
CURRICULUM/ STATUTES & REGULATIONS

For

2 YEARS CONDENSED COURSE

IN

MEDICAL LABORATORY TECHNOLOGY



2009

**UNIVERSITY OF HEALTH SCIENCES
LAHORE, PAKISTAN**

Two Years Condensed Course in Medical Laboratory Technology

Introduction:

Two years Condensed Course in Medical Laboratory Technology is directed towards medical technologists who would like to improve their qualifications. The subjects included in Condensed Course in Medical Laboratory Technology are **Basic Physiology, General Pathology & Cytology, Behavioral Sciences & Computer Education, Biostatistics & Research Methods**. The integration of these courses will provide the students with comprehensive knowledge to meet the educational needs of students who can be employed as medical technologists in medical laboratories, biotechnology and medical research as well as in tertiary care hospitals.

Aims:

In the light of enhancement in the duration of B.Sc. Medical Laboratory Technology Course to 4 years since session 2007-08, it was decided in the meeting of Board of Studies in Allied Health Sciences held on 10th April, 2009 that 2 years duration additional course for MLT Degree may be developed. On successful completion of the additional course the students may be awarded a degree of B.Sc. (Hons.) in Medical Laboratory Technology to facilitate them to compete for M.S and Ph.D scholarships of Higher Education Commission requiring 16 years of education.

The aim of the 2 years condensed Course in Medical Laboratory Technology is to equip the students with relevant professional knowledge, skills, techniques and ethical values to enable them to apply their acquired expertise at level between the clinicians and the patient for efficient health service delivery.

Admission Requirements:

Condensed Programme in Medical Laboratory Technology is highly competitive. For admission, a candidate must have already cleared:

- All Professional Examinations for B.Sc. Medical Laboratory Technology (2-years) Programme
- Interview

Program of Study:

Duration of Condensed Course shall be two years and will include classroom lectures, laboratory exercises, rotation in all disciplines of pathology and preparation of a Research Report in the area of interest in consultation with the supervisor. All students must complete course work and submit their research report within the prescribed time limit of their study periods (two years).

The curriculum is designed to allow students to achieve the following objectives:

- To obtain up-to-date knowledge of foundations and recent advances in laboratory medicine.
- To develop the ability to apply basic knowledge of laboratory medicine and basic sciences to advanced laboratory specialties.
- To demonstrate competence in research theory and methodology in order to solve laboratory problems as economically and expeditiously as possible.
- To acquire concepts of lab management, quality assurance and administrative skills.

The curriculum is constructed to allow students to work in all disciplines of pathology laboratory and to move to their area of specialization. Keeping in mind the fact that the medical laboratory technologist must be able to apply latest concepts and techniques of basic laboratory medicine so that the recent advances in this area are also covered.

Plan of Study:

All students shall undergo rotation in five disciplines of Pathology (Haematology & Transfusion Medicine, Microbiology, Chemical Pathology, Immunology and Histopathology) during the 1st year of their education. A satisfactory report from the concerned supervisor of student is compulsory. By the start of 2nd year the students will also select a topic of research and prepare a Research report for submission by the end of the academic year.

Curriculum for Condensed Course in Medical Laboratory Technology:

The courses in the following subjects are compulsory for all students during the 1st academic year.

1. Basic Physiology

2. General Pathology & Cytology

3. Behavioral Sciences & Computer Education

The course in the following subject is compulsory for all students during the 2nd academic year.

▪ Biostatistics & Research Methods

During 2nd year each student shall select a topic of research for preparation of research report in consultation with his/her supervisor and shall prepare and submit the research Report to UHS by the end of 2nd year.

For this purpose he /she shall be deputed for one year in one of the following specialties: Haematology & Transfusion Medicine, Microbiology, Chemical Pathology, Immunology, Histopathology, Molecular Biology and Cytogenetics and prepare research report.

