part of microscopes.
4. Explain the different types of microscopes.
5. Perform microscopy effectively.
6. Interpret various structures in microscopy.
7. Understand the pathway of tissue processing.
8. Explain the different staining techniques.
9. Describe tissue-grossing principles.
10. Perform grossing of various tissues.
11. Interpret various findings of tissue grossing for different organ systems.
12. Relate the findings of various grossing findings to disease pathology.
13. Discuss the use of various chemicals and reagents used in tissue processing.
14. Explain the importance of various steps in tissue processing.
15. Explain the tissue embedding system.
16. Perform staining e.g., H&E staining.
17. Explain the process of cytology.
18. Discuss the importance of cytology in relation to disease pathology.
19. Perform commonly used cytology techniques.
20. Perform staining of cytology samples.
21. Explain immunohistochemistry-staining technique.
22. Perform immunohistochemistry of available biomarkers.
23. Explain relation of immunostaining with disease condition.
24. Explain In-situ hybridization technique.
25. Explain relation of in-situ hybridization to disease condition.
26. Describe the process of tissue microarray.
27. Explain the importance of tissue microarray in research.
28. Perform tissue microarray.
29. Discuss and describe various special stains used in histopathology.
30. Discuss and describe various special stains used in cytology.
31. Explain the role of PCR in FFPE tissues
32. Discuss the role of various chemical and reagents in histopathology techniques

# Tutor’s distribution

LO 1-10- Dr XYZ

LO 11-20– Dr XYZ

LO 21 to 32 –Dr XYZ

# Slide Sessions:

There will be dedicated slide sessions for all students on pathology slides and disease processes informed time to time by course tutors.

Students are encouraged to follow tutors and plan for slide session.

# Virtual pathology:

Follow the following link for some of the general pathologies.

* <https://www.hindawi.com/journals/dm/2013/517834/>
* <https://www.proteinatlas.org/humanproteome/tissue/stomach>
* <http://www.pathologyatlas.ro/>
* <http://www.webpathology.com/index.asp>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Learning Resources:

For learning outcome,

* Robbin’s Pathology 10th Edition.
* Pathoma Lecture Notes

BMS: 723 Cancer Biomarkers (Optional)

(1+1 Credit Hrs)

# Learning Outcomes:

The students of Mphil should be able to,

1. Discuss and define biomarkers.
2. Classify biomarkers based on molecular biology.
3. Classify biomarkers based on clinical application.
4. Discuss and define cancer related biomarkers.
5. Enlist various biomarkers.
6. Explain the origin of biomarkers.
7. Understand the role of biomarkers in disease pathology.
8. Explain the significance of biomarkers in the field of histopathology.
9. Understand the process of biomarker discovery and validation.
10. Describe the pathway of biomarker from discovery to clinical application.
11. Discuss the role of research biomarkers.
12. Interpret the histo-morphology of various biomarkers in histopathology.
13. Discuss the genetic basis of biomarkers.
14. Explain the advanced and predictive histopathology (e.g. IHC, FISH, RT-PCR) based on bioamrkers.
15. Relate biomarkers to clinical outcomes.
16. Explain the relation of biomarkers to organ and organ systems.
17. Describe the systemic manifestation of a pathological condition in relation to diagnostic and research biomarkers.
18. Manipulate tissue processor and microtome.
19. Interpretation of IHC, FISH and PCR based biomarkers.
20. Explain modified Glasgow prognostic score (mGPS).
21. Interpret the findings of mGPS in relation to clinical outcomes.
22. Discuss the importance of mGPS in relation to different tumours.
23. Formulate a differential diagnosis based on biomarkers.
24. Recommend a final diagnosis based on biomarkers.
25. Interpret various statistical models related to biomarker research.
26. Discuss KP plot.
27. Perform KP plot in SPSS
28. Explain COX regressions
29. Perform COX Regression in SPSS
30. Relate the statistical models to various scoring biomarker criteria.

# Tutor’s distribution:

LO 1-10- Dr XYZ

LO 11-18 – Dr XYZ

LO 19 to 30 –Dr XYZ

# Slide Sessions:

There will be dedicated slide sessions for all students on general pathology slides and disease processes informed time to time by course tutors.

Students are encouraged to follow tutors and plan for slide session.

# Virtual pathology:

Follow the following link for some of the general pathologies.

* <https://www.hindawi.com/journals/dm/2013/517834/>
* <https://www.proteinatlas.org/humanproteome/tissue/stomach>
* <http://www.pathologyatlas.ro/>
* <http://www.webpathology.com/index.asp>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <https://library.med.utah.edu/WebPath/webpath.html>

MPhil Microbiology Courses

## FIRST SEMESTER (SPRING, 12 CREDITS)

**COMPULSORY COURSES**

* BMS701- Cell and Molecular Biology (1+1)Credit Hrs
* BMS702 Applied Biostatistics (1+1) Credits Hrs
* BMS703 Communication skills and Health Research (1+1) Credits Hrs
* BMS704 Biosafety and Research Ethics (1+1) Credits Hrs
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Total Credits (8 Credit Hours)

**SPECIALITY COURSES**

MIC707: General Pathology 1+1 Cr Hour

MIC701: General Microbiology 1+1 Credit Hrs

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No. of credit hours 4 Credit Hrs

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**Total no. Of credit hours (12 Credit Hours)**

**Second Semester (Fall, Credits 8 plus 4)**

MIC: 702 Systemic Bacteriology 1+1 Credit Hrs

MIC: 703 Virology 1+1 Credit Hrs

MIC: 704 Medical Mycology and Parasitology 1+1 Credit Hrs

MIC: 705 Basic Immunology 1+1 Credit Hrs

Number of Credit Hours 8 Credit Hours

**ELECTIVE/OPTIONAL COURSES (Any 2, 4 credit hours)**

MIC 711: Zoonotic diseases 1+1 Credit Hrs

MIC 712: Microbial Genetics 1+1 Credit Hrs

MIC 713: Moelecular Basis of Antimicrobial drugs 1+1 Credit Hrs

MIC 714: Autoimmunity and Immune Disorders 1+1 Credit Hrs

MIC 715: Basic cytology and Cell culture 1+1 Credit Hrs

MIC: 707 General Pathology

# Course Objectives:

Upon completion, of course the students will be able to:

* Comprehend basic knowledge of cell pathology, like cell injuries, death, and various adaptations
* Comprehend general pathological conditions like inflammation, haemodynamic disorders, diseases of immunity and neoplasia
* Apply the knowledge of current research and therapeutic approaches of all these diseases.

# Course Contents:

The course contents of this subject include;reversible and irreversible cell injury, cell death/ necrosis and apoptosis**,** cellular adaptations, intracellular accumulation calcification/ pigmentation and obesity. Inflammation,acute inflammation, vascular changes/ mediators, chronic/granulomatous inflammation and repair. Cell cycle, stem cells and wound healing. Thrombosis, shock, oedema haemorrhage, thrombosis embolism, infarction and stroke. General features of immune system, cell/ humoral immunity, hyper sensitivity, autoimmune disorders, amyloidoses. Benign/ malignant tumors, epidemiology, carcinogenesis, metastasis, grading and staging.

## Recommended Readings:

* Vinay Kumar, Abul K. Abbas, Nelson Fausto, Richard Mitchell. Robbins Basic Pathology. Saunders. Latest Ed.
* Pathologic Basis of Diseases by Corton, Kumar and Collins, Latest Ed.
* General Pathology by Walter and Israel Latest Ed.
* General and Systematic Pathology by Underwood, Latest Ed.

## Journals:

* Pathology
* Histopathology
* [Human Pathology](http://www.sciencedirect.com/science/journal/00468177)
* Pathology and Pathobiology
* Journal of Clinical Pathology
* Analytical Cellular Pathology
* [Annals of Diagnostic Pathology](http://www.sciencedirect.com/science/journal/10929134)
* Blood Cells, Molecules and Diseases
* [Experimental and Molecular Pathology](http://www.sciencedirect.com/science/journal/00144800)
* Experimental and Toxicologic Pathology

# Learning Outcomes:

The students of MPhil Histopathology/Hematology should be able to,

1. Discuss the basic principles of cellular responses to stress and toxic stimuli.
2. Discuss the causes, events and mechanisms of cell injury and cell death.
3. Define and discuss in detail the principles of necrosis, apoptosis and autophagy.
4. Describe briefly intracellular accumulation and pathologic calcification.
5. Explain cellular aging.
6. Define and discuss inflammation and its types and causes.
7. Trace the process of acute inflammation.
8. Discuss the process of leukocyte migration
9. List the mediators of inflammation and briefly describe their role in acute inflammation.
10. Discuss briefly the morphologic patterns and outcomes of acute inflammation.
11. Discuss the types, principles and process of chronic inflammation.
12. Discuss in brief granulomatous inflammation.
13. Discuss in brief the systemic effects and consequences of inflammation.
14. Discuss the overview oftissue repair.
15. Explain cell and tissue regeneration, repair by scarring
16. Discuss factors that impair tissue repair.
17. Relate clinical examples of abnormal wound healing and scarring.
18. Explain the term stem cells and describe the different types of stem cells. Discuss the controversies surrounding stem cell research
19. Discuss in detail cell cycle. Explain how abnormal cell cycle relates to disease process.
20. Discuss the mechanisms of tissue regeneration
21. Discus the extracellular matrix and cell matrix interactions and their role in normal homeostasis and disease
22. Discuss the etiology and pathogenesis of hyperemia, congestion and edema
23. Discuss morphologic features of hemorrhage.
24. Compare and contrast hyperemia and congestion.
25. Discuss the process of normal homeostasis, thrombosis, embolism and infarction.
26. List the pro-thrombotic and anti-thrombotic factors.
27. Discuss the processes involved in thrombosis and embolism
28. Trace the process of coagulation. Explain disseminated intravascular coagulation
29. Briefly discuss infarction.
30. Discuss the role of biomarkers in diagnosis of infarction.
31. Briefly describe shock.
32. Explain the different types of shock.
33. Relation of shock to various disease states.
34. Relation of pathology of shock with other healthcare fields.
35. Describe the main features of the human genetic architecture.
36. Describe genetic mutations. List the various types of mutations.
37. Explain how genetic mutations can lead to a particular clinical phenotype with examples.
38. Discuss the Mendelian pattern of inheritance and single gene disorders.
39. Discuss the basic principles of single gene disorders (Proteins, enzymes).
40. Discuss the normal immune response of the body.
41. List and discuss cells and tissues of immune system.
42. Discuss overview of lymphocyte activation and adaptive immune responses.
43. Discuss the Human Leukocyte Antigen system
44. Define and discuss hypersensitivity and immunologically mediated tissue injury.
45. Classify hypersensitivity.
46. Discuss the basic principles of hypersensitivity reaction
47. Discuss the basic principles of autoimmune disorders
48. Discuss the principles of transplant rejection
49. Discuss the basic principles of immunodeficiency disorders.
50. Classify immunodeficiency disorders
51. Briefly discuss Acquired Immunodeficiency Syndrome.
52. Explain amyloidosis and relate to disease process.
53. Describe cellular adaptation to stress including hypertrophy, hyperplasia, atrophy and metaplasia
54. Define and discuss neoplasia and its nomenclature.
55. Describe the classification of neoplasia.
56. Discuss the characteristics of benign and malignant tumors.
57. Explain the epidemiology and etiology of tumors.
58. Discuss the process of oncogenesis and hallmarks of cancer.
59. Explain the molecular basis of cancer.
60. Describe carcinogens and discuss their cellular interactions.
61. Discuss the role of immune system in protection from cancers.
62. Discuss the clinical aspects of neoplasia.
63. Explain the general principles of microbial pathogenesis and how they cause disease.
64. Describe the transmission and dissemination of microbes.
65. Explain the immune and inflammatory response to infections.
66. Discuss the role of nutrition in systemic diseases and cancer
67. Explain malnutrition and obesity.
68. Relation of malnutrition and obesity with disease state.
69. Relation of pathology of malnutrition and obesity with other healthcare fields.
70. Describe the role of environment in health and disease.

# Tutor’s distribution:

LO 18-36 – Dr XYZ

LO 37-49 –Dr XYZ

LO 50-59 – Dr XYZ

LO 60-70 – Dr XYZ

# Virtual pathology:

Follow the following link for some of the general pathologies.

* <http://www.pathologyatlas.ro/>
* <http://www.webpathology.com/index.asp>
* <https://www.pathpedia.com/education/eatlas/Histopathology.aspx>
* <https://library.med.utah.edu/WebPath/webpath.html>

# Slides Session:

There will be dedicated slide sessions for all students on general pathology slides and disease processes informed time to time by course tutors.

