

M.Sc. (Medical Biochemistry)

(Approved by the Board of Management on 28.5.2004, vide para 35 and amended on 11.11.2004, vide para 18 and on 31.1.2006, vide para 35, 36 & 64)

1. Course of M.Sc. Medical Biochemistry

- 1.1 The course for the degree of Master of Science in Medical Biochemistry shall commence in the month of July every year.
- 1.2 The course is for full time Post Graduate Students meaning thereby that the Candidate is not doing any job anywhere except he may be working as Research Assistant or Research Technician or is a full time stipendiary in the department concerned.
- 1.3 The PG students shall be required to participate in the teaching and training of the under graduate students.

2. Eligibility for admission

- 2.1 This course will be open to those candidates who have passed B.Sc. course taking Medical Anatomy, Physiology and Biochemistry as their subjects with 50% or above marks from this University.
- 2.2 Any other examination recognized by the Board of Management of this University as an equivalent course / examination thereto.
- 2.3 When any other examination other than B.Sc. Medical Anatomy, Physiology and Biochemistry is recognized as an equivalent course for admission to Master of Science in Medical Biochemistry, this University will decide the constitution and duration of 'make-up course', if any, required to be under taken by the candidate before taking up M.Sc. Medical Biochemistry course.

3. Selection of the Candidates

Candidates for M.Sc. Medical Biochemistry course shall be selected strictly on the basis of their Academic Merit. For this purpose the cumulative performance of the students in their graduation examination shall form the basis of their merit. The minimum marks being 50% for all the candidates.

4. Period of Training

The period of training before appearing in the M.Sc. Medical Biochemistry examination shall be two completed years including period of examination.

5. Medium of Instruction

The medium of Instruction during training and in the examination shall be English.

6. Methods of Training

The training shall be aimed at emphasising the theoretical and practical aspects of the subject. Seminars, Group Discussions, Journal Clubs and other such activities should be encouraged. Efforts should be made to train the candidate to fit properly into the future role as a Teacher or as a Research worker.

6.1 Theory

Paper I Molecular Biology

Nucleic acids-structure and function; organisation, replication and synthesis of DNA; Transcription and synthesis of RNA; genetic code. Translation and synthesis of proteins; gene expression, recombinant DNA and biotechnology- cloning, gene-mapping and therapy.

Paper II Immunochemistry

Immune system; Immunoglobulins-structure and function; Antigenicity. Antigen-antibody reactions. Autoimmunity. Cell mediated immunity. Histocompatibility antigens; clinical immunology, Estimation of immunoglobulins.

Paper III Nutrition and Dietetics

Introduction: energy requirements; Basal metabolic rate; specific dynamic action. Balanced diet; Caloric and Nutritive value of foods; infant nutrition; Nutrition and fertility; Protein-caloric value; malnutrition- kwashiorkor and marasmus, Recommended dietary allowances in health and disease, Bio-chemistry of ageing, toxicants in foods.

Paper IV Clinical Biochemistry and Medical Statistics

Metabolic disorders of carbohydrate, lipids, nucleic acids, proteins, hormones, Vitamins and minerals; inborn errors, blood and its disorders, clinical enzymology, quality control and Laboratory methodology, acid base balance, water balance. Elementary knowledge and medical statistics. Recent advances in Biochemistry.

6.2 Practical

1. Measurement of pH.
2. Isolation and identification of glycogen.
3. Isolation and estimation of lipids from tissues.
4. Isolation and determination of DNA and RNA from tissues.
2. Paper Electrophoresis.
3. Chromatography.
4. Kinetics of Enzymes.
5. Liver Function tests.
6. Kidney function tests.
7. Sub-cellular fractionation.

8. CSF analysis.
9. Analysis of Barbiturates and salicylates.
10. Flame photometry.
11. Estimation of hormones
12. Estimation of tumour markers
13. Estimation of drugs
14. Use of blood gas analyser

6.3 Examination and Marks

The examinations shall consist of:

1. Thesis
2. Theory Papers
3. Practical and Oral Examination
4. Internal Assessment

6.4 Thesis

- (i) Every candidate shall submit a thesis plan to the University within nine months from the date of admission. *(Amended by BOM on 31.1.2006, vide para 64).*
- (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 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 result 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 1/2") with margins of 1 1/2" 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.