Internal Assessment:

Attendance in both theory as well as in practical classes is essential. Students with less than 75% attendance will not be allowed to take the final examinations. All the students will be examined in their respective disciplines and their performance shall be evaluated in following ways:

1. Punctuality
2. Practical work
3. Participation in interactive sessions
4. Regularly conducted class tests

Final Examinations:

At the end of course work and laboratory rotations for the academic year each student with satisfactory attendance report shall be allowed to take the final examination. The format of written examinations paper shall be in the form of MCQs (Multiple Choice Questions) and SEQs (short essays questions).

1) FIRST PROFESSIONAL EXAMINATION (AT THE END OF 1st YEAR OF MEDICAL LABORATORY TECHNOLOGY CONDENSED COURSE)

<u>Paper</u>	<u>Subjects</u>	<u>Allocated Marks</u>
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Paper-I

Basic Physiology

Theory	90 Marks
Internal Assessment	10 Marks

Total Marks=100

Paper-II

General Pathology & Cytology

Theory	90 Marks
Internal Assessment	10 Marks

Total Marks=100

Paper-III

Behavioral Sciences & Computer Education

Theory	90 Marks
Internal Assessment	10 Marks

Total Marks=100

2) SECOND PROFESSIONAL EXAMINATION (AT THE END OF 2nd YEAR OF MEDICAL LABORATORY TECHNOLOGY CONDENSED COURSE)

Paper-I

Biostatistics & Research Methods

Theory	90 Marks
Research Report	90 Marks
Internal Assessment	20Marks

Total Marks=200

NOTE:

- I. The minimum number of marks required to pass Professional Examination for each subject shall be fifty percent (50%) in Theory, fifty percent (50%) in the Oral & Practical examination and fifty percent (50%) in the aggregate at one and the same time.
- II. The continuous internal assessment shall contribute 10% to the total allocated marks for each subject. These marks will be equally distributed to the final Theory and Oral & Practical Examinations scores.

OUTLINE OF TESTS

First Professional Examination

Total marks: 300

The First Professional Examination shall be held at the end of first academic year and shall consist of the following subjects:

Paper-I: Basic Physiology

Total Marks: 100

The examination in the subject of Basic Physiology shall consist of one theory paper of three hours duration and of maximum **90 marks**. The syllabus to be covered is mentioned in Appendix "A".

There will be **09 SEQs** from the subject of Basic Physiology and there will be no choice. Each short essay question will carry **05 marks**.

There will be **45 MCQs** and each question will carry **01 mark**.

Paper-II: General Pathology & Cytology

Total Marks: 100

The examination in the subject of General Pathology & Cytology shall consist of one theory paper of three hours duration and of maximum **90 marks**. The syllabus to be covered is mentioned in Appendix "A".

There will be **06 SEQs** from General Pathology portion & **03 SEQs** from Cytology and there will be no choice. Each short essay question will carry **05 marks**.

There will be **45 MCQs** and each question will carry **01 mark**. Out of these **30 MCQs** shall be from General Pathology portion and **15 MCQs** from Cytology.

Paper-III: Behavioural Sciences & Computer Education

Total Marks: 100

The examination in the subject of Behavioural Sciences & Computer Education shall consist of one theory paper of two hours duration and of maximum **90 marks**. The syllabus to be covered is mentioned in Appendix "A".

Theory paper shall consist of 90 **MCQs** and each question will carry **01 mark**. Out of these **45 MCQs** shall be from Behavioural Sciences portion and **45MCQs** from Computer Education.

Second Professional Examination

Total marks: 200

Paper-I: Biostatistics & Research Methods

Total Marks: 200

The written examination in the subject of Biostatistics & Research Methods shall consist of one theory paper of three hours duration and of maximum **90 marks**. Internal assessment shall be of **10 Marks**. The syllabus to be covered is mentioned in Appendix "A".

There will be **09 SEQs** from the subject of Biostatistics & Research Methods and there will be no choice. Each short essay question will carry **05 marks**.

There will be **45 MCQs** and each question will carry **01 mark**.

Oral & Practical examination in the subject shall be in the form of a Research Report of maximum 100 Marks. The research report shall be submitted to the UHS by the end of 2nd academic year for the evaluation and examination. Research report shall be sent to the external examiner by the UHS and on approval of the examiner the student shall defend his/her research report.