Students are encouraged to follow tutors and plan for slide session.The following general pathology slides will be available with special sessions for each one of them,

1. Nodular Thyroid Goitre (FNAC)
2. Multi-nodular Thyroid Goitre
3. Chronic Cholecystitis
4. Adenocarcinoma signet ring type with lymph node metastasis (Stomach)
5. Invasive squamous cell carcinoma oesophagus
6. Clear renal cell carcinoma oesophagus (Trucut Biopsy)
7. Prostate Adenocarcinoma
8. IDC Breast
9. Suspected Adenocarcinoma (Breast FNAC)
10. Tuberculous Lymphadenitis
11. Iron Deficiency Anaemia
12. Microcytic Anemia
13. Eosinophilia
14. AFB ZN Stain

# Learning Resources:

Robbin’s Pathology 10th Edition, Pathoma Lecture Notes

MIC: 701 General Microbiology

(2+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Comprehend basic knowledge of bacterial structure, function and classification
* Comprehend basic knowledge about the morphology and genetic makeup of bacteria
* Know how bacterial infections take place and how they get resistant to certain antibiotics
* Have full command on various technique related to bacterial sterilization and vaccines

# Course Contents:

The course contents of this subject include: Bacterial Physiology, Classification morphology, metabolism, Growth, genetics, normal flora, Pathogenesis, bacterial resistance, Sterilization Disinfection, Bacterial diagnosis, Antimicrobial agents, Vaccines, hospital acquired infections.

## Recommended readings:

* Medical Microbiology by Greenwood D, R Slack, J Peutherer Latest Ed Churchil Livingstone.
* Medical Microbiology by Mims, Dockrell, Goering, Roitt, Wakelin, Zuckerman Latest Ed. Elsevier.
* Color Atlas and Text book of Diagnostic Microbiology by Koneman, Allen, Janda, Schreckenberger, Winn Jr. Latest Ed. Lippincott Williams & Wilkins.
* Manual of Clinical Microbiology, Latest Ed. by Murray, Baron, Pfaller, Tenover, Yolken, ASM Press USA.
* Foundations in Microbiology by Talaro and Talaro, WCB. Latest Ed
* Microbiology and Immunology by Jawetz, Lewinson Latest Ed
* Cheesbrough, M. Latest Ed Medical Laboratory Manual for Tropical Countries. Microbiology, tropical health technology, Butterworth and Co (pubs) Ltd, Borough Green, Sevenonaks, Kent TN15 8PH.
* Kingsbury, D. T., and G. E. Wagner. Microbiology. Latest Ed, Williams and Wilkins, Baltimore
* Mendel, G. L., R. G. Douglas, J. E. Bennett, Latest Ed. Principles and Practice of Infectious Disease. Churchill Living stone Inc,
* Park, J. E. Latest Ed Park’s textbook of Preventive and Social Medicine. M/S Banarsides Bhanot (pub), 1167, Prem Nagar, Jabalpur, 4820021, India.

## Journals:

* Nature Reviews Microbiology
* Archives and Microbiology
* Cellular Immunology
* Cellular Microbiology
* Critical Reviews in Microbiology
* Journal of Molecular Microbiology and Biotechnology
* Journal of Microbiological Methods

MIC: 702 Systemic Bacteriology

(2+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Comprehend basic knowledge of the systemic clinical bacteriology
* Comprehend understanding of pyogenic infections
* Comprehend knowledge of enteric pathogens, respiratory tract pathogens, pathogens affecting CNS and CVS
* Comprehend basic knowledge of mycobacterial infections
* Comprehend various sexually transmitted diseases and how to avoid them
* Have an understanding of chlamydial and rickettsial infections
* Comprehend zoonotic organisms are and how they spread diseases/infections

# Course Contents:

The course contents of this subject include: Systemic Clinical bacteriology**,** Pyogenic infections**,** Enteric pathogens**,** Respiratory tract pathogens, pathogens affecting CNS and CVS. Mycobacterial infections, Sexually Transmitted diseases (STDs) Chlamydial and Rickettsial infections, hospital acquired infections, re-emerging bacterial infections.

## Recommended readings:

* Medical Microbiology by Greenwood D, R Slack, J Peutherer Latest Ed Churchil Livingstone.
* Medical Microbiology by Mims, Dockrell, Goering, Roitt, Wakelin, Zuckerman Latest Ed. Elsevier.
* Color Atlas and Text book of Diagnostic Microbiology by Koneman, Allen, Janda, Schreckenberger, Winn Jr. Latest Ed. Lippincott Williams & Wilkins.
* Manual of Clinical Microbiology, Latest Ed. by Murray, Baron, Pfaller, Tenover, Yolken, ASM Press USA.
* Foundations in Microbiology by Talaro and Talaro, WCB. Latest Ed
* Microbiology and Immunology by Jawetz, Lewinson Latest Ed
* Cheesbrough, M. Latest Ed Medical Laboratory Manual for Tropical Countries. Microbiology, tropical health technology, Butterworth and Co (pubs) Ltd, Borough Green, Sevenonaks, Kent TN15 8PH.
* Kingsbury, D. T., and G. E. Wagner. Microbiology. Latest Ed, Williams and Wilkins, Baltimore
* Mendel, G. L., R. G. Douglas, J. E. Bennett, Latest Ed. Principles and Practice of Infectious Disease. Churchill Living stone Inc,

## Journals:

* Nature Reviews Microbiology
* Archives and Microbiology
* BMC Infectious Diseases
* Cellular Immunology
* Cellular Microbiology
* Critical Reviews in Microbiology
* Journal of Molecular Microbiology and Biotechnology
* Microbial Pathogenesis

MIC: 703 Virology

(2+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Comprehend basic knowledge of the structure and function of viruses and their classification.
* Comprehend the mechanism of pathogenesis of different viruses..
* Comprehend basic knowledge of emerging viral infections such as HCV, Dengue, AIDS, HFVs, and other important viruses.
* Have sound knowledge of techniques and protocols to diagnose different viral infections
* Comprehend knowledge about the precautionary measures for protection from viral infections.

# Course Contents:

* Introduction to virology: Definition, comparison with prokaryotes, general features of viruses.
* Classification of viruses, Viroids, Virosoids, Infection cycle- at the level of cell.
* Viral Genomes: Linear, Circular, DNA or RNA, Lytic & Latent life cycle, DNA (ds, ss), RNA (+ & - strand) Viral Gene Expression: Early & Late, viral proteome
* Viral Pathogenesis in infected cell, cellular and molecular events.
* Viral Transformation: RNA Transformation Viruses, DNA Transformation Viruses
* Viral Pathogenesis: in the host with reference to antiviral Immunity, immune suppression and Immune Activation, Autoimmunity and virulence.
* Viruses and cancer: Oncogenes and oncogenic viruses
* Management of Virus infections: Transmission, prevention and control
* Applied Virology: Diagnostics, Viral Vectors and Gene Therapy
* Emerging viral infections, Hepatitis, HIV, Dengue etc.

## Recommended readings:

* Medical Microbiology by Greenwood D, R Slack, J Peutherer Latest Ed Churchil Livingstone.
* Medical Microbiology by Mims, Dockrell, Goering, Roitt, Wakelin, Zuckerman Latest Ed. Elsevier.
* Color Atlas and Text book of Diagnostic Microbiology by Koneman, Allen, Janda, Schreckenberger, Winn Jr. Latest Ed. Lippincott Williams & Wilkins.
* Manual of Clinical Microbiology, Latest Ed. by Murray, Baron, Pfaller, Tenover, Yolken, ASM Press USA.
* Microbiology and Immunology by Jawetz, Lewinson Latest Ed
* Cheesbrough, M. Latest Ed Medical Laboratory Manual for Tropical Countries. Microbiology, tropical health technology, Butterworth and Co (pubs) Ltd, Borough Green, Sevenonaks, Kent TN15 8PH.

## Journals:

* Advances in Virus Research
* Nature Reviews Microbiology
* Virology
* Virology Journal ,Journal of Virology

MIC: 704 Medical Mycology and Parasitology

1+1 Credit Hrs

# Course Objectives:

Upon completion of course the students will be able to:

* Comprehend basic knowledge of medical Parasitology and entomology , such as cestodes and nematodes and related infections
* Have comprehensive knowledge of the causes, diagnosis, prevention and treatment of different parasitic diseases

# Course Contents:

* Introduction to parasites and host- parasite relationship. Epidemiology, morphology, life cycle, transmission, pathogenesis, diagnosis and management of the medically important parasites belonging to the following groups:
* Protozoans:
  + Intestinal protozones (Entamoeba histolytica, Giardia lamblia
  + Sexually transmitted protozon (*Trichomonas vaginalis*)
* Free living ameobae (*Niagleria fowleri*)
* Blood parasites (Plasmodium, Toxoplasma)
* Blood & tissue parasites (*Leishmania, Trypanosoma*)
* Helimenths:
  + Nematodes (Ascaris lubricoides, Ancylostoma duedenale, Trichenella spiralis, Trichuris trichiura, Enterobius vermicularis, Wucheraria bancrofti, Dracunculus medinensis
  + Cestodes (Taenia, Ecchinococus, Schistosoma
  + Trematodes (Fasciola)
* Medical Entomology: Medically important arthropods, particularly Insects as vectors of parasites.
* Recent trends in parasites research.

## Recommended readings:

* Microbiology and Immunology by Jawetz, Lewinson Latest Ed
* Medical Parasitology D.R Arora,Brij Bala Arora Third Edition 2010,CBS publications India
* Medical Microbiology by Mims, Dockrell, Goering, Roitt, Wakelin, Zuckerman Latest Ed. Elsevier.
* Medical Microbiology by Greenwood D, R Slack, J Peutherer Latest Ed Churchil Livingstone.
* Manual of Clinical Microbiology, Latest Ed. by Murray, Baron, Pfaller, Tenover, Yolken, ASM Press USA.
* Microbiology by Prescott,Harley,Klein. McGraw Hill pub. (2010)

## Journals:

* Journal of Infectious Diseases
* Nature Reviews Microbiology
* Archives and Microbiology
* Cellular Microbiology
* Critical Reviews in Microbiology
* Journal of Molecular Microbiology and Biotechnology

*(1+1 Credit Hrs)*

1. **Course Objectives:**

Upon completion of course the students will be able to:

* Comprehend basic knowledge of Mycology.
* Comprehend the mechanism of mycoses.
* Comprehend the knowledge of opportunistic infections and of the ways to get rid of them.

1. **Course Contents:**

* Introduction: The occurrence, morphology, development of spores, nutrition & metabolism, symbiotic relations and practical importance of fungi.
* Mycotoxins: Types of Mushroom Poisoning and other Mycotoxins; Impact of exposure to animal and human health to fungal toxins
* Superficial mycoses: Pityriasis Versicolor; Tinea Nigra; Piedra
* Cutaneous mycoses: - various forms of Tinea and their causes, symptoms, and treatment: *Microsporum* spp., *Trichophyton* spp., and *Epidermophyton floccosum*
* Subcutaneous mycoses: Chromoblastomycosis; Phaeohyphomycosis; Sporotrichosis; Lobomycosis; Rhinosporidiosis
* Systemic Mycoses - caused by true pathogenic fungi: Blastomycosis; Paracoccidioidomycosis; Histoplasmosis; Coccidioidomycosis
* Opportunistic Infections - Cryptococcosis; Pseudallescheriasis Aspergillosis; Zygomycosis; Entomophthoromycosis; Geotrichosis, *Pneumocystis carinii*)
  1. **Recommended readings:**
* Medical Microbiology by Greenwood D, R Slack, J Peutherer Latest Ed Churchil Livingstone.
* Medical Microbiology by Mims, Dockrell, Goering, Roitt, Wakelin, Zuckerman Latest Ed. Elsevier..
* Manual of Clinical Microbiology, Latest Ed. by Murray, Baron, Pfaller, Tenover, Yolken, ASM Press USA.
* Cheesbrough, M. Latest Ed Medical Laboratory Manual for Tropical Countries. Microbiology, tropical health technology, Butterworth and Co (pubs) Ltd, Borough Green, Sevenonaks, Kent TN15 8PH.
  1. **Journals:**
* Medical Mycology
* Nature Reviews Microbiology
* Archives and Microbiology
* Cellular Microbiology
* Critical Reviews in Microbiology

MIC: 705 Basic Immunology

(1+0 Credit Hrs)

* Comprehend basic knowledge immune system and its components
* Know Microbial immunology and host responses to invading pathogens
* Know various immunes system disorders, their causes and mechanisms
* To apply immunological techniques.

# Course Contents:

The course contents of this subject include: Immunology, innate and adaptive immune system, structure, function, types of Antigens and structure, functions, types of Antibodies**,** Humeral and cell- mediated immunity**,** complement system**,** Molecular mechanism involved in the host pathogen interactions, Disorders of immune system**,** Hypersensitivity (Allergy) types and their molecular mechanisms**,** Immunodeficiency and autoimmunity.

* **Overview of the immune system:** the need, development, components, external defenses, immune defenses, antigens.
* **Cells of the innate immune system:** phagocytes, NK cells, Mast cells, Basophils, Dendritic cell, other cells.
* **Molecules of the innate immune system:** complement system, interferons, other molecules
* **Antibodies:** Structure, Types, interactions with antigens.
* **The immune response:** humeral immune response, inflammation, cell mediated response, immuno tolerance,
* **Transplantation and histocompatability loci**
* **Vaccination**
* **Disorders of the immune system: i)** hypersensitivity and its types ii) autoimmunity iii) immune deficiency (congenital and acquired), allergy.
* **Immunological tests and techniques**

## Recommended readings:

* Medical Microbiology by Greenwood D, R Slack, J Peutherer Latest Ed Churchil Livingstone.
* Medical Microbiology by Mims, Dockrell, Goering, Roitt, Wakelin, Zuckerman Latest Ed. Elsevier.
* Manual of Clinical Microbiology, Latest Ed. by Murray, Baron, Pfaller, Tenover, Yolken, ASM Press USA.
* Foundations in Microbiology by Talaro and Talaro, WCB. Latest Ed
* Microbiology and Immunology by Jawetz, Lewinson Latest Ed
* Cheesbrough, M. Latest Ed Medical Laboratory Manual for Tropical Countries. Microbiology, tropical health technology, Butterworth and Co (pubs) Ltd, Borough Green, Sevenonaks, Kent TN15 8PH.

