

# **Baba Farid University of Health Sciences**



## **Ordinances & Syllabus**

**M.Sc. Histopathology**  
(2 Years Degree Programme)

Faridkot -151203

## Ordinances

### M.Sc. Histopathology

#### 1. Duration of Course:

Duration of Master of Science in Histopathology shall be two years.

#### 2. Eligibility for admission

- a) This course shall be open to a candidate who have passed regular B.Sc.(MLT) degree with 50% or above marks from any recognized College/Institution affiliated to Baba Farid University of Health Sciences, Faridkot

OR

- b) Any other examination recognized by the Board of Management of this University as an equivalent course / examination thereto, from time to time.

#### 3. Medium of Instructions

The medium of instruction during the course and examinations shall be English.

#### 4. Examination Schedule:

- 4.1 The examination shall be held twice a year in the months of May/June and November/December or on such other dates as may be decided by the Board of Management on the recommendation of Faculty of Medical Sciences and Academic Council.
- 4.2 Normally, the University shall conduct not more than two examinations in a year, for any subject, with an interval of not less than four and not more than six months between the two examinations.
- 4.3 The last date by which examination forms and fee must reach the Controller of Examinations/Registrar shall be as follows :-

Examinations	without late fee	with late fee of Rs.200/-	with late fee of Rs.500/-	with late fee of Rs.1500/-
May/June	March 1	March 15	March 31	April 15
Nov./Dec.	Sept. 15	Sept. 30	Oct. 15	Oct. 31

**Note:** Vice-Chancellor may permit acceptance of examination form and fee ten days before the commencement of examination with a late fee of Rs.2000/-. The fee structure is revisable by the University from time to time.

### 5. First year M.Sc. Histopathology

- a) The First Year M.Sc. Histopathology shall be open to a person who has been enrolled for one academic year preceding the examination in a Colleges/Institutions affiliated to this University.
- b) The First Year M.Sc. Histopathology shall be conducted by the Head of the Department in the following subjects:-

Subject Code/ Paper	Paper	Max. Marks		Total
		Theory	Practical	
MSCHP-01/ Paper-I	Basic Histological Techniques	50	100	200
MSCHP-02/ Paper-II	Special Histological Techniques	50		

**Note:** The awards will be retained by the Heads of the Department for the purpose of calculating Internal Assessment in the Second Year.

### 6. Thesis

- i) Every candidate shall submit a thesis plan to the University within six months from the date of admission.
- ii) Every candidate shall carry out work on an approved research project under the guidance of a recognized PG Teacher, the results of which shall be written up and submitted in the form of a thesis by the candidate.
- iii) Thesis shall be submitted to the University six months before the commencement of the Second Year Theory Examinations i.e. by 30<sup>th</sup> November of the preceding year for May/June examinations.
- iv) The Vice-Chancellor may allow a candidate to submit the thesis within one month after the date fixed for the purpose with the prescribed late fee.
- v) The thesis shall embody the results of the candidate's own research and/or experience and shall contain precise reference to the publications quoted, and must attain a good standard and shall be satisfactory in literary presentation and in other respects and should end with a summary embodying conclusions arrived at by the candidate. The thesis shall be typewritten on one side of the paper (size 11" x 8 ½") with margins of 1½" on each side, bound, indicating on the outside cover its title and the name of the candidate.
- vi) The thesis shall be examined by a minimum of two examiners, one internal and one external examiner. Ordinarily, this examiner will not be appointed the External Examiner for theory and Clinical/Practical examination. The candidates who have submitted the thesis in University will be allowed to appear in the final examination. However, the result shall be declared only on receipt of the thesis acceptance from both the examiners.
- vii) The internal examiner shall send only report to the University after evaluation of thesis and the evaluated copy will be deposited in the college library for reference of the students. The external examiner shall also send copy of the thesis along with the report to the University. The University shall keep two copies in the University Library for reference of the students.

## 7. Second Year M.Sc. Histopathology

The Second Year M.Sc. Histopathology shall be open to a person

- a) who has been enrolled for two academic year preceding the examination in a Colleges/Institutions affiliated to this University.
- b) has submitted his/her name to the Controller of Examination/Registrar by the Principal of the College/Institutions with the following certificates:-
  - i) of having attended separately in theory and practical/clinical not less than 75% percent of the lectures delivered and practicals conducted in each of the subjects prescribed for the examination provided that deficiency in the number of lectures delivered and practicals conducted may be condoned by the Principal to the extent of 10% of the lectures delivered.
  - ii) of having secured at least 35% marks of the total marks fixed for internal assessment in each subject, separately, in order to be eligible to appear in all University examinations.
  - iii) Must have submitted the thesis
  - iv) of good moral character.