STATUTES & REGULATIONS FOR MEDICAL LABORATORY TECHNOLOGY CONDENSED COURSE

STATUTES:

1. The Syllabi and Courses of each subject are given in Appendix "A".
2. The Outline of Tests and the Syllabi and Courses of Studies can be modified from time to time by the Academic Council with the approval of the Syndicate and the Regulations by Board of Governors.
3. The duration of the course shall be of two year.
4. The admission to Medical Laboratory Technology Condensed Course shall be carried out in the prescribed manner.
5. There shall be three subjects i.e., **Basic Physiology, General Pathology & Cytology** and **Behavioural Sciences & Computer Education** during the 1st year. Examination of these subjects will be held at the end of the 1st academic year.
6. There shall be one subject i.e., **'Biostatistics & Research Methods'** during the 2nd year. The theory and oral & practical examination of this subject will be held at the end of the 2nd academic year.
7. The research work and writing of research report in area of specialization will be completed during the 2nd academic year. The research report examination shall be conducted at the end of the 2nd academic year.
8. The candidate shall be eligible to appear in the examination if he/she has registered himself/herself as a student of Condensed Course in Medical Laboratory Technology in accordance with the admission regulations and fulfills the requirements of attendance and course work.
9. The degree of B.Sc. Medical Laboratory Technology (Hons.) shall be conferred on a person who holds B.Sc. Medical Laboratory Technology (2-years duration) degree and has passed Medical Laboratory Technology Condensed Course Examinations.
10. The Oral & Practical Examination shall be conducted by one external examiner and one internal examiner.
11. The research report shall be evaluated by an external examiner appointed by UHS.

REGULATIONS:

1. GENERAL REGULATIONS

- (i) Academic requirements for Condensed Course in Medical Laboratory Technology shall comprise course work, lab rotations and a research report carried out during the 2nd year.
- (ii) Each student shall follow the Syllabi and Courses of Studies as may be prescribed by the Board of Studies Allied Health Sciences from time to time with the approval of the Syndicate.
- (iii) Prescribed courses for each academic year and the research report shall be completed within the specified time limit.

- (iv) Students shall be required to pay tuition fee and such other dues as may be determined by the Institution.
- (v) The candidate shall be awarded the degree of B.Sc. (Hons.) Medical Laboratory Technology after successful completion of all subjects of studies, qualifying all examinations and fulfilling all other requirements (lab rotation & research report).

2. REGULATIONS FOR ADMISSION

- (i) Admission process will be organized and completed by the Affiliated Institution.
- (ii) There shall be an Admission Committee to supervise admissions.
- (iii) Admissions shall be made strictly on the basis of merit. However the Institution may prefer its own B.Sc. Medical Laboratory Technology (2-Years) degree holders and candidates with practical experience.
- (iv) To be eligible for admission to Condensed Course in Medical Laboratory Technology, a candidate shall be required to possess a B.Sc. Medical Laboratory Technology (2- years Course) degree from a HEC recognized University.
- (v) For admission, a candidate must have already cleared:
 - All Professional Examinations for B.Sc. Medical Laboratory Technology (2-years) Programme
 - Interview

A detailed CV along with 2 letters of references must be submitted with the application form.
- (vi) The Principal/Head of the Institution shall finally approve the admissions in the light of recommendations made by the Admission Committee.
- (vii) The number of students each year for admission shall be decided by the Admission Committee headed by the Principal/Head of the institution.
- (viii) Each candidate shall submit application for admission in response to advertisement, on a prescribed form along with documents specified in the admission form.
- (ix) A candidate who is in Government service will apply through proper channel.
- (x) Students dropped or struck off the rolls of the Institution due to shortage of lectures or poor performance or non appearance in examination or non-payment of dues or on disciplinary grounds etc. shall not be granted re-admission.
- (xi) Any student, who was rusticated, expelled or whose entry in the Institution was banned for any reason whatsoever, shall not be re-admitted.
- (xii) The following shall not be eligible for admission:
 - a. Anyone who has been rusticated or expelled by the Institution for misconduct or use of unfair means in the examinations or any offence involving moral turpitude.
 - b. Any one who was earlier admitted to Condensed Course in Medical Laboratory Technology but was later declared to have

ceased to be a student of the Institution under the prescribed regulations.