## Journals:

* Nature Reviews Immunology
* Cellular Immunology
* Clinical and Experimental Immunology
* Nature Reviews Microbiology
* Archives and Microbiology
* Cellular Microbiology
* Critical Reviews in Microbiology
* Journal of Microbiological Methods

MIC: 711 Zoonotic diseases (Optional)

(2+0 Credit Hrs)

# Course Objectives:

Upon completion of the course the students will be expected to:

* Have basic knowledge of prevalent zoonotic diseases
* Know different diagnostic methods
* Know different management strategies for prevention and control of such diseases
* Contribute technically to the establishment of multidisciplinary research programs

# Course Contents:

* + - * Introduction: Zoonosis Overview
      * Zoonotic infectious diseases - the following aspects of the most common Parasitic (e.g. *Toxoplasma, Leishmania, Echinococcuc*) Bacterial (e.g. *Brucella, Anthrax, Mycobacterium, Salmonella, E. coli*) and Viral (e.g. Rabies, Congo, Influenze, Dengue) infections.
* Classification
* Epidemiology
* Pathogens’ morphology, life cycle, pathogenesis and transmission patterns
* Diagnostic methods (Clinical, Laboratory methods both serological and molecular)
* Health Risks
* Management of Zoonotic infections (from awareness at the individual/community level to cellular/molecular level)
* Impact of Zoonosis on human health
* Research aspects/intervention methods

## Recommended readings:

### Books:

* Human-Animal medicine by Peter M. Rabinowitz
* Handbook of Zoonoses by Joann L. Colville
* Zoonoses vol.III Parasitoses by Pedro N. Acha
* Zoonoses vol.II Clamydioses, Reckettisoses and Viroses by Pedro N. Acha
* Zoonoses vol.I Bacterioses by Pedro N. Acha
* Management of Zoonotic diseases by Inam-ur-Rahim Relief international Publication
* Manual of information and training for health workers Relief international Publication

### Journals:

* Comparative Immunology, Microbiology, Infectious Diseases, Elsevier.
* Research in Veterinary Science, Elsevier
* Veterinary Immunology and immunopathology, Elsevier
* Preventive Veterinary Medicine, Elsevier

MIC 712: Microbial Genetics

1+1

Description

Course content

Assessment methods

Recommended reading

MIC 713: Moelecular Basis of Antimicrobial drugs 1+1 Credit Hrs

MIC: 714 Autoimmunity and Immune Disorders (Optional)

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of course the students will be able to:

* Comprehend basic knowledge immune system and its components
* Know various immunes system disorders, their causes and mechanisms
* To apply immunological techniques.

# Course Contents:

Immunology, structure, types of Antigens and , structure, types of Antibodies**,** Humeral and cell- mediated immunity**,** Complement**,** Disorders of immune system**,** Hypersensitivity (Allergy)**,** Immunodeficiency, autoimmunity.

* **Overview of the immune system:** the need, development, components, external defenses, immune defenses, antigens.
* **Cells of the innate immune system:** phagocytes, NK cells, Mast cells, Basophils, Dendritic cell, other cells.
* **Molecules of the innate immune system:** complement system, interferons, other molecules
* **Antibodies:** Structure, Types, interactions with antigens.
* **The immune response:** humeral immune response, inflammation, cell mediated response, immuno tolerance,
* **Transplantation and histocompatability loci**
* **Vaccination**
* **Disorders of the immune system: i)** hypersensitivity and its types ii) autoimmunity iii) immune deficiency (congenital and acquired), allergy.
* **Immunological tests and techniques**

## Recommended readings:

* Medical Microbiology by Greenwood D, R Slack, J Peutherer Latest Ed Churchil Livingstone.
* Medical Microbiology by Mims, Dockrell, Goering, Roitt, Wakelin, Zuckerman Latest Ed. Elsevier.
* Manual of Clinical Microbiology, Latest Ed. by Murray, Baron, Pfaller, Tenover, Yolken, ASM Press USA.
* Microbiology and Immunology by Jawetz, Lewinson Latest Ed
* Cheesbrough, M. Latest Ed Medical Laboratory Manual for Tropical Countries. Microbiology, tropical health technology, Butterworth and Co (pubs) Ltd, Borough Green, Sevenonaks, Kent TN15 8PH.

## Journals:

* Nature Reviews Immunology
* Cellular Immunology
* Clinical and Experimental Immunology

MIC: 715 Basic cytology and Cell culture (Optional)

(1+1 Credit Hrs)

# Course Objectives:

Upon completion of the course the student will:

* Comprehend basic knowledge cytology ad the use of different types of cells in research
* Know various types of primary cells and cell lines and their growth characteristics
* To apply cytological techniques for the signaling and transfection.
* be able to understand protocols for growing for different advances cytological techniques

# Course contents

The course contents of this subject include: basics of cytology and theoretical knowledge of bout research using eukaryotic cells. Knowledge about the basic structure and functions of different cells used in research. Knowledge of growing normal and abnormal cells including immune cells, epithelial cells, growing cells in specified culture media, tissue growing, stem cells and their growth conditions, organoid growth conditions and uses and other tissue growing conditions. Knowledge about different chemical mediators released by primary cells, tissues and cell lines and their storage. Different techniques applied in cytology including cytogenetics and transfections.

## Recommended readings:

* The cells latest edition
* Cytology latest edition
* Foundations in Microbiology by Talaro and Talaro, WCB. Latest Ed
* Microbiology and Immunology by Jawetz, Lewinson Latest Ed
* Cheesbrough, M. Latest Ed Medical Laboratory Manual for Tropical Countries. Microbiology, tropical health technology, Butterworth and Co (pubs) Ltd, Borough Green, Sevenonaks, Kent TN15 8PH.
* Kingsbury, D. T., and G. E. Wagner. Microbiology. Latest Ed, Williams and Wilkins, Baltimore

### Journals:

* Nature Reviews Immunology
* Cellular Immunology
* Clinical and Experimental Immunology
* Nature Reviews Microbiology
* Archives and Microbiology
* Cellular Microbiology
* Critical Reviews in Microbiology
* Journal of Microbiological Methods

MPhil Oral Pathology

## FIRST SEMESTER (SPRING, 12 CREDITS)

**COMPULSORY COURSES**

* BMS701- Cell and Molecular Biology (1+1)Credit Hrs
* BMS702 Applied Biostatistics (1+1) Credits Hrs
* BMS703 Communication skills and Health Research (1+1) Credits Hrs
* BMS704 Biosafety and Research Ethics (1+1) Credits Hrs

Total Credits (8 Credit Hours)

**SPECIALITY COURSES**

OPT 707: General Pathology 1+1 Credit Hrs

OPT 701: General Microbiology 1+1 Credit Hrs

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No. of credit hours 4 Credit Hrs

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**Total no. Of credit hours (12 Credit Hours)**

**Second Semester (Fall, Credits 8 plus 4)**

**SPECIALITY COURSES**

OPT 703: Head and Neck Anatomy1+0 Credit Hrs

OPT 704: Oral Pathology 2+1 Credit Hrs

OPT 705: Oral Microbiology and Immunology 1+1 Credit Hrs

OPT 706: Histo-cytopathology of head & neck 1+1 Credit Hrs

Total no. Credit hours for Specialty courses 8 credit hours

**OPTIONAL COURSES (Any Two)**

BMS757: Oral Physiology 2+0 Credit Hrs

BMS758: Clinical Pathology 1+1 Credit Hrs

BMS759: Oral Medicine 2+0 Credit Hrs

BMS760: Nutrition and Oral Health 2+0 Credit Hrs

Total no. of credit hours for Fall semester 12 credit Hours

**Third and Fourth Semester (6 CREDIT HOURS)**

BMS 799: Research work and thesis writing 6 Cr Hours

Total No. of Credit hours third and Fourth semester 6 Credit Hours

OPT 707: General Pathology

(2 + 0 Credit Hrs)

This course provides major training in general pathology concepts and is required for all MPhil Oral pathology students. Students will be introduced to the concepts of departures from normal structure and function in the human body, as occurs in disease. The various pathological processes and their importance in the basis of human disease will be studied. Correlation with clinical presentation will also be made.

# Course objectives

On successful completion of this course students should be able to:

* Relate the general principles, terminology, and modes of spread of disease to the study of Systemic Pathology.
* Apply a basic understanding of histopathology and morbid anatomy to the examination of microscopic sections and gross specimens, respectively, displaying pathological processes.
* Apply the diagnostic procedure in pathology, through introduction of the differential diagnostic methods at the clinical level.
* Correlate basic disease states studied at a cellular and gross anatomical level with the overt clinical signs and symptoms seen in those disorders.
* Relate ways in which pathology contributes to the understanding of patient presentation in a clinical setting.

# Course content

The contents of this course include Inflammation and chemical mediators, necrosis & apoptosis, tissue repair/healing, hemorrhage & shock, blood dyscrasias, Tuberculosis & Osteomyelitis, Tissue & Fracture healing, Edema, Hemostasis, Thrombosis & Embolism, Tobacco, Alcohol & its effect, Radiation & its effects, Obesity & Vitamin deficiencies, Definition, classification & nomenclature of neoplasia, Characteristics of benign & malignant tumours, Normal cell cycle & carcinogenesis (multistep).

## Recommended readings (Text books)

* Pathologic basis of disease by Robins & Cotrans, 9th Edition, Elsevier Publications

## Journals, periodicals and web sources

Journal of Clinical Pathology  
The Journal of Pathology

Archives of Pathology and Laboratory Medicine

The American Journal of Pathology

OPT 702: General Microbiology

(2 + 0 Credit Hrs)

An introduction to basic immunology and microbiology with emphasis on understanding the fundamentals of these disciplines: with examples relevant to clinical and diagnostic medicine.

# Course objectives

On successful completion of this course students should have thorough understanding of:

* Classification, structure and function of medically relevant microbes
* The function of the innate and adaptive immune system regulating the defense against microbial infections
* Microbial strategies to evade the immune response of the host organism
* The infection cycle of a number of medically important viruses and bacteria
* Host-pathogen molecular interactions
* How humans defend themselves against infections
* Organization, evolution and function of microbial genomes
* The function, regulation, diversity, adaptation and spreading of virulence factors
* Microbial strategies to regulate the biosynthetic machinery of the host cell
* How to use viral vectors in gene and cancer therapy
* Important transmission routes and how these may be prevented

# Course contents

The course consists of the three partially integrated topics immunology, bacteriology and virology to provide an in-depth knowledge about structure and function of pathogenic virus and bacteria, with emphasis on molecular mechanisms regulating pathogenesis. The host organism’s defence against infection is discussed in detail, as well as the ability of the infecting microbes to evade the immune response. Practical exercises illuminate experimental techniques to study the host cell – microbe interactions.

## Recommended readings (Text books)

Medical microbiology 7th ed. By *Murray, Patrick R.; Rosenthal, Kenneth S.; Pfaller, Michael A.*: Philadelphia: Elsevier Saunders, 2012

Review of Medical Microbiology and Immunology, 13th edition by Warren Levinson

## Journals, periodicals and web sources

Medical Microbiology and Immunology,International Journal of Medical Microbiology

OPT 703: Head and Neck Anatomy

(1 + 0 Credit Hrs)

This course provides a basic understanding of the histologic & anatomic structures of **the head and neck region** and the amazing process of embryonic development. The field of oral histology and embryology and its pertinence to clinical dentistry will be explored.

# Course objectives

Upon successful completion of this course, student will be able to

* State the origin, development, organization, and structure of various cells and tissues of the human body.
* Develop a thorough understanding of the anatomical structures and landmarks of head and neck and orofacial region.
* Identify the tissues that form the human face and neck and describe their function in the developmental process.
* Describe the timely steps in the development of the human face and conclude the possible causes of facial and palatine defects that could occur during the various stages of development.
* Explain what takes place during the various stages of tooth development, eruption, and shedding including possible causes for defects and their clinical effects.
* Apply aspects of tooth and facial development to the possible causes and ramifications related to patients treated in clinic.
* Present a thorough understanding of a histological or embryologic process
* Appreciates the intricate process that occurs during human body formation.

# Course contents

The course contents include; Gross anatomy of the head and neck region including oral structures, oropharynx, sinuses, temporomandibular joint, muscles and bones, blood and nerve supply and the inter-relationship of various structures. Overview of the development of face, neck and orofacial structures, eruption of teeth and microscopy of oral mucosa, gingival and dento-gingival junctional tissues, head and neck structures, enamel, dentin, pulp and periodontium.

