# Baba Farid University of Health Sciences

## Ordinances & Syllabus

### M.Sc. Medical Laboratory Technology (Biochemistry)

(2 Years Degree Programme)

Faridkot -151203

5. **First year M.Sc. Medical Laboratory Technology (Biochemistry)**

a) The First Year M.Sc. Medical Laboratory Technology (Biochemistry) 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. Medical Laboratory Technology (Biochemistry) shall be conducted by the Head of the Department in the following subjects:-

| Subject Code/Paper | Paper | Max. Marks | | Total |
|---|---|---|---|---|
| | | Theory | Practical | |
| MSCMLTMB-01/ Paper - I | General Biochemistry and Metabolism of Biomolecules | 50 | 100 | 200 |
| MSCMLTMB-02/ Paper - II | Enzymology, Hormones and Nutrition | 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 30th 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.

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. Medical Laboratory Technology (Biochemistry) Annual Examination shall be held in May/June and the supplementary within six months of the Annual Examination.

d) The Second Year M.Sc. Medical Laboratory Technology (Biochemistry) 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 | |
| MSCMLTMB-01/ Paper - I | General Biochemistry and Metabolism of Biomolecules | 80 | 80 | 120 | **520** | 200 | 80 | **280** | **800** |
| MSCMLTMB-02/ Paper - II | Enzymology, Hormones and Nutrition | 80 | | | | | | | |
| MSCMLTMB-03/ Paper – III | General Physiology, Acid Base Balance and Organ Function Tests | 80 | | | | | | | |
| MSCMLTMB-04/ Paper – IV | Genetics, Immunology and analytical Biochemistry | 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.

## SYLLABUS

### M.Sc. Medical Laboratory Technology (Biochemistry).

### Scope and Objective

Post Graduate programme in Medical Laboratory Technology (Biochemistry) gives opportunity for specialized study in the field of Laboratory Technology for BSc (MLT)graduates. Candidates who successfully complete MSc MLT (Biochemistry) course may obtain jobs as

- Specialized technologist in Biochemistry or supervisors of clinicallaboratories in hospitals.
- Laboratory scientists in Biomedical and research institutes.
- Tutor in training institutes of Medical Laboratory Technology.
- Utilize or apply the concepts, theories and principles of laboratory science.
- Demonstrate the ability to plan an effect the change in laboratory practice and health care delivery system.
- Establish collaborative relationship with members of other disciplines.
- Demonstrate interest in continued learning and research for personal and professional advancement.

**Distribution of teaching hours for MSc Medical Laboratory Technology (Biochemistry) – 1st year**

| Paper | Subject | Theory hour | Practical hour | Clinical Laboratory Practice hour | Total hour |
|---|---|---|---|---|---|
| Paper-I | General Biochemistry and Metabolism of Biomolecules | 100hour | 100 hour | 1200 hour | 1600 hour |
| Paper-II | Enzymology. Hormones and Nutrition | 100 hour | 100 hour | | |
| **Total** | **First year** | **200 hour** | **200 hour** | **1200 hour** | **1600 hour** |

**Distribution of teaching hours for MSc Medical Laboratory Technology (Biochemistry) – 2nd year**

| Paper | Subject | Theory hour | Practical hour | Clinical Laboratory Practice hour | Total hour |
|---|---|---|---|---|---|
| Paper-III | General Physiology, Acid Base Balance and Organ Function Tests | 100hour | 100 hour | 1200 hour | 1600 hour |
| Paper-IV | Genetics and Analytical Biochemistry | 100 hour | 100 hour | | |
| **Total** | **Second year** | **200 hour** | **200 hour** | **1200 hour** | **1600 hour** |