- (xiii) All admissions made in contravention of these Regulations shall be void.

3. REGULATIONS FOR STUDIES AND EXAMINATIONS

- (i) The students of Condensed Course in Medical Laboratory Technology shall be assessed monthly for their performance in academic activities, punctuality and discipline. Monthly report of each student shall be submitted to the Principal/Head of the Institution by the programme coordinator.
- (ii) Any student who fails to achieve satisfactory assessment report will be given warning and his case will be referred to Admission Committee for further necessary action.
- (iii) Examinations of Condensed Course in Medical Laboratory Technology shall be held twice a year (Annual & Supplementary) on a prescribed schedule.
- (iv) The date sheet to hold the examination shall be notified by the Controller of Examinations in consultation with the Allied Health Sciences Institutions conducting the course.
- (v) A student shall be allowed to appear in the examination, provided he/she has been registered by the University during the session and has attended at least 75% of the lectures/lab rotations and completed the course work to the satisfaction of the institution.
- (vi) Written Examinations for Condensed Course in Medical Laboratory Technology shall be based on MCQs & SEQs pattern. The MCQs paper will have the format of single best answer.
- (vii) The minimum number of marks required to pass Professional Examination for each subject shall be fifty percent (50%) in Theory, fifty percent (50%) in the Oral & Practical examination and fifty percent (50%) in the aggregate at one and the same time.
- (viii) The continuous internal assessment shall contribute 10% to the total allocated marks for each subject. These marks will be equally distributed to the final Theory and Oral & Practical Examinations scores.
- (ix) The candidate shall have to pass each of the Professional Examinations for the Condensed Course in Medical Laboratory Technology in a maximum of four consecutive attempts, availed or un-availed, after becoming eligible for the first examination.
- (x) A candidate who fails to clear each of the Professional Examinations for Condensed Course in Medical Laboratory Technology even after availing **four** chances shall cease to be a student of the University and shall not be eligible for another attempt.
- (xi) Candidates who secure eighty percent (80%) or above marks in any subject shall be declared to have passed "with distinction" in that subject and no candidate who does not pass in all the subjects of a Professional Examination as a whole at one and the same time shall be declared to have passed "with distinction" in any subject.

- (xii) A student obtaining first position in the final shall be awarded a '**Certificate of Merit**' by the UHS provided that he/she obtains a total of at least 75% marks and has passed all the examinations in first attempt and has completed the entire requirements for Condensed Course in Medical Laboratory Technology within the prescribed duration.

4. REGULATION FOR THE APPOINTMENT OF EXAMINERS IN THEORY

- (i) The Institution shall recommend internal examiner, paper setters and paper assessors in the concerned subject and forward it to the Controller of Examinations UHS for approval.
- (ii) The Controller of Examinations shall have the final authority to appoint an internal examiner, paper setter, paper assessor and external examiners in theory as well as Practical & Oral examination.
- (iii) The external examiner shall be an allied health teacher in any University/Hospital within Pakistan or a college affiliated with the University or any other recognized academic institution.
- (iv) No person shall be appointed as examiner who has near relation i.e., father, mother, full and half brother and sister, paternal and maternal uncle, father-in-law, mother-in-law, brother-in-law, sister-in-law, son-in-law, daughter-in-law, wife, son, daughter or husband appearing in the paper to be set or examined by him/her.
- (v) The award list of the practical examination shall be submitted to the Controller of Examinations by both internal and external examiners independently.
- (vi) The Controller of Examinations shall compile and declare the results on the basis of evaluation record in theory and practical examinations submitted by the examiners strictly in accordance with the regulations.