## Recommended readings (Text books)

Oral Anatomy, Histology and Embryology by Barry Berkovitz G. Holland, Bernard Moxham published by Mosby, 2009

## Journals, periodicals and web sources

Journal of experimental and clinical anatomy

Archives of oral biology

Cells and Tissue research

OPT 704: Oral Pathology

(2 + 1 Credit Hrs)

The principles of general pathology in relationship to diseases of the teeth, soft tissues and supportingstructures of the oral cavity are the focus of this course. The importance of early recognition ofabnormal conditions in the mouth is emphasized. Inflammation and healing, growth disturbances, bloodand lymph nodes, GI and urinary tracts, the endocrine system and microbiologic diseases will bediscussed.

# Course objectives

Upon successful completion of this course, students are expected to have;

* Knowledge of core pathological processes affecting the body at an organ and particularly the tissue level.
* Detailed knowledge of the pathology and histopathological diagnosis of diseases affecting the teeth, the jaw bones, the oral soft tissues and the salivary glands.
* In-depth clinical perspective to oral disease processes
* Necessary knowledge and skills in relation to tissue handling and processing
* Encourage interdisciplinary management of patients
* To produce oral and maxillofacial pathologists who can ultimately practice unsupervised in oral pathology, contributing to comprehensive, safe and high quality dental (and medical) care, including in the general roles required for routine dental practice and within the ethical standards of the profession and the community.

# Course contents

The course content includes; diseases of the enamel dentine and pulp, periodontium, jaws, oral mucosa and related skin disorders, diseases of the bones and joints of the face, Salivary gland diseases, soft tissue disorders affecting the oral and maxillofacial region, lymphoid and hematological disorders involving the oral and maxillofacial region, genetic and acquired disorders with oral and maxillofacial manifestations, tumors, cysts and other pathological conditions of the head & neck region.

## Recommended readings (Text books)

Oral and Maxillofacial Pathology by Thomas E. Bond, Oral and Maxillofacial Pathology by Brad Neville, Douglas D. Damm , Carl M. Allen, and Jerry Bouquot, Jan 15, 1999

Contemporary Oral and Maxillofacial Pathology by J. Philip Sap, Lewis R. Eversole and George P. Wysocki, Jan 15 1997, Essentials of Oral Pathology and Oral Medicine by R.A. Cawson and E.W. Odell, Oct2, 2002, Oral Pathology by J.V. Soames and J.C. Southam, 1998, Color Atlas of Clinical Oral Pathology by Brad W. Neville, Douglas D. Damm, and Dean K. White, 1999

## Journals, periodicals and web sources

Journal of oral pathology and medicine

British Dental Journal

Journal of Dental Research

OPT 705: Oral Microbiology and Immunology

(1+ 1 Credit Hrs)

This course is designed to increase understanding of microbiological and immunological concepts that are the scientific basis for understanding human responses in health and disease with a particular focus on oral health.

# Course objectives

Upon successful completion of this course, student will be able to;

* Have detailed knowledge of the aerobic and anaerobic bacteria, viruses and fungi present in the oral cavity during health and disease.
* Demonstrate a good understanding of the processes used to study micro-organisms.
* Explain the pathogenic properties and disease characteristics of microbes influencing oral health practice and important to oral health.
* Analyze our understanding of immunological recognition and its significance in the development of disease in humans.
* Explore human immunological responses in inflammation and immunity.
* Analyze the role of microorganisms in health and disease with an emphasis on their role in oral diseases.
* Analyze how theories of oral ecology have been shaped in the last two decades.
* Explore interventions for the control of microbes associated with oral diseases.
* Understand the molecular basis of host-pathogen interaction in oral infections.
* Explain the role infection control plays in managing the spread of infection in clinical practice

# Course contents

Basic oral bacteriology, mycology and virology, Growth and Culturing (cultivation of bacteria: types of solid and liquid media; methods of anaerobic cultivation; the isolation of pure cultures; nutrition of micro-organisms including energy sources and growth factors; environmental requirements including temperature, pH and oxygen); Control of Growth (reproduction and growth: the growth cycle of bacteria; measurement of growth; principles of heat sterilisation including moist heat, dry heat, drying and freezing; antimicrobial chemical agents including characteristics of an ideal disinfectant and factors affecting disinfectant potency; antibiotics including their mode of action, types, and methods of testing antibiotics); Microbial Genetics (structure and function of genetic material: regulation of gene expression: mutation: gene transfer and recombination); Principles of Disease & Epidemiology (interactions between microbes and humans: a description of the various antimicrobial defences of the host; the normal flora of the body; Kochs postulates); Mechanisms of Pathogenicity (pathogens, virulence and infection: pathogenesis of disease; factors influencing infection and virulence); # Immunology (antigens, antibodies and Immunity: an introductory description of antibodies and antigens and the types of immunity); Micro-organisms of medical importance: a description of several micro-organisms and the diseases they cause in humans. Application of microbiology to dental practice: microorganism classes of specific relevance to the common oral diseases of gingivitis, periodontitis and dental caries; infection control.

## Recommended readings (Text books)

Oral Microbiology and Immunolgy, 2nd Edition by R.J. Lamont, George N. Hagishengallis, Howard F. Jenkinson, 2nd edition

## Journals, periodicals and web sources

Oral Microbiology and Immunology,

Journal of oral microbiology

Molecular oral microbiology

OPT 706: Histopathology and Cytopathology

(1+ 1 Credit Hrs)

Histopathology and Cytopathology are key disciplines of Anatomical Pathology. This course provides a sound understanding of histopathology and cytopathology as medical science disciplines. The role of diagnostic laboratories in the diagnosis of various disease states and in patient care and management will be covered. This course facilitates students to develop understanding of the microscopic structure, organization and function of human cells and tissues in health and disease, and develop expertise in the techniques used for their microscopic study. It will also provide an introduction for the further systematic study of histopathology and cytopathology disciplines.

This course focuses on developing theoretical knowledge and practical skills required for histopathological techniques and cytological interpretation and diagnosis in a variety of specimens.

# Course objectives

Upon successful completion of this course, student will be able to;

1. Recognize and describe the regulatory and safety procedures for specimen reception, identification and handling in anatomical pathology. This includes the understanding of quality assurance and quality control measures in Anatomical pathology laboratories.
2. Discuss and explain the principles of and perform: fixation, microtomy and various staining techniques for histopathological specimens.  This includes the selection and application of immunohistochemical methods.
3. Relate the knowledge of the principles and procedures involved in the collection, processing, cytopreparation, screening, interpretation and reporting of common cytology specimens. This includes the use of ancillary testing, to different cytoathological diagnosis.
4. Relate basic knowledge to the aetiology, pathogenesis, pathology, histology and cytology to Interpret and describe the morphological features found in cytology specimens

# Course contents

Histopathology: The principles and aims of histological preparation including: technical faults, fixation of cells and tissues, processing of specimens, microtomy,  staining via various routine and specialised methods for light microscopy, and the rationale and application of immunohistochemical staining

Cytopathology: gynaecological and non-gynaecological cytology covering the pathology and cytological diagnosis of normal, benign, premalignant and malignant conditions in cervical, respiratory and effusion specimens. The theory of fine needle aspiration cytology, cancillary testing and quality control in the cytopathology laboratory will also be covered.

## Recommended readings (Text books)

Bancroft JD, Gamble M. Theory and practice of histological techniques. London: Churchill Livingstone, 6th ed, 2008.

## Journals, periodicals and web sources Journal of Histotechnology  American Journal of Pathology

Journal of Histochemistry and Cytochemistry

Journal of Pathology   
Biotechnic and Histochemistry

BMS 757: Oral Physiology

(2 + 0 Credit Hrs)

Oral cavity itself is a system consisting of the teeth, the tongue, the oral and the perioral muscular, soft tissue and glandular components which work harmoniously to cater various functions. The major functions include Mastication, Speech and Taste Sensation and Production & Regulation of saliva. This course helps you in unveiling the mysteries of these fascinating processes.

# Course objectives

Upon successful completion of this course, student will be able to;

* Understands the basic physiological functions of orofacial systems.
* Relate physiological principles to clinical dentistry and understand the signs, symptoms, pathology and treatment of dental disease based upon a thorough knowledge of oral physiology.
* Have appropriate knowledge of oral physiology required for a thorough understanding of dental anesthesia, oral medicine, oral pathology, oral surgery, and pharmacology & therapeutics.

# Course content

The course of study involves: sensory physiology and pain; motor neurophysiology and the control of mandibular movement; salivary physiology; bone turnover and tooth movement; and the growth, development and healing of oral structures.

## Recommended readings (Text books):

Guyton, A.C. textbook of Medical Physiology, Saunders.

Bradley, R.M. *Essentials of Oral Physiology*, Mosby, Toronto, 1995.

Junge, D. *Oral Sensorimotor Function*, Medico Dental Media International, John S. Swift Company, St. Louis, 1998.

Lavelle, C.L.B. *Applied Oral Physiology*, 2nd edition, Wright, Toronto, 1988.

## Journals, periodicals and web sources

Archives of oral biology

BMS 758: Clinical Pathology

(1 + 1 Credit Hrs)

The student will be exposed to the field of Laboratory Medicine through a variety of media. These include case conferences, laboratory rotations, and didactic sessions with pathology faculty. The student will work with the course director to tailor the teaching objectives of this elective. This course is intended for those students who are considering a career in Pathology.

# Course objectives

* Describe laboratory tests including test methodology and medical use.
* Provide basic interpretation of laboratory test results for tests.
* Research, develop, and present a laboratory medicine case study, with relevant clinicopathologic correlation, at Clinical Pathology case conference.
* Understand and describe the role of pathologists as directors of clinical laboratories and consultants in the arena of laboratory medicine.

# Course content

Clinicopathologic aspects of bacteriology, mycology, serology, mycobacteriology, parasitology, antibiotic testing, special microbiology, diagnostic immunology methods, and virology will be discussed. In addition, Clinical Biochemistry and Hematology will also be part of the course.

## Recommended readings (Text books)

* Robbins Pathological basis of disease. By Ramzi S.Cortan. Vinay Kumar Stanley L. Robbins.
* General Pathology. J.B. Watter, M.S Israel
* Text book of histopathology : Maximow and Bloom

## Journals, periodicals and web sources

* American Journal of Surgical Pathology.
* Achieves of Pathology.
* International Journal of Cancer

BMS 759: Oral Medicine

(2 + 0 Credit Hrs)

This continuing education course is specifically designed for the dentist who wishes to gain a scientific background and additional training in the practice of oral medicine.

# Course objectives

The objective of this course is to enable students to acquire the clinical skills required for the diagnosis and management of primary and secondary diseases affecting the Oral and para-oral structures. Specific objectives include:

* The ability to obtain and evaluate the patient’s dental and medical history and to perform a complete systemic examination of the oral and peri-oral tissues.
* The ability to recognize and thoroughly describe the deviations from normal and to establish a working diagnosis based on a differential diagnosis.
* The ability to select and use appropriate investigations and consultations needed to determine the treatment required and to rationalized different treatment considerations i.e. the need for emergency dental care, medications, referral and follow-up
* Understand and correlate systemic disease with oral manifestations.

# Course content

The course content includes; Red and white lesions of oral cavity, exophytic lesions, salivary gland diseases, Vesiculobullous lesions, orofacial pain, dental management of patients treated with radiotherapy and chemotherapy, dental management of patients with systemic diseases, Aids, Endocrine disorders and their oral manifestations.

## Recommended readings (Text books)

Burket’s oral medicine Diagnosis and treatment 11th edition

“Differerntial diagnosis of oral lesions” By Wood and Goaz 5th edition

“Principles and practice of oral medicine” Sonis and others- Saunders co 2ndedition (1995)

## Journals, periodicals and web sources

Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology

Journal of oral and maxillofacial surgery

Journal of dental research

BMS760: Nutrition and Oral Health

(2 + 0 Credit Hrs)

As dental professionals, we frequently come in contact with patients.  This places us in an ideal position to provide nutritional information to our patients so they may better assess their dietary choices. This course is designed to impart basic understanding of nutrition and how it helps maintain a healthy oral cavity. In addition, deficiency states of various nutritional elements and their oral manifestations are also discussed.

# Course objectives

Upon successful completion of this course, student will be able to;

* Classify carbohydrates, proteins, fats, and the role they play in the oral cavity.
* Identify the function of vitamins, minerals, and antioxidants and symptoms of excesses or deficits.
* Recognize specific nutrient requirements during the human life cycle.
* Identify the Dietary Guidelines for our community.
* Recognize the relationship between nutritional deficiencies and oral disease.
* Assess nutritional aspects of dental caries, its causes, and prevention.
* Guide the patient to clarify and understand his or her own diet-dental relationship.
* Apply basic nutritional concepts to help patients with nutritional problems

# Course content

Contents of this course include; dietary guidelines, major nutrients such as carbohydrates, proteins and lipids. Vitamins, minerals, electrolytes, antioxidants, dietary implications of dental caries, dietary considerations for the dental patients (pregnancy, infants and toddlers, teenagers, adults, elderly), nutritional consultation in the dental practice.