## Detailed Syllabus

### MSCMLTMB-01/ Paper - I

### M.Sc. MLT (Biochemistry)

### Theory Paper- I (100 hours)

### General Biochemistry and metabolism of Biomolecules

**Chemistry of living things:** Structure of cell, animal, bacteria and virus. Nucleus, Organelles, cell-membrane.Structure and functions.
**Biomolecules** : Characteristics and properties.
**Proteins:** Classification, Digestion & Absorption, properties and chemistry of amino acids and proteins, peptides, structure of proteins and classification.
**Aminoacid metabolism:** Transamination, deamination, oxidative deamination, ammonia transport, urea formation, Metabolism of individual amino acids, Biosynthesis of catecholamine, melanin formation, Nitrogen balance, Inborn errors of metabolism.
**Carbohydrates**: Classification, Digestion & Absorption, Chemistry and properties Glycoproteins,
**Carbohydrate Metabolism:** Glycolysis, Gluconeogenesis, Uronic acid pathway, TCA cycle, HMP pathway, Glycogen metabolism, Galactose metabolism, Fructose metabolism, Regulation of blood glucose, Inborn errors of metabolism.
**Lipids** : Classification, Digestion & Absorption, Chemistry and properties & metabolism. Cholesterol structure and metabolism, Prostaglandins.
**Lipid metabolism:** Fatty acid synthesis, fatty acid oxidation, ketogenesis. Metabolism of triglycerides and cholesterol. Lipoprotein metabolism, obesity, fatty liver, lipotropic factors, atherosclerosis and coronary heart disease and Inborn errors of metabolism.
**Nucleic acids** : Chemistry and properties – purines, pyrimidines, nucleosides, nucleotides, nucleic acids, nucleoproteins, genes and chromosomes.
**Purine, Pyrimidine metabolism:** Biosynthesis of purine and pyrimidine nucleotides. Degradation of purine and pyrimidine nucleotides.
**Hemoglobin metabolism:** Heme synthesis, Formation of hemoglobin, metabolism of bilirubin, urobilinogen, and other bile pigments.
**Methodology:** Photometry, spectrophotometry, fluorimetry, flame photometry, semi auto analyzer, pH meter, Homogenization, cell disruption, sonication, centrifugation and ultra-centrifugation, fractional distillation. General concepts regarding laboratory wares and its standardization.
**Units**: SI units- their advantages and disadvantages.
**Preparation of Reagents** : Molality, Molarity and Normality. normal and molar solution.

# SYLLABUS

## MSCMLTMB-02/ Paper - II

## M.Sc. Medical Laboratory Technology (Biochemistry).

## Enzymology, Hormones and Nutrition

### 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) **Part A -** Question No.1 and 2 are Compulsory and the candidate will attempt any four questions out of question No.3, 4,5, 6 and 7.

3) **Part B -** Question No.1 and 2 are Compulsory and the candidate will attempt any three questions out of question No.3, 4,5, 6 and 7.

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

**Question 1:** This will of 10 marks long answer question and will be compulsory. The answer must be given in at least five pages.

**Question 2:** This will consist of two short answer questions. All questions will be compulsory. The questions will carry 5 marks and 5 marks respectively and total weight-age being 10 marks.

**Question 3 to 7**

These will consist of two short answer questions. All questions will be compulsory. The questions will carry 3 marks and 2 marks respectively and total weight-age being 5 marks.

**Section B** **(Max. marks 35)**

**Question 1:** This will of 10 marks long answer question and will be compulsory. The answer must be given in at least five pages.

**Question 2:** This will consist of two short answer questions. All questions will be compulsory. The questions will carry 5 marks and 5 marks respectively and total weight-age being 10 marks.

**Question 3 to 7**

These will consist of two short answer questions. All questions will be compulsory. The questions will carry 3 marks and 2 marks respectively and total weight-age being 5 marks.

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# SYLLABUS

## MSCMLTMB-03/ Paper - III

## M.Sc. Medical Laboratory Technology (Biochemistry).

## General Physiology, Acid Base Balance and Organ Function Tests

### 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) **Part A** - Question No.1 and 2 are Compulsory and the candidate will attempt any four questions out of question No.3, 4,5, 6 and 7.

3) **Part B** - Question No.1 and 2 are Compulsory and the candidate will attempt any three questions out of question No.3, 4,5, 6 and 7.

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

**Question 1:** This will of 10 marks long answer question and will be compulsory. The answer must be given in at least five pages.

**Question 2:** This will consist of two short answer questions. All questions will be compulsory. The questions will carry 5 marks and 5 marks respectively and total weight-age being 10 marks.

**Question 3 to 7**

These will consist of two short answer questions. All questions will be compulsory. The questions will carry 3 marks and 2 marks respectively and total weight-age being 5 marks.

**Section B** **(Max. marks 35)**

**Question 1:** This will of 10 marks long answer question and will be compulsory. The answer must be given in at least five pages.

**Question 2:** This will consist of two short answer questions. All questions will be compulsory. The questions will carry 5 marks and 5 marks respectively and total weight-age being 10 marks.

**Question 3 to 7**

These will consist of two short answer questions. All questions will be compulsory. The questions will carry 3 marks and 2 marks respectively and total weight-age being 5 marks.