5. RESEARCH WORK & APPOINTMENT OF SUPERVISOR

- (i) A student shall select a topic of research report which will be finally recommended by the supervisor.
- (ii) Each student shall perform research work under the supervisor appointed for the purpose by the Principal/Head of the Institution.
- (iii) The research supervisor must hold a degree which shall not be less than B.Sc. (Hons.) Medical Laboratory Technology/M.Sc. in the relevant subject with sufficient experience.
- (iv) The student is required to submit the research report of **10-15 pages**.
- (v) A copy of the research report shall be kept by the library of the Institution.
- (vi) The research report shall be submitted to the UHS at the end of academic year for the evaluation and examination. Research report shall be sent to the external examiner by the UHS and the student shall defend his/her research report in Oral & Practical examination.

6. STUDENTS DISCIPLINE

- (i) The progress report of each student shall be prepared that will contain academic progress, attendance and behavior. Progress report will be submitted to the Principal/Head of the Institution.
- (ii) All the students shall abide by the Rules, Regulations and Statutes of the Institution and follow all directives issued from time to time.
- (iii) No students shall, through document or by any communication, approach the press in his/her own name or through an association.
- (iv) No student shall take part in political activities or form union, association or any other
- (v) Violation of these rules shall entail rustication/expulsion under the provisions of the Institution.

7. FEES & OTHER DUES

Each student shall be required to pay registration and tuition fees, examination fee and such other charges as may be prescribed by the Institution and the University from time to time.

SYLLABI & COURSES

First Professional Examination for Condensed Course in Medical Laboratory Technology

PAPER I: BASIC PHYSIOLOGY

Study Hours: 100

(1) Introduction To The Human Physiology

- Functional organization---relationship between structure and function of the human body
- Homeostasis – its importance-- negative and positive feedback mechanisms

(2) Integumentary System

- Functions of the skin, hair, glands and nails
- Body temperature and its regulation

(3) The Musculoskeletal System:

- Functions of the bones and muscles
- Functional characteristics of Skeletal Muscle, Smooth Muscle and Cardiac Muscle
- The events of muscle contraction and relaxation in response to an action potential in a motor neuron.
- Distinguish between aerobic and anaerobic muscle contraction.
- Muscle hypertrophy and atrophy

(4) The Nervous System

Functions of the central nervous system,

- The functional areas of the cerebral cortex and their interactions.
- Functions of the parts of the brainstem, diencephalon, basal nuclei, limbic system and cerebellum.
- Functions of various cranial nerves.
- **Functions of the somatic motor nervous system**
- **Functions of the autonomic nervous system**

- The function of neurons, neuroglial cells and their components.
- Resting membrane potential and an action potential.
- The function of a synapse and reflex arc

(5) The functions of the specialized sense organs

- Eye---- physiology of vision, accommodation, optic nerve and optic chiasma
- Ear---- functions of the internal, middle and external ear
- Physiology of the hearing and balance
- Smell----- physiology of olfaction
- Taste ----- location of taste buds , physiology of taste
- Physiology of speech

(6) The Endocrine System

- Functions of the Endocrine System
- Chemical Signals, receptors and hormones
- The Endocrine Glands and their Hormones
- Other Hormones

(7) Blood

- Composition of Blood and Plasma
- Functions of Blood
- Formed Elements
- Stages of cell development
- Blood grouping
- Coagulation mechanism

(8) The Cardiovascular system

- Functions of the Heart
- Electrical Activity of the Heart----origin and propagation of cardiac impulse
- Phases of the Cardiac Cycle
- Heart Sounds
- Regulation of Heart Functions--- intrinsic and extrinsic
- Functions of the Peripheral Circulation
- The Physiology of Circulation
 - Pulmonary Circulation
 - Systemic Circulation: Arteries & Veins
- Local Control of Blood Vessels
- Nervous Control of Blood Vessels
- Regulation of Arterial Pressure
- The function of Lymphatic System--tonsils, lymph nodes, spleen and thymus.