Annexure 1

MPhil Student Progress review Form

**Annual MPhil Student Review Form**

**(To be submitted to Dean IPDM at the end of every review)**

**Section A: General Student Information**

This section is to be completed by the Student

Session:

Student name:

Registration number:

Start date:

Year/Semester of study:

Supervisor names

Supervisor 1:

Supervisor 2:

Department:

Thesis title:

**Section B: Student self-assessment**

This section is to be completed by the student.

1. Please provide a brief description of the written work you have submitted for the progress review as directed by your supervisor (e.g. presentation, draft chapter of thesis, literature review.

*……………………………………………………………………………………………………………….…………………………………………………………………………………………………………*

2. Please provide a paragraph, giving an assessment of your progress in relation to your research and general development in the most recent session.

3. Please provide an update of training and development activity you have undertaken in the most recent session for the purposes of your research and for your professional development, referring to any training needs identified at the beginning of the year.

4. Have you and/or your supervisors identified any issues which are affecting your progress? (e.g. skills gaps, facilities/equipment available, etc). If yes, please give details of the issues identified and how these will be resolved.

5. Please describe your supervisory arrangements. (You may wish to refer to frequency of contact, timing and content of feedback on your work etc.)

6. Please provide a summary of the objectives you and your supervisory team have agreed for the coming session? (e.g. fieldwork, written work, publication, thesis submission, conference attendance, project management training etc. Please give details of nature, volume and deadlines as appropriate)

7. Are there any training or development opportunities not currently provided that you would find useful? If so, please specify.

8. If you wish to make any other comments about your experience as a research student within the Graduate School, you may do so here – or separately, and confidentially, to the Graduate School Office.

Signature of student ……………………………………………………. Date ……………………..

**Section C: Supervisors’ report**

This section is to be completed by the principal supervisor and any co-supervisors who have a significant and regular contact with the student. The student should also sign this section to indicate that he/she has received and read a copy of the Supervisor’s report.

1. Are you in regular contact with the student? Please give approximate frequency, nature (e.g. email, face to face, telephone) and extent of your contact with the student.

Supervisor 1:

Supervisor 2:

2. What training or development activity have you recommended to facilitate the student’s progress in the most recent session? (e.g. presentation or attendance at internal or external seminars, colloquia, conferences, fieldwork trips, submission of written work, project management training, academic writing etc.).

3. Have you identified any issues affecting the student’s progress in the past session? If yes, please specify how these have been managed and give an assessment of the outcome.

6. Please rank the student’s progress by ticking one of the following:

Excellent ❑ Very Good ❑ Good ❑ Adequate ❑ Unsatisfactory ❑

Please use the space below to provide more detail of your assessment. ***If you assess the student’s progress to be unsatisfactory, a reason must be given*** (for final year students please include an assessment of the student’s ability to submit according to their submission schedule)

**Supervisor Statement**

We the supervisors of the above-named student confirm that the above assessment of the student’s progress follows a review with the student of their performance over the past year.

***Supervisor 1***

Signed:

Date:

***Supervisor 2***

Signed:

Date:

**Student statement**

***Please do not sign this section until the supervisors section has been completed, signed and dated***

I confirm that I have met with my Supervisors to discuss the content of this Review Report ❑

I confirm that I have received and read my Supervisors’ assessment of my progress and their recommendations as provided in Section C of this form. ❑

I confirm that the details concerning my personal, degree and submission date information as provided in Section A of this form is accurate and up to date. ❑

Signed:

Name:

Date:

**Section D: Review panel recommendation (To be done with Review 3 only)**

This section is to be completed by the members of Graduate studies committee and relevant subject experts following the GSC meeting (File of the student will be submitted to the ASRB for approval of thesis defense)

Date of Review

Please provide details of the format of the review meeting and the membership of the review panel below:

Please attach the formal note of the review panel meeting including relevant feedback to the student and supervisor.

Formal note attached ❑

***Please tick the appropriate box, supplying additional information where required***

We recommend that the student be permitted to register for the submission of thesis ❑

(no further action required)

We recommend that the student be permitted for the submission of thesis ❑

subject to the following conditions (minor action required)

Provide details and attach documentation as appropriate

We DO NOT recommend that the student be permitted proceed durther unless the ❑

following substantial action is taken

Provide details and attach full documentation as appropriate

We recommend that the student be excluded from further study ❑

***(Please attach all relevant documentation to support this recommendation)***

**Dean IPDM**

Signed:

Name:

Date:

**Review Panel Member 1**

Signed:

Name:

Date:

**Review Panel Member 2**

Signed:

Name:

Date:

**Review Panel Member 3**

Signed:

Name:

Date:

**Review Panel Member 4**

Signed:

Name:

Date:

**Review Panel Member 5**

Signed:

Name:

Date:

Annexure II

Thesis writing guidelines

**Thesis Guidelines Handbook**



For

**MPhil**

**/PhD Program**

**Institute of Pathology & Diagnostic Medicine**

**Khyber Medical University**

**Peshawar**

**Guidelines for Thesis Writing**

1. **A thesis should comprise of the following components**
   1. Title pages 1&2
   2. Dedication (optional)
   3. Certificate
   4. Declaration
   5. Acknowledgements (One page only)
   6. Abstract
   7. Table of contents
   8. List of tables (if there)
   9. List of figures (if there)
   10. List of abbreviations
   11. Chapter 1: Introduction
   12. Chapter 2: Materials and Methods
   13. Chapter 3: Results
   14. Chapter 4: Discussion
   15. Conclusion (One page only)
   16. References (Harvard style/Vancouver)
   17. Appendices (Optional)
2. **General guidelines for thesis writing and binding**
   1. Page size should be A4, with 1inch margins on the top, bottom and right side while 1.5 inches on left side.
   2. All the pages from abstract to dedication should be numbered as in lower case Roman numerals (i,ii,iii…).
   3. All pages starting from introduction to the end of the thesis should be numbered in Arabic numeral (1,2,3…).
   4. Page numbers should appear on the centre bottom of the page.
   5. Chapter number and respective chapter title should be written on the page header in the centre for example 1-Introduction.
   6. Time New Roman or Calibri script should be used for writing thesis.
   7. All the headings should be written in bold face.
   8. Major headings should appear centered all in capitals (16pt).
   9. First order headings should be left aligned (14pt).
   10. Second order headings should be left aligned (12pt).
   11. Third order headings should be left aligned and italicized (12pt)
   12. Font size should be 12pt in main body text and 10pt for table & figure legends.
   13. Line spacing should be 1.5 and 6pt (before and after) between the paragraphs.
   14. Thesis should be printed on one side of a good quality paper at least 70g and bound in soft (strip binding) to be sent for external review.
   15. All prints should be taken on portrait format and use of landscape format should be avoided but if used should not be numbered though the number shall be counted.
   16. At the time of submission for review the thesis must be final in all aspects except the hard binding and incorporation of any amendments as required by the examiner(s).
   17. Final hard bound copy should be in black in case of MPhil and Maroon in case of PhD with golden writing. The contents in covering front board should be the same as presented in the covering page of thesis in soft binding.
   18. The spine of the thesis should carry name of the scholar, name of the degree and year.
   19. The title of the thesis should be exactly the same in all aspects as approved and notified by the AS&RB.
   20. The final copy of thesis (after viva examination) should be duly signed by all the concerned.

Thesis Title (Font 20, Regular)

*Student Name* (*14, Italics)*

Registration Number (14 regular)

MPhil/PhD Thesis

Histopathology (18, Regular)

Institute of Pathology & Diagnostic Medicine

Khyber Medical University

Peshawar (16, Regular)

Month Year (14, Regular)



Thesis Title (Font 20, Regular)

A thesis submitted in the partial fulfillment of the requirement for the degree of (14, Regular)

Master/Doctor of Philosophy

in

Histopathology (16 Regular)

*Student Name (14, Italics)*

Registration Number (14 regular)

Institute of Pathology & Diagnostic Medicine

Khyber Medical University

Peshawar (16, Regular)

Month Year (14, Regular)



**CERTIFICATE**

This thesis by **xxxxxxx** is accepted in its present form, by the Department of Histopathology, Institute of Pathology and Diagnostic Medicine, Khyber Medical University Peshawar, as satisfying thesis requirements for award of degree of Master of Philosophy in Histopathology.

Supervisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Dr. xxxx)

Co-Supervisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Dr. xxx)

External Examiner: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Dr…………………...)

Director: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Prof. Dr. xxx)

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**DEDICATION (Optional)**

This is dedicated to my parents who always guided, supported and helped me to complete my M Phil program. This success is achieved because of my parents’ prayers. Without their support I would have unable to achieve anything. I thank Allah Almighty for blessing me with such kind and loving parents.

**DECLARATION**

I hereby declare that the work accomplished in this thesis is my own research effort carried out in Gastroenterology and Pathology Departments of Hayatabad Medical Complex Peshawar and Institute of Pathology and Diagnostic Medicine, Khyber Medical University Peshawar. The thesis has been written and composed by me.

The work in this thesis has neither been previously submitted for examination leading to the award of a degree nor does it contains any material from the published resources that can be considered as the violation of the international copyright law.

I also declare that I am aware of the terms ‘copyright’ and ‘plagiarism’. I will be solely responsible for the consequences of violation to these rules (if any) found in the thesis. The thesis has been checked for plagiarism by turnitin software.

Name: xxxxx

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_

Date: May 12, 2014

**ABSTRACT**

**ACKNOWLEDGMENT**

Thanks to Allah, Almighty for all his blessing on me throughout my life and who enable me to complete my thesis because of His blessing I am able to achieve this goal. I sincerely pay my humble and heartedly thanks to my most affectionate parents who supported and encouraged me throughout my life time in completing my education. My success is fruit of their devoted prayers.

I am deeply obliged to my supervisor Dr xxxxxx who guided me during my research and thesis. His keen interest and valuable suggestions made this work to end. Thanks to my co supervisor Dr xxxxx Histopathologist at Hayatabad medical complex Peshawar who gave his expert opinion regarding gastric biopsy and to all laboratory staff at Hayatabad medical complex Peshawar.

I would like to thanks to senior registrars Dr xxxx and Dr xxx gastroenterologist at Hayatabad Medical complex, Peshawar who help in providing gastric biopsies of concern cases and also to the trainee medical officers Dr xx, Dr xx, Dr xx and Dr xx who helped me in providing gastric biopsies and endoscopic findings.

I am also thankful to xxxx who is master in statistics and gold medalist she gave her precious time to calculate statistical analysis regarding thesis.

xxxxx

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**LIST OF ABBREVIATIONS**

α Alpha (12, regular)

β Beta

**1 INTRODUCTION (Centered, 16 Bold)**

**1.1 Dyspepsia (left aligned, 14 bold)**

In this chapter, clearly state what the purpose of the study is and explain the study's significance. The significance is addressed by discussing how the study adds to the theoretical body of knowledge in the field and the study's practical significance for communication professionals in the field being examined.

Ph.D. students also must explain how their research makes an original contribution to the body of knowledge in their discipline. They also should address the significance of the study for mass communication education.

Before writing introduction in the thesis, the student should study relevant literature retrieved from published papers. Only pertinent references are cited but not extensively reviewed in this section. Rationale of the study should be mentioned at the end of introduction.Without a clearly defined purpose and strong theoretical grounding, the thesis or dissertation is fundamentally flawed from the outset. Main body text (Justified, 12pt)

The purpose of the study should suggest some theoretical framework to be explained further in this chapter. The literature review thus describes and analyzes previous research on the topic. Background to the study, including a statement of the problem (can be personal) your context and situate yourself in this context, Preliminary Review of the literature (search strategy, narrative summary and critical appraisal) including relevant educational theory. Highlight the gap in the literature that your study addresses. Brief outline of your literature review, your rationale for the study – and outline of relevance to your context finally Specific and achievable research question(s) or in some cases a hypothesis.This chapter, however, should not merely string together what other researchers have found. Rather, the scholar should discuss and analyze the body of knowledge with the ultimate goal of determining what is known and is not known about the topic. This determination leads to your research questions and/or hypotheses. In some cases, of course, you may determine that replicating previous research is needed. It should be a collective review and critique in the candidate's own words of various viewpoints supported by relevant data, and should not be copied from published work. The review should be properly referenced. References should preferably be of the last 15 years, including some published in the recent past. However, older references can be cited provided they are relevant and historical.

A special effort should be made to collect and review all work done in Pakistan on the chosen topic. This should include work published in recognized journals and in publications of various societies and medical colleges. Data collected by others, whether published or unpublished, must be acknowledged whenever included1.

Main body text (Justified, 12pt)

* + 1. **Types of dyspepsia (Left aligned, 12 bold)**

1. **MATERIAL AND METHODS (Centered, 16 Bold)**

(On new page)

**2.1 Study design (Left aligned, 14 bold)**

**2.1 Study design (Left aligned, 14 bold)**

This is an elaboration of your methodology in your synopses which was approved by the AS&RB of KMU. Any additional information which the scholar needs to share with the assessor / evaluator can be added in the methodology section. Past tense should be used here since the research will reflect the project is undertaken in the past.

In this section, the following sequence of headings may be used; Study Design, Study Population/Settings, Sampling Technique, Sample Size, Study Duration: From date to date, Inclusion Criteria, Exclusion Criteria, Data Collection Procedure, Data Analysis Procedure.