6.5 Theory Papers

- a) At the end of the course, the theory examination shall be held sufficiently earlier than the practical examination so that the answer books can be assessed and evaluated before the start of the practical and oral examination
- b) There shall be four theory papers of 100 marks each.

Paper I	:	Molecular Biology
Paper II	:	Immuno-chemistry
Paper III	:	Nutrition and Dietetics
Paper IV	:	Clinical Biochemistry and medical statistics

6.6 Practical and Oral Examination

The practical and oral examination shall be conducted and completed in two days.

- a) Practical examination in the subject of Biochemistry shall be conducted to test the knowledge and competence of the candidate for undertaking independent work as a teacher or a research worker in the speciality. He shall also be tested for making valid and relevant observations based on experimental / laboratory studies and his ability to perform such studies as are relevant to his subject.

Marks : There will be 200 marks for the practical examination.

- b) The oral examination shall be thorough and aimed at assessing the knowledge and competence about the subject, investigative procedures, and other aspects of the speciality, which form a part of the examinations.

Marks : There will be 100 marks for the oral examination out of these marks 50% marks will go to theory and the other 50% marks will be added to practical marks.

6.7 Internal Assessment Marks

The internal assessment marks should be based on the candidates' performance in house tests conducted during his stay/training.

Marks :	Theory	50 marks
	Practical	50 marks

7. Eligibility to appear in the examination

A candidate who fulfils the following requirements during the course of his training shall be eligible to appear in the examination:

- has successfully completed his stay of two years of training.
- has attended not less than 80% of the training (theory as well as practical) during each calendar year.
- has 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. The re-appear/fail students will not be re-assessed every time for the purpose of Internal Assessment and their previous score of assessment will be carried forward (*added by Board of Management on 11.12.2004, vide para 18 and BOM on 31.1.2006, vide para 35*)
- has submitted his thesis as per guidelines issued by the University and thesis should have been accepted.
- has submitted a certificate signed by the Head of Department that he has successfully completed the assignments as detailed in the curriculum during the course of two years to the satisfaction of the HOD.
- has submitted a certificate signed by the HOD that he possesses a good moral and professional character.
- a person who has completed his training of two years and has failed in the examination may appear again in a subsequent supplementary/annual examination without further training and without submitting a new thesis.

8. Schedule for submission of examination admission form

The last date by which the examination admission forms along with examination fee of Rs.3000/- to be submitted to the Registrar, shall be as follows:

Examination	without late fee	with late fee of Rs. 200/-	with late fee of Rs. 500/-	with late fee of
M.Sc. Medical				
Biochemistry				
May/June	March 1	March 15	March ?	
Nov./Dec.	Sept. 15	Sept. 30	Oct. 15	

Vice-Chancellor may permit acceptance of admission form before the commencement of examination with a late fee of

9. 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.

10. Board of Examiners

- 10.1 The examination shall be conducted by a Board of four examiners on the recommendations of the faculty of medical sciences.
- 10.2 All the PG Examiners should be recognized PG Teachers holding recognized PG qualifications in the subject.
- 10.3 Out of the four examiners two shall be external examiners who shall be invited from other recognized Universities from outside the state.
- 10.4 Under exceptional circumstances, examination may be held with three examiners provided two of them are external and the Medical Council of India is intimated the justification of such action prior to the publication of the result for approval.
- 10.5 The teachers possessing M.Sc. & Ph.D. Degree from Punjab Agricultural University shall not be appointed Examiners as they are not eligible to be appointed as Teachers in Medical Institutions. *(Inserted by BOM on 31.1.2006, vide para 36).*

11. 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% marks in theory as well as practical and oral examinations 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
Distinction	:	A candidate obtaining 75% or more marks

12. Grace Marks

There shall be no provision for grace marks.

13. Award of Degree

Each successful candidate shall be awarded a degree.