(9) Respiratory System

- Functions of the Respiratory System---beginning at the nose and ending with the alveoli.
- Ventilation and Lung Volumes
- Gas Exchange and gas transport in the blood
- Rhythmic Ventilation

(10) The Digestive System

- Functions of each organ of the Digestive System including major salivary glands
- Movements and Secretions in each organ of the Digestive System and their regulation
- Physiology of Digestion, Absorption and Transport of food

(11) Genito-Urinary System

- Urine Production, Urine Movement
- Regulation of Urine Concentration and Volume
- Body Fluid Compartments
- Regulation of Extracellular Fluid Composition
- Regulation of Acid-Base Balance
- Physiology of Male Reproductive system—spermatogenesis, reproductive glands, hormones and their regulations
- Physiology of Female Reproductive system--- ovulation, hormones and their regulations

(12) Immunity

- Define immunity, Innate Immunity, Adaptive Immunity.
- Antigens and Antibodies
- Primary and secondary responses to an antigen
- Antibody-mediated immunity and cell-mediated immunity
- Role of lymphocyte in immunity regulation

Recommended Books

- Essentials of Anatomy and Physiology by Seelay, Stephens and Tate. 4th edition
- Ross & Wilson Anatomy and Physiology.
- Human Physiology. Stuart Ira Fox. 7th edition
- Text Book of Medical Physiology Guyton
- Essential of Medical Physiology Vol.I & II by Mushtaq Ahmad.
- Lecture notes on human physiology by Bray JJ, Cragg, PA MacKnight

PAPER II: GENERAL PATHOLOGY & CYTOLOGY

Study hours: 100

GENERAL PATHOLOGY

Cell Injury and adaptation

Cell Injury

- Reversible and Irreversible Injury
- Fatty change, Pigmentation, Pathologic calcification
- Necrosis and Gangrene

Cellular adaptation

- Atrophy, Hypertrophy
- Hyperplasia, Metaplasia, Aplasia

Inflammation

- **Acute inflammation** ----vascular changes, Chemotaxis, Opsonization and Phagocytosis
 - Enlist the cellular components and chemical mediators of acute inflammation.
 - Differentiate between exudates and transudate.
- **Chronic inflammation**----Etiological factors, Granuloma

Cell repair and wound healing

- Regeneration and Repair
- Healing--- steps of wound healing by first and second intention
- Factors affecting healing
- Enlist the complications of wound healing

Haemodynamic disorders

- Define and classify the terms Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia with at least two examples of each.
- Define and classify Shock with causes of each.
- Describe the compensatory mechanisms involved in shock.
- Describe the possible consequences of thrombosis.
- Describe the difference between arterial and venous emboli

Neoplasia

- Define the terms Dysplasia and Neoplasia with examples of each.
- Enlist the differences between benign and malignant neoplasms.
- Enlist the common etiological factors for neoplasia.
- Define and discuss the different modes of metastasis.

Recommended Books

Pocket companion to Robbins. Pathologic basis of disease Cotran,
Kumar, Collins

CYTOLOGY

- Cell and its structure, classification of cells and tissues
- Basic principles of exfoliative cytology
- Exfoliation, sites from which exfoliated cells can be obtained and methods for obtaining them
- Pathologic processes affecting cell morphologies:
 - Inflammation, Repair and regeneration, benign and malignant tumors
- Female genital tract.
 - Methods for obtaining smears and their fixation
 - Pap's and Giemsa's staining
 - Normal cells of female genital tract
 - Abnormal cells other than malignant cells
 - Diagnosis of carcinoma of male genital tract
- Respiratory tract:
 - Method for obtaining smears and their fixation
- Cytologic techniques for
 - Urinary tract
 - G.I. tract
 - Circulating blood and aspirating smears.
- Immunocytochemistry
 - Introduction and significance
 - Methods of Immunocytochemistry: Direct and Indirect
 - PAP / Avidin Biotin method
 - Steps involved in Immunocytochemistry (starting from fixation to the final chromogen application)
 - Antigen retrieval methods
 - Types of buffering media, enzyme labels and chromogens used in Immunocytochemistry

Paper-III: BEHAVIOURAL SCIENCES & COMPUTER EDUCATION

Study Hours: 100

BEHAVIOURAL SCIENCES

1. Introduction to Behavioural Sciences and its importance in health.

- Bio-Psycho-Social Model of Health Care and the Systems Approach
- Normality vs. Abnormality
- Importance of Behavioural sciences in health
- Desirable Attitudes in Health Professionals

2. Understanding Behaviour

Sensation and sense organs

Describe sensation, sense organs/special organs

Perception

Define perception, factors affecting perception

Attention and concentration

Define attention and concentration, factors affecting them.