Hypothesis: A hypothesis is a statement showing expected relation b/w 2 variables. Hypothesis must be mentioned clearly and must reflect the objectives of the study. An alternate hypothesis should be clearly written in the following study designs:All interventional studies, Cohort, Case control, Comparative cross sectional

Objectives: Objectives are statements of mentions. They inform the reader clearly what the researcher has done in his/her work. The must identify the variables involved in research. Objective should be sufficiently specific, measurable, achievable, relevant and time bound (SMART). The objective should be exactly the same as written in the research proposal & approved by the advanced studies & research board of KMU and should be written in past tense.

Operational Definitions: Should be present in every research thesis/report. Operational definitions reflect the reader or the assessor about how the research measured individual variables, where they were measured, how they were measured. Essentially an operational definition completes once a tool of detection with possible time frame is added to conventional definition.

In case of qualitative or medical education you may provide an overview of study design including theoretical basis for your researcher decisions and the chosen research approach

Description of setting and educational context and how you have identified your participants, Sampling strategy, sample size, selection and recruitment, Data source and data collection procedures, Data management and analysis procedures, Strategies for ensuring quality and rigour, Discuss any important ethical issues and how they will be managed.

**3 RESULTS (Centered, 16 Bold)**

(On new page)

**3.1 Age and sex wise distribution of patients (Left aligned, 14 Bold) 3.1 Age and sex wise distribution of patients (Left aligned, 14 Bold)**

**T**his chapter addresses the results from your data analysis only. This chapter does not include discussing other research literature or the implications of your findings.

Usually you begin by outlining any descriptive or exploratory/confirmatory analyses (e.g., reliability tests, factor analysis) that were conducted. You next address the results of the tests of hypotheses. You then discuss any ex post facto analysis. Tables and/or figures should be used to illustrate and summarize all numeric information.

For qualitative and historical research, this chapter usually is organized by the themes or categories uncovered in your research. If you have conducted focus groups or interviews, it is often appropriate to provide a brief descriptive (e.g., demographic) profile of the participants first. Direct quotation and paraphrasing of data from focus groups, interviews, or historical artifacts then are used to support the generalizations made. In some cases, this analysis also includes information from field notes or other interpretative data (e.g., life history information).

**4 DISCUSSION (Centered, 16 Bold)**

(On new page)

The purpose of this chapter is not just to reiterate what you found but rather to discuss what your findings mean in relation to the theoretical body of knowledge on the topic and your profession. Typically, students skimp on this chapter even though it may be the most important one because it answers the "So what?" question.

Begin by discussing your findings in relation to the theoretical framework introduced in the literature review. In some cases, you may need to introduce new literature (particularly with qualitative research).

This chapter also should address what your findings mean for communication professionals in the field being examined. In other words, what are the study's practical implications?

Doctoral students also should discuss the pedagogical implications of the study. What does the study suggest for mass communication education?

This chapter next outlines the limitations of the study. Areas for future research then are proposed.

**5 CONCLUSIONS (Centered, 16 Bold)**

(On new page)

This is the last section of the text in which conclusions or inferences drawn on the basis of the results of study are described. The conclusions should be linked with the objectives of the study. Recommendations for further research may be included when appropriate It is important to be careful that the conclusions should not go beyond data and should be based on the study results and population**.**

**REFERENCES(Centered, 16 Bold)**

(On new page)

Should be written in Vancouver OR Harvard style as any other style is NOT recommended in KMU. Refer to a variety of guidelines available on the internet to learn about how to write references in Vancouver style. It is generally recommended that reference managers like END NOTE should be used during thesis writing to manage references comfortably.

**Floyd, R.A., 1990. The role of 8-hydroxyguanine in carcinogenesis. Carcinogenesis, 11(9), pp.1447-1450.**

**Henderson, B.E. and Feigelson, H.S., 2000. Hormonal carcinogenesis. Carcinogenesis, 21(3), pp.427-433.**

**Tai, M.H., Chang, C.C., Olson, L.K. and Trosko, J.E., 2005. Oct4 expression in adult human stem cells: evidence in support of the stem cell theory of carcinogenesis. Carcinogenesis, 26(2), pp.495-502.**

**Croce, R., Van Grondelle, R., Van Amerongen, H. and Van Stokkum, I. eds., 2018. Light Harvesting in Photosynthesis. CRC Press.**

**Annexes**

The follow annexes must follow after chapter 8 in the specific order before sending the thesis for binding. However, additional annexes can be added where necessary. The following annexes MUST be included in the thesis in specific order as below;

Annexure I: Copy of approved proposal along with data collection tool from AS&RB KMU.

Annexure II: KMU-AS&RB approval certificate

Annexure III: Ethical clearance certificate from KMU-Ethics board or any other relevant board of any other institute.

Annexure IV: Anti plagiarism certificate issued by Quality Enhancement Cell of KMU.

Annexure V: Any other document relevant to the research project.

Annexure III

Supervision and Co-Supervision forms



*This is an agreement between:*

Name of Supervisee: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_S/O, D/O\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Department/Institute\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

AND

Name of Supervisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department/Institute\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Duration of supervision session: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_TO\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The purpose of supervision is to: meet requirements for training supervision and (any other) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Purpose, Goals and Objectives of Supervision:**

a. To fulfill requirements for training supervision

b. To promote development of supervisee’s professional identity and competence

c. To (Other) (*As agreed upon by supervisor and supervisee)* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

* **Context and Content of Supervision:**

1. The content will focus on the acquisition of knowledge, conceptualization, and skills within the defined scope of practice.

2. The context will ensure understanding of ethics, codes, rules, regulations, standards, guidelines (including consent, confidentiality/ privacy), and all relevant legislation.

3. **A supervisory record form/Students Progress report** will be used to document impressions of each supervisory session. Feedback will be provided at the close of each session.

* **Rights and Responsibilities of Supervisor**

|  |  |
| --- | --- |
| **a. Supervisor Rights**  1. To bring concerns/issues about Supervisee’s work.  2. To question Supervisee about his/her work and workload.  3. To give Supervisee constructive feedback on his/her work performance.  4. To observe Supervisee’s practice and to initiate supportive / corrective action as required. | **b. Supervisor Responsibilities**  1. To uphold ethical guidelines and professional standards.  2. To make sure supervision sessions happen as agreed and to keep a record of the meeting.  3. To create a supervision file containing supervision records and other documents relating to development and training.  4. To ensure that Supervisee is clear about his/her role and responsibilities.  5. To monitor Supervisee’s performance.  6. To set standards and assess the Supervisee against these.  7. To deal with problems as they impact on the Supervisee’s performance.  8. To support supervisee on the agreed personal development plan |

* **Rights and Responsibilities of Supervisee**

|  |  |
| --- | --- |
| **a. Supervisee Rights**  1. To uninterrupted time in a private venue of supervisor’s attention, ideas and guidance.  2. To set part of the agenda and challenge ideas and guidance in a constructive way.  3. To receive feedback and ask questions.  5. To have his/her development/training needs met. | **b. Supervisee Responsibilities**  1. To uphold ethical guidelines and professional standards;  2. To be prepared to discuss patient cases/research findings with the aid of written case notes and / or video / audio tapes;  3. To validate diagnoses, interventions, approaches and techniques used;  4. To be open to change and use alternate methods of practice if required;  5. To consult supervisor or designated contact person in cases of emergency;  6. Implement supervisor directives in subsequent sessions; and  7. Maintain a commitment to on-going research by being regular and on time for each appointment. |

* **Procedural considerations:**

a. Supervisee’s written cases notes (plus research plans) and synopsis/thesis write-up may

be reviewed in each session;

b. Issues relating to supervisee’s professional development will be discussed

c. Sessions will be used to discuss issues of conflict and failure of either party to abide by the guidelines outlined in this contract. If concerns of either party are not resolved in supervision, then head of the institute will be consulted; and

d. In event of an emergency, supervisee to contact supervisor. If not available, then contact head of institute**.**

* **Finances/ Insurance**

What is the source of funding for your research: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*This contract is subject to revision at any time, upon the request of either the supervisee or the supervisor. A formal review, however, will be conducted every six months and revisions to the contract will be made only with consent of the supervisee and approval of supervisor.*

***We agree, to the best of our ability, to uphold the guidelines specified in this supervision contract and to manage the supervisory relationship and supervisory process according to the research & ethical principles of the Khyber Medical University***.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Supervisor Supervisee**

This contract is in effect from **DATE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Date of revision or termination: **DATE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Consent form for Co-Supervision (PhD/ MPhil)**

**Undertaking**

I am willing to guide Mr/Ms/Mrs/Dr ………………………………………………in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(degree) as his/her co-supervisor in his/her research work leading to PhD/MPhil degree at Institute of Pathology and Diagnostic Medicine Medical Sciences, Khyber Medical University. I will guide him/her for the entire duration of his/her research work on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and will supervise him/her work throughout the research process where and whenever required.

Name of the primary Supervisor: ..............................................Signature.......................

Designation: .................................................... Area of speciality: ................................

Contribution:............................................................................................................. ....

................................................. ................................................. ....................................

1. Name of the co-supervisor-I.................................................Signature……...............

Designation: .....................................................Area of speciality: ................................

Contribution:............................................................................................................. ....

................................................. ................................................. ....................................

....................................

2.Name of the co-supervisor-II..................................................Signature.......................

Designation: .......................... ..........................Area of speciality: ................................

Contribution:............................................................................................................. ....

................................................. ................................................. ....................................

................................................. ................................................. ....................................

3.Name of the co-supervisor-III.................................................Signature.......................

Designation: .......................... ..........................Area of speciality: ................................

Contribution:............................................................................................................. ....

................................................. ................................................. ....................................

Date: ..........................................

Annexure IV

Third Party Proof Reader Policy

**Policy on the Use of Third Party Proof-readers**

Students are responsible for their written work: be it an assignment, report, article, thesis, dissertation or any other form of academic writing.

All MPhil/PhD students of IPDM are taught academic writing, Microsoft Office and SPSS during their course work. In addition, a number of workshops are organized regularly throughout the year. Thus as part of academic writing one of the most important skills for a student to develop is proof reading their work. Although this is highly encouraged however, in some instances it may be considered acceptable for students to seek help in proof-reading their work. This help may be by friends or family members or even professional proof-readers. A Proof-reader is any person, other than the author of the text or the supervisor/course leader/tutor (i.e. a third party) who carries out proof-reading.

As a default the guidance to avail any such services as stated below shall apply to all academic assessed work of a word limit of 7000 and above at the final stage and not interim stage of writing.

However if the supervisor or institute decide that the purpose of the assessment is to determine students’ abilities then the rubric for assessment should state clearly that no proof-reading assistance is permitted.

Students wishing to engage the services of a proofreader must do so with the approval of their supervisor and obtain written verification from the member of faculty1.

The use of third party proof-readers is not permitted for work where the word limit is fewer than 7,000 words.

**A proof-reader may**2

* May work on a printed or electronic version of the thesis or dissertation but suggested amendments must be indicated by comment tools, rather than tracked changes3
* Identify typographical, spelling and punctuation errors;
* Identify formatting and layout errors and inconsistencies (e.g. page numbers, font size, line spacing, headers and footers);
* Identify grammatical and syntactical errors and anomalies or ambiguities in phrasing;
* Identify minor formatting errors in referencing (for consistency and order);
* Identify errors in the labeling of diagrams, charts or figures;
* Identify lexical repetition or omissions.

**A proof-reader may not**

* Add to content in any way;
* Check or correct facts, data calculations, formulae or equations;
* Rewrite content where meaning is ambiguous;
* Alter argument or logic where faulty;
* Re-arrange or re-order paragraphs to enhance structure or argument;
* Implement or significantly alter a referencing system;
* Re-label diagrams, charts or figures;
* Reduce content so as to comply with a specified word limit;
* Translate any part of the work.

**Authorial responsibility**

Students have overall authorial responsibility for their work and should choose whether they wish to accept the proof-reader’s advice. A third party proof-reader should mark up the student’s work with suggested changes which the student may then choose to accept or reject.   The thesis/dissertation candidate must keep a copy of the draft that contains the third party’s comments.

Failure to adhere to these guidelines could constitute a breach of academic integrity and [contravene KMU and HEC plagiarism policy](file:///F:\IBMS\Research\Forms%20for%20student%20research\HEC%20Plagiarism%20Policy.pdf). It is therefore the student’s responsibility to provide the proof-reader with a copy of this policy statement.

Thesis proofing/editing services if used should be duly acknowledged in all academic writing including thesis/dissertations. The text to be integrated into the declaration is, as below4:

“I have used a proof-reader, paid or unpaid, to support the submission of this assignment" YES/NO

The University expects all proof-readers to comply with its policy in this area. By ticking 'yes', you confirm that the proof-reader was made aware of and has complied with the IPDM's proof-reading policy”

The use of a third party, does not absolve the supervisor(s) from the normal advisory duties connected with the intellectual content and text of the thesis or dissertation. In this context the intention of this policy is not to stop or restrict good supervisory practice. So as faculty are bound by professional codes of conduct and their primary role is to support students in producing strong academic content they may do this through actively annotating drafts and highlighting/correcting errors that would be prohibited in other contexts4.