- Note:**
- 1) Internal Assessment shall be submitted to the University at least two weeks before the commencement of theory examinations or within one week from the issuance of Roll Numbers by the University. All the colleges shall adopt uniform criteria for Internal Assessment as follows:-
    - a) Attendance above 90% to be acknowledged with 10% extra weight-age for Internal Assessment.
    - b) At least two tests to be held in each year in addition to the pre-final (send up) examination. The Internal Assessment should be the average of all awards of these tests taken together.
    - c) **Criteria for calculation of Internal Assessment**
      - i) House Examinations - 80%
      - ii) Attendance (above 90%) - 10%
      - iii) Subject assessment (candidate's conduct and extra curricular participation) - 10%
    - d) Additional mandatory requirement for Internal Assessment to be observed by all colleges.
      - i) All test marks obtained by candidates will be displayed on Notice Boards of respective departments as and when they are awarded.
      - ii) All computations of Internal Assessment of the entire class made by the HOD of the department shall be displayed on the notice board of the department showing individual test marks, advantage of all tests, attendance advantage and subjective assessment and the total Internal Assessment thus derived for at least one week before sending the awards to the Principal's office.
      - iii) Professor Incharge/HOD preparing Internal Assessment shall certify that the detailed assessment of the entire class has been displayed on the department Notice Board for at least one week prior to its being submitted for onward transmission to the University and that adequate opportunity has been given to all the students to file any objections and that the same have been addressed satisfactory.

- iv) The Principal forwarding the Internal Assessment to the University shall countersign the above referred certificate of the HOD/Professor Incharge preparing the Internal Assessment.
- e) The re-appear/fail students will be re-assessed every time for the purpose of Internal Assessment.
- 2) If a candidate fulfils the condition laid down in clause 7 above, he/she may be allowed to take the examination.
- 3) Every candidate before appearing in Second Year Examination must have cleared House Examination securing at least 50 percent marks in both theory as well as practical separately.
- c) The Second Year M.Sc. Histopathology Annual Examination shall be held in May/June and the supplementary within six months of the Annual Examination.
- d) The Second Year M.Sc. Histopathology examination shall be held in the following subjects and candidate shall be required to pass all the subjects:-

Subject Code / Paper	Subject	Theory				Practical			Grand Total
		Marks	Int. Assessment	Viva	Total	Marks	Int. Assessment	Total	
MSCHP-01/ Paper-I	Basic Histological Techniques	80	80	120	520	200	80	280	800
MSCHP-02/ Paper-II	Special Histological Techniques	80							
MSCHP-03/ Paper-III	Basic and Advanced Histological Techniques	80							
MSCHP-04/ Paper-IV	Special Histological Techniques including immune- histochemistry and Molecular Pathology	80							

- i) Each theory paper shall be of three hours duration.
- ii) The minimum number of marks to pass the examination shall be 50% in theory & practical separately.
- iii) The candidate who will absent himself/herself from the examination will be deemed to have been failed in the examination.
- iv) The candidate who has completed his/her training of two years and has failed in the examination may appear again in a subsequent examination without further training and without submitting a new thesis.

- v) The candidate must pass the examination in a maximum of three (1+2) attempts +1 (mercy chance on the discretion of Vice-Chancellor) failing which, he/ she will not be allowed to continue his studies.

**8. Number of Examinations**

The examination shall be conducted twice a year in May/June and November/December or on such dates as determined by the University from time to time.

**9. Grace Marks:**

There shall be no provision for grace marks.

**10. Board of Examiners**

- i) There shall be four examiners – two internal and two external.
- ii) Professor & Head of the Department shall be the Convener and first examiner. The second Internal Examiner will be appointed by annual rotation from amongst the Professors/Associate Professors/Assistant Professor who fulfills the criteria of PG teacher. In case of non-availability of Professors/Associate Professors/Assistant Professor in the department the teacher who fulfils the minimum requirements to be an examiner may be appointed as Internal Examiner.
- iii) The examiners shall be appointed by the University from the teachers working in the Medical Colleges affiliated to it, preferably from the colleges where this course is being run, on the recommendations of the Board of Studies in Medical Sciences and Faculty of Medical Sciences.

**11. Paper setting and moderation of Question Papers:**

The University may get each paper set from External Examiner only. The moderation of question papers may be got done under the directions of the Vice-Chancellor, if necessary.

**12. Evaluation of Answer Books:**

The answer books shall be got evaluated by putting fictitious roll numbers thereon or spot evaluation (table marking) or any other method under the directions of the Vice-Chancellor.

**11. Declaration of Result and minimum pass marks:**

A candidate shall be declared successful only when his thesis has been accepted and the candidate has obtained a minimum of 50% in theory and practical separately.

A successful candidate on the basis of theory and practical marks taken together shall be classified as under: -

**Second Class** : A candidate obtaining 50% or more marks but less than 60% marks  
**First Class** : A candidate obtaining 60% or more marks  
**First Class with Distinction** : A candidate obtaining 80% or more marks

**12. Award of Degree**

Each successful candidate shall be awarded a degree of M.Sc. Histopathology.