Memory

Define memory and describe its stages, types and methods to improve it.

Thinking

Define thinking; describe its types and theories

What is cognition and levels of cognition?

Discuss problem solving and decision making strategies

Communication

Define communication. What are types, modes and factors affecting it?

Describe ways to recognize non-verbal cues. Give characteristics of a good communicator.

3. Individual Differences

Personality

Define personality. What factors affect personality development? How personality can be assessed? Influence of personality in determining reactions during health, disease, hospitalization, stress

Intelligence

Define intelligence and the various types of intelligence.

What factors affect it and how it can be assessed?

Emotions

Define emotions. What are the various types of emotions?

Emotional Quotient (EQ) - concept & utility

Motivation

Define motivation and what are the types of motivation?

4. Learning

Define learning, Principles of learning, modern methods and styles of learning, types of learners, Strategies to improve learning skills

5. Stress and Stressors

Define and classify stress and stressors
Relationship of stress and stressors with illness

6. Life Events

Concept of life events and their relationship with stress and illness

7. Stress Management

What is coping skills?
What is conflict and frustration?
What is concept of adjustment and maladjustment?

8. Interviewing / Psychosocial History Taking

Define, types of interview and listening
Skills of interviewing and listening

9. Allied Health Ethics-Hippocratic oath

Do's and Don'ts
What is the concept of Allied Health ethics?

10. Culture and Allied Health practice

Concept of group, its dynamics
Attitude, value, belief, myths, social class, stigma, sick role and illness,
health belief models

11. Psychological reactions

Grief and bereavement, Family and illness
Dealing with difficult patients
What are the psychosocial aspects of illness, hospitalization, rape, torture, terminal illness, death and dying?
Psychosocial issues in Emergency Departments, Intensive Care and Coronary Care Units, Operating Theatres, Cancer wards, Transplant Units, Anaesthesia

12. Breaking Bad News

Introduction, Models, Methods, Death of the patient, abnormal baby, intractable illness

13. Pain, Sleep, Consciousness

Concept of pain.
Physiology of pain,

Altered states of consciousness.

14. Communication Skills

Counseling,

Crisis Intervention

Conflict Resolution

Principles of effective communication, active listening, the art of questioning

The art of listening.

Good and bad listener.

Counseling: Scope, Indications and Contraindications,
Steps, Do's and Don'ts, How to deal with real life crisis and
conflict situations in health settings

COMPUTER EDUCATION

INTRODUCTION TO COMPUTERS

- Definition
- Usage and functionality of computers
- Limitations of Computers
- Classification of Computers
- Basic Components of Computers
- Hardware

SOFTWARE

- System Software
- Application Software
- Equipment's/devices in Personal computer system
- Input devices
- Output devices
- Storage devices
- The processor

MICROSOFT WINDOWS

- Introduction to MS-Windows
- Arranging, Moving and Resizing Windows.
- Identifying the components of desktop.
- Moving, Changing and Closing Windows.
- Crating, Opening and Deleting items and folders.
- Working with My Computer
- Deleting and Resume Print Jobs.
- Using Control Panel
- Working with Accessories.