Students and supervisors should ensure that both parties are clear regarding to what level proof-reading will be undertaken and with what frequency.

IPDM is unable to comment on or verify the experience or qualifications of any proofreader. The institute will not take responsibility for the quality of work of any particular proofreader.

References

1. Francis L, Placzeck S, Clough G. Policy on Proofreading Students ’ Written Work. 2015.

2. Oxford U of. Policy on the Use of Third Party Proof-readers, Education Committee. [cited 2018 Mar 24]; Available from: https://www.admin.ox.ac.uk/edc/policiesandguidance/policyonproofreaders/

3. Dean of Graduate Studies. Third Party Editing and Proofreading of Theses and Dissertations Guidelines - The University of Auckland [Internet]. 2018 [cited 2018 Mar 24]. Available from: https://www.auckland.ac.nz/en/about/the-university/how-university-works/policy-and-administration/teaching-and-learning/postgraduate-research/undertaking-your-research/third-party-editing.html

4. Hasler L. Proofreading Policy [Internet]. [cited 2018 Mar 24]. Available from: https://warwick.ac.uk/services/aro/dar/quality/categories/examinations/policies/v\_proofreading/

**Circular**

It has been brought to our attention that a number of individuals/groups are offering **‘Thesis Writing Services’** on social and conventional media. These adverts are directed towards post graduate students.

This is to reiterate a zero tolerant policy by IPDM, KMU in accordance to HEC plagiarism policy guidelines, in that:

1. All academic writing by students is their **SOLE** responsibility and is expected to be student’s original work
2. IPDM has a clear cut policy on the use of Thesis proof reading services.
3. Thesis proofing/editing services if used should be duly acknowledged in all academic writing including thesis/dissertations. The text to be integrated into the declaration is, as below:

“I have used a proof-reader, paid or unpaid, to support the submission of this assignment" YES/NO

1. The University expects all proof-readers to comply with its policy in this area. By ticking 'yes', you confirm that the proof-reader was made aware of and has complied with the IPDM's proof-reading policy”
2. It is the sole responsibility of the student to ensure data presented is their original work and thus any plagiarism is the **SOLE** responsibility of the student and cannot be blamed on commercial thesis writing services.
3. Lack of computer literacy cannot be used as an excuse for using these commercial writers.
4. The use of a third party, does not absolve the supervisor(s) from the normal advisory duties connected with the intellectual content and text of the thesis or dissertation

KMU reserves the right to take disciplinary action against students involved in such malpractices according to HEC plagiarism policy guidelines.

It is therefore stated that students remain vigilant and not fall prey to such offers.

Annexure V

IBC Form

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Institutional Biosafety Committee  **BIOSAFETY REGISTRATION FORM**  **(KMU/IBC/Registration\_v1)**  Please follow all instructions. Use additional paper when necessary. Complete and signed forms should be submitted to KMU Biosafety Officer (BSO) | | | | | | | | | | | | | | | | | | | |
| **For official use only:** | | | | | | | | | | | | | | | | | | | |
| IBC application no: | | | | | | |  | | | | | | | | | | | | |
| Ethical approval no: | | | | | | |  | | | | | | | | | | | | |
| Approval date: | | | | | | |  | | | | | | | | | | | | |
| Expiration date: | | | | | | |  | | | | | | | | | | | | |
| Signature and stamp: | | | | | | | | | | | | | | | | | | | |
| **1. Applicant (Principal Investigator/ Student/ Supervisor)** | | | | | | | | | | | | | | | | | | | |
| (1) Name, Degree(s) | | | | | (2) Job Role | | | | (3) If student then degree program ( eg. M. Phil/ PhD) | | | | | | | | | | |
|  | | | | |  | | | |  | | | | | | | | | | |
| (4) Department | | | | | | | (5) Phone: | | | | | | | | | | | | |
| (6) Interoffice Address: | | | | | | | (7) e-mail address | | | | | | | | | | | | |
| b. LIST ***ALL OTHER PERSONNEL*** DIRECTLY INVOLVED IN THIS PROJECT | | | | | | | | | | | | | | | | | | | |
| NAME | | | PROJECT POSITION(S) | | | | EMAIL ADDRESS | | | | | PHONE | | | | | | | |
| (1) | |  | | | |  | | | | |  | | | | | | | |  |
| (2) | |  | | | |  | | | | |  | | | | | | | |  |
| (3) | |  | | | |  | | | | |  | | | | | | | |  |
| (4) | |  | | | |  | | | | |  | | | | | | | |  |
| (5) | |  | | | |  | | | | |  | | | | | | | |  |
| (6) | |  | | | |  | | | | |  | | | | | | | |  |
| **2. RESEARCH PROJECT** | | | | | | | | | | | | | | | | | | | |
| **a. Applying for** (check only one) | | | | | | | | | | | | | | | | | | | |
| New protocol registration 🞏 | | | | | Exemption 🞏 | | | |  | | | | | | | | | | |
| **b. FUNDING SOURCE** (check only one) | | | | | | | | | | | | | | | | | | | |
| Departmental funds 🞏 | | | | | External funds 🞏 | | | | Funding to be applied 🞏 | | | | | | | | | | |
|  | | | | |  | | | |  | | | | | | | | | | |
| **c. PROJECT TITLE** | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| **d. RESEARCH INVOLVES** (check all that apply) | | | | | | | | | | | | | | | | | | | |
| In vitro work 🞏 | | | | | Whole animals 🞏 | | | | Human subjects 🞏 | | | | | | | | | | |
| **e. SPECIFIC AIMS/OBJECTIVES OF THE RESEARCH PROJECT:** | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| **f. SUMMARY OF THE PROJECT: (in lay terms and not exceeding 250 words)** | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| g. **EXPERIMENTAL PROCEDURES** (Briefly describe in lay terms the methodologies employed in the proposed research relevant to biosafety) | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| **h. MICROORGANISMS USED (VIRUSES, BACTERIA, etc.)** | | | | | | | | | | | | | | | | | | | |
| Strain | Characteristic (eg. pathogenic) | | | | Procedure (eg. culture) | | Treatment | | Procedure location | | | | | Hazard to humans (yes/no) | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
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| **i. EXPERIMENTAL ANIMALS** | | | | | | | | | | | | | | | | | | | |
| Animal strain | Characteristic (transgene, immunodeficient) | | | | Procedure (eg. IV, oral) | | Drug/ chemical/ exposure | | Procedure location | | | | | Hazard to human (yes/no) | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
| **j. HUMAN PARTICIPANTS USED (**Briefly describe if participants in your research are healthy, sick, young or old, immunocompetent or immunodeficient) | | | | | | | | | | | | | | | | | | | |
| Participant group (eg. experimental, control) | Characteristic (eg. immunodeficient) | | | | Procedure (eg. IV, oral) | | Drug/ chemical/ exposure | | Procedure location | | | | | Hazard to participant (yes/no) | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
| **k. TYPES OF HUMAN TISSUE USED (**Briefly describe if archived samples are used eg. Paraffin embedded tissues) | | | | | | | | | | | | | | | | | | | |
| Sample type | Characteristic (eg. Potentially hazardous) | | | | Procedure (eg. DNA extraction) | | Further treatment (eg. PCR amplification) | | Procedure location | | | | | Hazard to human (yes/no) | | | | | |
|  |  | | | |  | |  | |  | | | | |  | | | | | |
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|  |  | | | |  | |  | |  | | | | |  | | | | | |
| **l. TYPES OF RADIATION EXPOSURE:** (Briefly describe if research project involves radiation exposure eg. X-ray, radio-isotopes) | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| **m. TYPES OF RECOMBINANT MATERIAL USED (**Briefly describe the origin of recombinant insert or transgene, and vector. Also describe if these can be of potential hazard to the researcher or environment) | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| **4. SAFETY AND PROTECTION** | | | | | | | | | | | | | | | | | | | |
| **a. Standard operating procedures (SOP) written and approved by the PI/Supervisor?** | | | | | Yes 🞏 | | | | No 🞏 | | | | | | | | | | |
| **b. Which buildings/laboratories will be used in your research?** (Research projects with a particular biosafety requirement must be conducted in building/laboratory with required biosafety level) | | | | | | | | | | | | | | | | | | | |
| **Laboratory** | | | | | | | **Biosafety level available** | | | | | | | | | | | | |
|  | | | | | | |  | | | | | | | | | | | | |
|  | | | | | | |  | | | | | | | | | | | | |
|  | | | | | | |  | | | | | | | | | | | | |
| **5. SHIPPING AND TRANSPORT:** (Briefly describe if the biohazardous material will be transported to a local, national or international laboratory. Describe what measures will be undertaken to ensure safe transport) | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | |
| **6. TRAINING:** (Briefly describe if the researchers working on this project have received appropriate biosafety training. If no, a training with biosafety office must be arranged before start of the project) | | | | | | | | | | | | | | | | | | | |
| **Name of researcher** | | | | **Biosafety level required** | | | | **Training received:** | | | | | | |  | | | | |
|  | | | |  | | | | Yes 🞏 | | | | | | | No 🞏 | | | | |
|  | | | |  | | | | Yes 🞏 | | | | | | | No 🞏 | | | | |
|  | | | |  | | | | Yes 🞏 | | | | | | | No 🞏 | | | | |
|  | | | |  | | | | Yes 🞏 | | | | | | | No 🞏 | | | | |
| **6. OCCUPATIONAL HEALTH REQUIREMENTS:** | | | | | | | | | | | | | | | | | | | |
| i. Have you ensured safe disposal of solid sharp waste generated in this project? | | | | | | | | | | Yes 🞏 | | | No 🞏 | | | | NA 🞏 | | |
| ii. Have you ensured safe disposal of non-sharp solid waste generated in this project? | | | | | | | | | | Yes 🞏 | | | No 🞏 | | | | NA 🞏 | | |
| iii. Have you ensured safe disposal of liquid waste generated in this project? | | | | | | | | | | Yes 🞏 | | | No 🞏 | | | | NA 🞏 | | |
|  | | | | | | | | | | | | | | | | | | | |
| **7. WASTE DISPOSAL:** | | | | | | | | | | | | | | | | | | | |
| i. Are there any special groups of workers at risk of infection or disease from the use of the biohazard(s)/ hazardous drug(s) (e.g. pregnant, immuno-compromised, allergic, etc.)? If yes, describe below: | | | | | | | | | | Yes 🞏 | | | | No 🞏 | | | | NA 🞏 | |
| ii. Are any special immunizations necessary for personnel involved in the research (e.g. Hepatitis B, Tetanus/Tdap, etc.)? If yes, describe below: | | | | | | | | | | Yes 🞏 | | | | No 🞏 | | | | NA 🞏 | |
| Is there a need to monitor the health of personnel involved (e.g. testing)? If yes, describe below: | | | | | | | | | | Yes 🞏 | | | | No 🞏 | | | | NA 🞏 | |
|  | | | | | | | | | | | | | | | | | | | |
| **6. ASSURANCE:** | | | | | | | | | | | | | | | | | | | |
| **a. PRINCIPAL INVESTIGATOR/ STUDENT/SUPERVISOR** | | | | | | | | | | | | | | | | INTIALS | | | |
| I certify the information provided in the KMU IBC registration form is complete and accurate and understand my responsibilities as noted in it. | | | | | | | | | | | | | | | |  | | | |
| No changes will be made without advance approval form the KMU Institutional Biosafety committee. | | | | | | | | | | | | | | | |  | | | |
| I acknowledge my responsibility for the safe conduct of this research in accordance with KMU IBC guidelines | | | | | | | | | | | | | | | |  | | | |
| Involving Recombinant DNA Molecules. I will inform all associated personnel of the nature and risks of this work, as well as necessary precautions and safe practices. | | | | | | | | | | | | | | | |  | | | |
| I also agree to comply with the requirements for the shipment and transfer of recombinant DNA materials. | | | | | | | | | | | | | | | |  | | | |
| I further acknowledge my responsibility to ensure compliance with the following: | | | | | | | | | | | | | | | | | | | |
| (1) Work surfaces will be appropriately decontaminated at least daily and immediately after working with biohazardous materials. | | | | | | | | | | | | | | | |  | | | |
| (2) All personnel involved will wash thoroughly with soap and water. Clothing will be changed as needed. | | | | | | | | | | | | | | | |  | | | |
| (3) All contaminated materials will be discarded appropriately according to KMU IBC guidelines (e.g. as Biohazard waste, as Hazardous drug waste, as Chemotherapeutic waste). | | | | | | | | | | | | | | | |  | | | |
| (4) BSO (KMU IBC) will be immediately notified of all spill or incidents occurred at biosafety level 2 and up laboratories. | | | | | | | | | | | | | | | |  | | | |
| (5) In the event of an incident where there is a risk of infection or other consequences to incident, affected personnel will be counselled to seek appropriated medical attention. | | | | | | | | | | | | | | | |  | | | |
| **SIGNATURE:** | | | | | | | **Date:** | | | | | | | | | | | | |
| **b. CO- INVESTIGATOR** | | | | | | | | | | | | | | | | | | | |
| I certify that I have reviewed this Biosafety Registration form and that the information provided in it is complete and accurate. | | | | | | | | | | | | | | | | | | | |
| SIGNATURE OF CO- INVESTIGATOR | | | | | | | **Date:** | | | | | | | | | | | | |
| SIGNATURE OF CO- INVESTIGATOR | | | | | | | **Date:** | | | | | | | | | | | | |
| SIGNATURE OF CO- INVESTIGATOR | | | | | | | **Date:** | | | | | | | | | | | | |
| SIGNATURE OF CO- INVESTIGATOR | | | | | | | **Date:** | | | | | | | | | | | | |
| **c. ENDORSEMENT OF HEAD OF INSTITUTION** (not needed for KMU students/supervisors/PIs who have received ASRB approval) | | | | | | | | | | | | | | | | | | | |
| In addition to endorsing the PI’s certification, if the experiments are supported primarily by department or university funds, I certify that I have reviewed the protocol and it is judged to be of scientific merit. | | | | | | | | | | | | | | | | | | | |
| SIGNATURE AND STAMP OF THE HEAD OF INSTITUTION | | | | | | | **Date:** | | | | | | | | | | | | |