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**SYLLABUS****M.Sc. Histopathology****Instructions to Paper Setter**

- Note: 1) The question paper covering the entire course shall be divided into two sections. Each section to be attempted in a separate answer book and to be evaluated by separate examiners.
- 2) In each section there shall be 8 questions of 5 marks each and total weight-age being 40 marks

**Section A** (Max. marks 40)

**Section B** (Max. marks 40)

**SYLLABUS**  
**M.Sc. Histopathology**  
**MSCHP-01 PAPER – I**  
**BASIC HISTOLOGICAL TECHNIQUES**

1. **Laboratory management**
  - a) Collection, handling and storage of specimen
  - b) Utilisation and maintenance of general laboratory equipment including minor repairs
  - c) Sterilisation of apparatus and reagents
  - d) Safety precautions including those of radioactive material
2. **Laboratory application of Microscopy:**
  - a) Principle, application and maintenance of light microscope with knowledge of various types of lenses (simple and compensated)
  - b) Principle of dark-ground illumination
  - c) Principle of phase contrast microscope
  - d) Principle of polarizing microscope
  - e) Principle of fluorescent microscope
  - f) Principle of electron –microscope
3. **Histology of normal tissue**  
 Recognition of normal human tissue in sections.
4. **Fixation**
  - a) Methods of fixation for biopsies and gross specimens i.e. immersion, injection etc.
  - b) Secondary fixation and post-mordanting.
  - c) Post-chromation.
  - d) Effects of fixation on subsequent staining.
5. **Processing of tissues**
  - a) Manual processing
  - b) Automatic processing
  - c) Different embedding media and their particular use i.e. paraffin wax, celloidin, gelatin, water soluble waxes, ralwax etc,
  - d) Dehydrating and clearing agents.
  - e) Rapid celloidin processing.
  - f) Different methods of decalcification and their effect on staining.
  - g) Double embedding.
  - h) Vacuum impregnation.
6. **Microtomy**
  - a) Working principle and use of various types of microtomes.
  - b) Use and maintenance of various types of microtomy knives including automatic knife sharpener and different types of adhesives
  - c) Preparation of thin section, step section and serial section.
  - d) Practical difficulties in section cutting and their remedy.

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**SYLLAUBS**  
**M.Sc. Histopathology**  
**MSCHP-02 PAPER – II**

**SPECIAL HISTOLOGICAL TECHNIQUES**

- 1. Staining**
  - a) Theory and practice of staining
  - b) Principal and application of different staining methods i.e. direct staining, indirect staining, progressive and regressive staining, metallic impregnation, metachromasia etc.
- 2. Recognition of artifacts in sections**
  - a) Cutting artifacts.
  - b) Processing artifacts.
  - c) Staining artifacts.
- 3. Museum techniques**
  - a) Fixation and staining for individual tissue
  - b) Preparation of specimens including specimen castings
  - c) Colour and transparency maintenance
  - d) Mounting of specimen
  - e) Labeling
  - f) Specimen storage
- 4. Photography**
  - a) Practical approach for gross and microphotography –
    5. Exposure
    6. Developing and fixing
    7. Printing
    8. Glazing
  - b) Digital gross and photo micrograph and the use of computers.
- 5. Storage of tissue blocks and sections.**
- 6. Autopsies and mortuary maintenance**

**SYLLAUBS**  
**M.Sc. Histopathology**  
**MSCHP-03 PAPER – III**

**BASIC AND ADVANCED HISTOLOGICAL TECHNIQUES**

**1. Application of various microscopes in the field of morbid anatomy and Histopathology.**

- a) Fluorescence microscopy
  - 1. Principle and different components
  - 2. Fluorescent antigen antibody reaction
  - 3. Primary fluorescence
  - 4. Secondary fluorescence and use of various fluorochromes.
- b) Polarised microscopy
  - i) Isotropic and anisotropic substances
  - ii) Identification of lipids, pigments, crystals and amyloid
- c) Dark ground illumination
  - i) Principle
  - ii) Identification of T. Pallidum and minerals after micro-incineration.
- d) Phase contrast microscopy
  - i) Study of unstained cells and tissue structures.
- e) Electron microscopy
  - i) Working principle and application.