MICROSOFT OFFICE

- Microsoft Win Word
- Microsoft Excel
- Microsoft Power Point

DATABASE

INTERNET AND EMAIL

- Introduction To Outlook Express
- Using Internet Explorer

Second Professional Examination for Condensed Course in Medical Laboratory Technology

Paper-I: BIOSTATISTICS & RESEARCH METHODS

Theory Hours:	100
Practical Hours:	200

CONTENTS OF THE COURSE

1. **Introduction of Statistics:** Statistical data condensation of data, presentation of data by graphs, health related data, rates and their relative importance, presentation of quantitative data.
2. **Sampling:** The concept of sampling, types and methods of drawing ideal sample, sampling distribution of sample mean, error of sampling, standard error, chi square, T-test and their uses in health.
3. **Central Tendency:** Concepts of central tendency, mean, median and mode and their value in health, percentiles, measure of dispersion, coefficient of variation and skewness, normal distribution, range, standard deviation and relative deviation.
4. **Hypothesis:** Concepts of hypothesis testing, null & alternative hypothesis, two types of errors, acceptance & rejection regions, two sided & one sided tests, general steps in hypothesis testing, test about means, confidence interval for mean, meaning of significance in statistical procedures and methods of inferential statistics.
5. **Regression & Correlation:** Scatter diagram, straight line regression model, method of least squares, sample correlation coefficient, inference about regression coefficient and correlation coefficient.
6. **Introduction to Research:** The question of legitimate knowledge, knowledge & decision making, the scientific method, quantitative vs. qualitative research, application of scientific method, positivistic vs. naturalistic paradigm.
7. **Classification of Research:** Basic vs. applied research, evaluation research, research & development (R&D), action research.
8. **Selection & Formulation of a Problem:** From generic to a specific program, program statement, getting an access to primary and secondary resources, note taking and information to management, Review of related literature, questions and/or hypothesis of the study.

9. **Development of a Research Plan:** The ethical, legal and professional obligations, the rationale of the study, the research plan, evaluation of a research plan.
10. **Selection of sample:** sample & population, basic considerations in sampling, random sampling, stratified random sampling cluster sampling, systematic sampling determination of sample size, and elimination of sampling bias.
11. **Instrumentation and Data Collection:** Tests and scales, objectivity and standardization, types of tests and scales, validity and reliability of an instrument, assessment of validity and reliability, development of tests/scale.
12. **Data Analysis & Interpretation:** Preparing data analysis, types of measurement scales, descriptive statistics inferential statistics, using computer for data analysis.
13. **Preparation of a Research Report:** Format & style, citation, references & bibliography writing theses, dissertations & journal articles.

RECOMMENDED BOOKS AND JOURNALS FOR FURTHER STUDIES

- Essential Hematology By Hoffbrand A.V And Pettit
- Practical Hematology By Dacie And Lewis
- Clinical Pathology Interpretations by A.H. Nagi
- Clinical Hematology In Medical Practice By De- Gruchy's
- Handbook of Hematology and Blood Transfusion Techniques by JW Delancy
- Manual of Laboratory Medicine by AFIP, Rwp.
- District Laboratory Practice In Tropical Countries: Part I & II By Monica Cheesburgh
- Medical Microbiology And Immunology By Levinson And Jawetz
- Textbook Of Clinical Chemistry By Warley
- A Manual Of Laboratory And Diagnostic Tests By Francis Talaska
- Text Book Of Clinical Chemistry by Zilva Pannel
- Short Textbook Of Chemical pathology by Baron
- Clinical Chemistry In Practical Medicine by Stewart And Dunlopp
- Immunology By Roih, Brostoff And Male (6th Edition)
- Immunobiology (The Immune System In Health And Disease By Janeway, Travers, Walport & Shlomohick (6th Edition)
- Immunology By Abbas
- Fundamental Immunology (5th Edition) By William E Paul
- Practical Medical Microbiology by Sherrys
- Guide To Human Parasitology by Black Lock
- Medical Bacteriology: A Practical Approach by Peter Hawky
- Basic Medical Lab Technology by CJ Kirk and RN Peel
- Theory and Practice Of Histological Techniques by John D Bancroft
- Educational Research: Competencies For Analysis And Applications Columbus: Merrill. Gay. L.R. (1987) Walpole, R.E.:
- Introduction to Statistic, Publishing Co. Inc, New York.
- Spiegel, Murray R.: Theory & Problems of Statistics, Sehawm Publishing Co., New York.
- Park's; Text Book Of Preventive And Social Medicine