Annexure VI

Grant application

Application form FOR RESEARCH GRANT (PHd/Masters/Undergraduate students)

Serial No (for office use):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date of submission:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of the institute:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date of Registration with institute: \_\_\_\_\_\_\_\_\_\_\_\_session: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Program/Specialty:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Fathers name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ContactNo:\_\_\_\_\_\_\_\_\_\_\_\_\_\_Email\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name & Designation of Supervisor:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Type of Participants: Humans\_\_\_\_\_Animals\_\_\_\_\_ Others specify):\_\_\_\_\_\_\_\_\_\_\_\_\_

Title of the project:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expected Number of Research Articles to be published after completion of Project:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Please tick the following checklist before submission:**

**Budget Attached:** Yes / No

**Availed any Grant already for this Research Project:** Yes / No

**Applied for grant to any other Funding Agency:** Yes / No

**KMU-AS&RB Approval obtained (NA for undergraduates):** Yes / No

**Candidate Signature:**

**Supervisor Signature and Stamp:**

***For office (KMU ORIC-MC) use only***

Date Received:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date of discussion in KMU-ORIC-MC:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Remarks:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Amount Requested in Budget:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Amount Approved by ORIC MC:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Director ORIC KMU: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Chairman KMU ORIC-MC:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Annexure VII

Research Integrity

**Appendix A; Policy 2016-01-ORIC**

**Undertaking of Integrity**

**I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ s/o | d/o \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, resident of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ National Id Card No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**hereby solemnly undertake that I have been thoroughly briefed about and have understood all the rules and bylaws of Khyber Medical University regarding Academic, Intellectual, and Research Integrity and will abide by them without any exceptions.**

**I fully acknowledge the fact that in case I am found guilty of breach of any of these valued principles, I will be subject to disciplinary action including, but not limited to, termination of my services / studies and blacklisting for any future employment / admission in any constituent or affiliated institution of Khyber Medical University.**

**Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Appendix B; Policy 2016-01-ORIC**

**Research Scholar’s Undertaking**

**I \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_s/o | d/o \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ resident of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ National Id Card No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a scholar at: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, for the degree of: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ am submitting to the Advanced Studies and Research Board the research proposal titled: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**I hereby solemnly undertake that I will carry out my research in strict compliance with the policies of Khyber Medical University Khyber Medical University, in full commitment to the principles of Intellectual and Research Integrity and Ethics.**

**I solemnly affirm that I will absolutely avoid plagiarism, fabrication, and falsification and that I will not only avoid any use of mercenary authorship and ghostwriting, but will also report such practices to the institution immediately on any knowledge of these.**

**I acknowledge that the penalty for any breach of these practices is immediate termination of studies, expulsion from the institution, and blacklisting for any future admission in any constituent of affiliated institution of Khyber Medical University.**

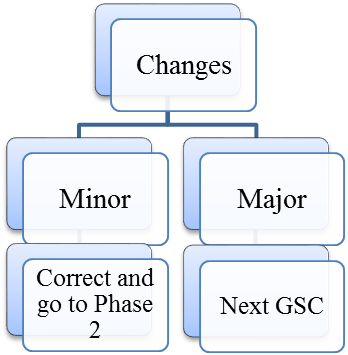
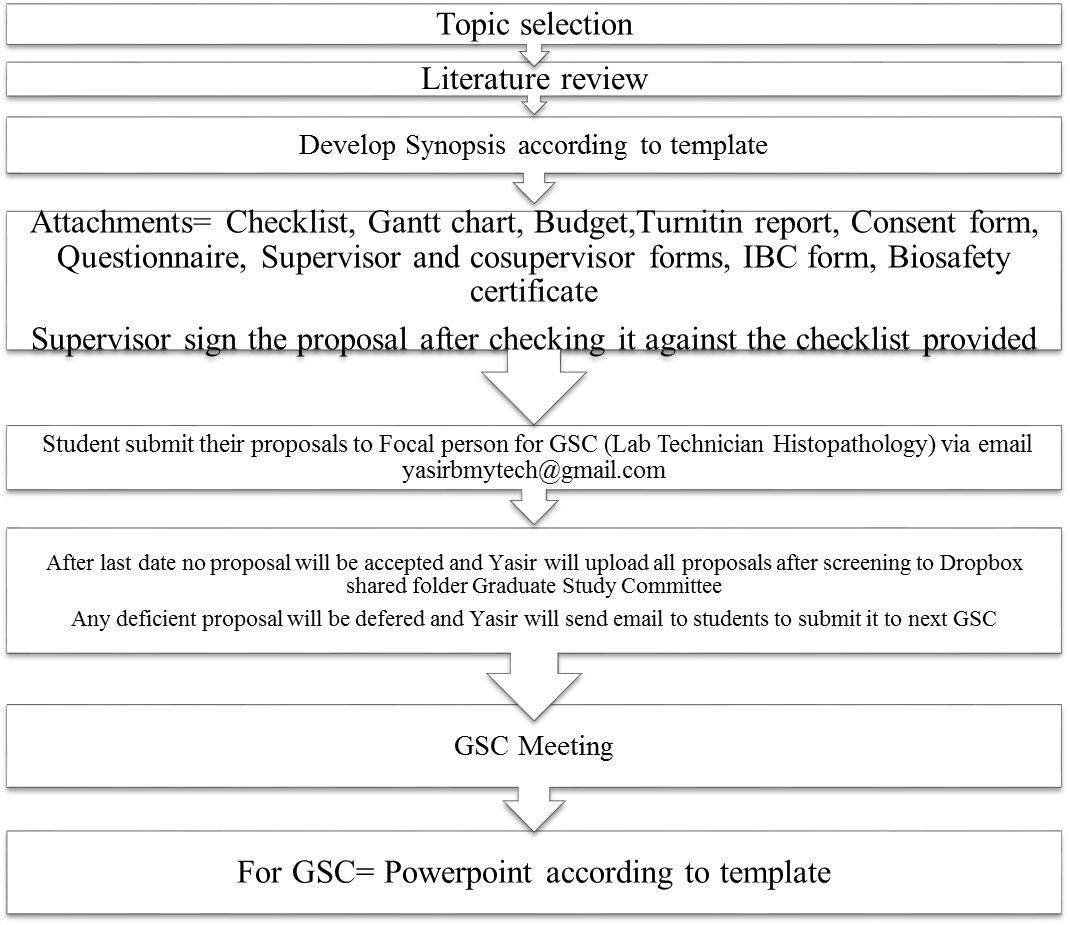
**I also acknowledge that even after I have been awarded my degree, if any such allegation is proved beyond reasonable doubt, my degree will be cancelled and I will be blacklisted for any future employment or studies in any of the constituent or affiliated institutions of Khyber Medical University**

**Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

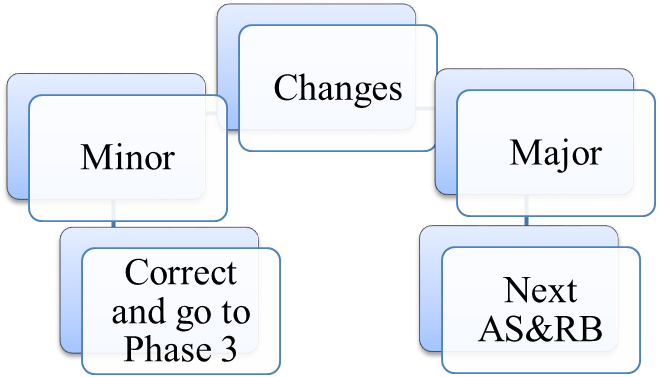
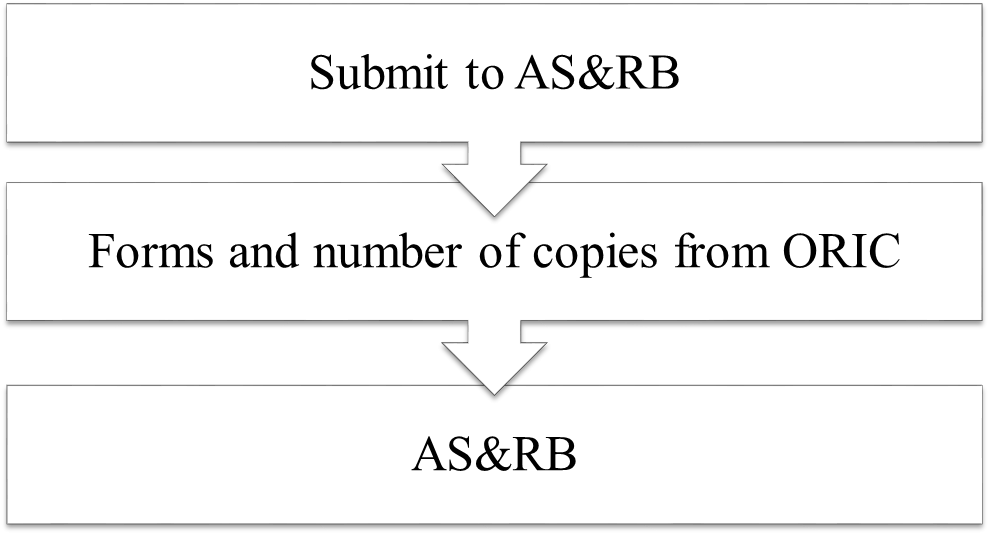
Annexure VIII

Phase wise flow of MPhil

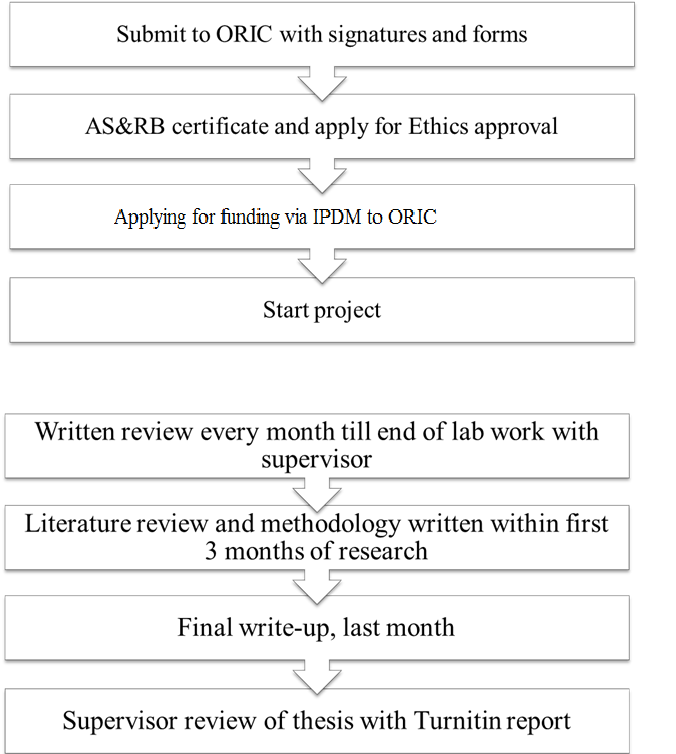
**PHASE 1: End of Semester 2/beginning of Semester 3**



**PHASE 2: End of Semester 2/beginning of Semester 3**

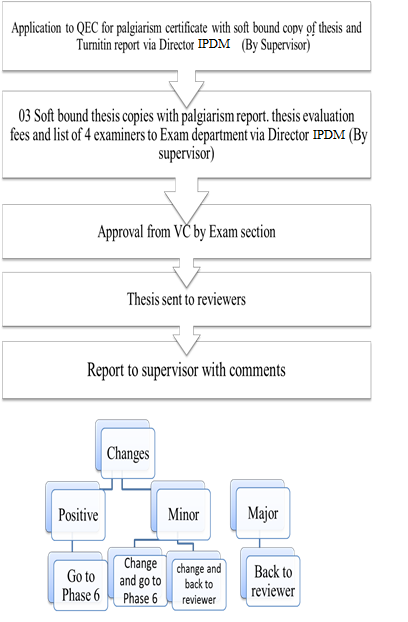


**PHASE 3: Semester 3**

****

**Phase 4: Semester 3 and 4**

**Phase 5: Semester 4 end**



**Phase 6: Semester 4 end**