**2. Use of sliding and sledge-microtomes to prepare large sections of:**

- a) Brain
- b) Lung
- c) Whole kidney etc

**3. Special techniques for**

- a) Bone marrow processing
- b) Un-decalcified bone sections
- c) Processing and embedding of eyeball

#### 4. **Electron Microscopy Techniques-**

Preparation of material for electron microscopy

- a) Fixation, post ossification, dehydration, clearing, upon and araldite embedding, preparation and curing of Epon / araldite blocks, trimming of blocks.
  - b) Ultra-microtomy
    - i) Working principle and use of ultra-microtome.
    - ii) Cutting 1 $\mu$  and ultra-thin sections.
    - iii) Staining of 1 $\mu$  and ultra thin sections with Toluidine blue and metal salts respectively.
  - c) Utilization and maintenance of an Electron Microscope
    - i) Alignment of electron beam.
    - ii) Screening of grids.
    - iii) Taking photographs.
  - d) Photographic techniques for electron micrograph
    - i) Developing of films.
    - ii) Printing and make enlargement.
5. **Study of pathological tissues and identification of various lesions and tumours in sections.**
6. **Autoradiography**
- a) Principle
  - b) Various isotopes used and their precautions.
  - b) Techniques – emphasizing upon Dipping and Stripping techniques
  - c) Exposure
  - d) Staining of autoradiographs.
7. **Micro-Incineration**
- a) Principle
  - b) Technique
  - c) Method of section examination
8. **Microphotograpy:**
- a) Exposure
  - b) Developing & fixing
  - c) Printing
  - d) Glazing
9. **Microwave technology and its application to histology**

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**SYLLAUBS**  
**M.Sc. Histopathology**  
**MSCHP-04 PAPER – IV**

**SPECIAL HISTOLOGICAL TECHNIQUES INCLUDING  
IMMUNOHISTOCHEMISTRY AND MOLECULAR PATHOLOGY**

1. **Special techniques for histochemical studies**
  - a) Freeze drying
  - b) Vapor fixation
  
2. **Principles of Histochemical and advanced special staining techniques**

<ol style="list-style-type: none"> <li>a) Carbohydrates</li> <li>c) Proteins</li> <li>e) Pigments</li> <li>g) Cytoplasmic organelles</li> <li>i) Pituitary cells</li> <li>k) Hemoglobin</li> <li>m) Melanin</li> <li>o) Argentaffin cell granules</li> <li>q) Bacteria</li> <li>s) Spirochetes</li> <li>u) Mucin</li> <li>w) Nissl granules</li> <li>y) Microglia</li> <li>aa) Axons</li> <li>cc) Purkinje cells</li> </ol>	<ol style="list-style-type: none"> <li>b) Amyloid</li> <li>d) Lipids</li> <li>f) Minerals</li> <li>h) Pancreatic islets</li> <li>j) Fibrin</li> <li>l) Bile pigment</li> <li>n) Adrenal medulla</li> <li>p) Peneth cells</li> <li>r) Fungus</li> <li>t) Inclusion bodies</li> <li>v) Astrocytes</li> <li>x) Glial fibres</li> <li>z) Oligodendrocytes</li> <li>bb) Neurofibrills</li> <li>dd) Nerve endings.</li> </ol>
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3. **Enzyme Histochemistry**
  - a) Preparation of post-fixed and prefixed cryostat sections
  - b) Demonstration of the following enzymes
    - i) Phosphatases – Acid ph-ase, alkaline ph-ase and ATP-ases.
    - ii) Dehydrogenases
    - iii) Oxidases.
    - iv) Esterases.
    - v) Tyrosinase.
  
4. **Immunohistochemistry**
  - a) Principle –direct, indirect and other special techniques
  - b) FIC and FITC techniques
  - c) Techniques of unmasking of antigen sites
  - d) Enhancement and amplification of binding sites
  - e) Double or multiple labeling technique
  - f) Preparation of conjugates
  - g) Blocking of endogenous enzyme and background
  - h) Methods for frozen and paraffin sections.
  - i) Controls, internal & external quality assessment.

**5. Molecular Pathology**

- A. In-situ-hybridisation
  - i) Principle
  - ii) Technique and application
  - iii) Probes
  - iv) Application in fixed tissue sample
- B. Polymerase chain reaction- principle, types and utilisation
- C. Electrophoresis – principle, types and application

**6. Image Analysis -**

Overview, technique, specimen preparation and analysis, and software.

**7. Flow Cytometry:-**

Principle, technique, specimen collection and preparation, application.

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**Subject: Copy of paras of the Minutes of the 45<sup>th</sup> meeting of the Board of Management held on 14.10.2016 at 02:30 pm in the Committee Room, State Institute of Health & Family Welfare Complex, SAS Nagar (Mohali)**

14. Considered the recommendations of the Academic Council made in its 25<sup>th</sup> meeting held  
19. on 30.08.2016 vide para-15 and after some discussion it was **RESOLVED:** To approve that Guide: Student Ratio for PG Paramedical Courses i.e. M.Sc./ Master in Hospital & Healthcare Administration (MHHA), etc. will be 1:3 under the Faculty of Medical Sciences. It was informed by Vice-Chancellor that the recommendations are within the prerogative of the University and no approval is required from the Central Council/body(s).