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## SYLLABUS

**MSCMLTMB-04/ Paper - IV**

**M.Sc. Medical Laboratory Technology (Biochemistry).**

**General Physiology, Acid Base Balance and Organ Function Tests**

**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) **Part A** - Question No.1 and 2 are Compulsory and the candidate will attempt any four questions out of question No.3, 4,5, 6 and 7.

3) **Part B** - Question No.1 and 2 are Compulsory and the candidate will attempt any three questions out of question No.3, 4,5, 6 and 7.

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

**Question 1:** This will of 10 marks long answer question and will be compulsory. The answer must be given in at least five pages.

**Question 2:** This will consist of two short answer questions. All questions will be compulsory. The questions will carry 5 marks and 5 marks respectively and total weight-age being 10 marks.

**Question 3 to 7**

These will consist of two short answer questions. All questions will be compulsory. The questions will carry 3 marks and 2 marks respectively and total weight-age being 5 marks.

**Section B** **(Max. marks 35)**

**Question 1:** This will of 10 marks long answer question and will be compulsory. The answer must be given in at least five pages.

**Question 2:** This will consist of two short answer questions. All questions will be compulsory. The questions will carry 5 marks and 5 marks respectively and total weight-age being 10 marks.

**Question 3 to 7**

These will consist of two short answer questions. All questions will be compulsory. The questions will carry 3 marks and 2 marks respectively and total weight-age being 5 marks.

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**Books Recommended:**


1. Lippincott's Illustrated Reviews of Biochemistry by Champe Harvey,3rd Edition (2007)
2. Harper's Biochemistry by Murray etal. Appleton and Lange Publishers, 27th edition, 2006
3. Text book of clinical chemistry – Teitz
4. Textbook of Biochemistry by Dr. Dinesh Puri
5. Immunology: Janis Kuby fourth edition, W H Freeman Company, USA (2000)
6. A Hand Book of Practical Immunology : GP Talwar (Vikas Publishing House, 1983)
7. Textbook of Biochemistry by Dr. Vasudevan
8. Varley's Practical Clinical Biochemistry by Alan H Gowenlock, published by CBS Publishers and distributors, India Sixth Edition
9. Practical Biochemistry – Wilson & Walker
10. Practical Biochemistry by RanjanaChawla
11. Human Physiology and Biochemistry by Dr. A. K. Jain


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# Baba Farid University of Health Sciences, Faridkot

(Meeting Branch)

Subject: **Copy of paras of the Minutes of 42nd meeting of the Board of Management held on 27.11.2015 at Mohali**

23. Considered the recommendations of the Academic Council made its 25th meeting held on 05.10.2015 vide para-14 and **RESOLVED:** To approve the fresh marks distribution alongwith subjects of Certificate & Paramedical Diploma courses and revised syllabus of Certificate course in Hospital and Home-Based Care Attendant and as under. The recommendations are within the prerogative of the Faculty of Medical Sciences/Academic Council/Board of Management, BFUHS, Faridkot and no approval is required from the Central Council i.e. Medical Council of India, New Delhi (Pages 171 to 219 of Appendices):

1. That the eligibility criteria for admission in **Paramedical Diploma courses will be 10+2 with Sciences (Medical) w.e.f. admission session 2015.** However, other rules & regulations, contained in the Ordinances & Syllabi for Paramedical B.Sc. Degree courses, shall remain same.
2. That examination (Theory and Practical) of the **Certificate Course**, it should be held at the college level. No need of External Examiner. The result will be sent to the University after completion the exam.
3. That Theory exam of the **Diploma Course** should be conducted by the University and Practical will be conducted by the college at own level. There is no need of External Examiner.
4. That **Theory & Practical examination** of the **Para Medical B.Sc Course** should be conducted by the University.
5. That Theory exam as well as Practical exam of the Para Medical **Post Graduate Diploma** Courses and **Post Graduate Courses** should be conducted by the University.
6. That name of Paramedical Certificate course in Home Based Health Care Attendant to Paramedical Certificate course in Home Based Care Helper.
7. The same (deletion of subject i.e. General/Basic Science as eligibility will be 10+2 with Science (Medical) w.e.f. 2015 admission session and fresh marks distribution) will be applicable to other Paramedical Diploma Courses too.

-Sd/-
Registrar

**Endst. No. 13-BFUHS(Meeting)284/2015/** 2999 **Dated:** 1/1/16

Copy of the above is forwarded to the following with a request to take the necessary action and send the Action Taken Report to the Meeting Branch at the earliest after approval from the worthy Vice-Chancellor:

1. The Joint Registrar (Adm. Regn.)

Registrar