B.Sc. in Medical Laboratory Technology (BMLT)

Semester Wise Distribution of Subjects

Total Credits= 120; Total Marks=4000

Semester	Code No.	Subject	Credits		Total Credits	Internal Marks (60)		Semester Marks (140)		Total Marks	Total Contact hours	
			Theory	Practical		Theory	Practical	Theory	Practical		Theory	Practical
1st Semester	BMLT-101	Basic sciences I Anatomy/Physiology	4	1	5	40	20	100	40	200	72	36
	BMLT-102	Basic sciences II	4	1	5	40	20	100	40	200	72	36
	BMLT-103	English/Terminology/ Ethics/ Computer	4	1	5	40	20	100	40	200	72	36
	BMLT-104	Biostatistics/ Sociology	2	3	5	30	30	70	70	200	36	108
				Total	**20**					**800**	**Total contact hours 468**	
2nd Semester	BMLT-201	Pathology I (Haematology I)	4	3	7	30	30	70	70	200	72	108
	BMLT-202	Biochemistry I (Principles of Biochemistry)	4	3	7	30	30	70	70	200	72	108
	BMLT-203	Microbiology I (Bacteriology)	4	2	6	30	30	70	70	200	72	72
				Total	**20**					**600**	**Total contact hours 504**	
3rd Semester	BMLT-301	Pathology II (Haematology-II)	4	3	7	30	30	70	70	200	72	108
	BMLT-302	Biochemistry II (Metabolism)	4	3	7	30	30	70	70	200	72	108
	BMLT-303	Microbiology II (Virology, Molecular Biology)	4	2	6	30	30	70	70	200	72	72
			Total		**20**					**600**	**Total contact hours 504**	
4th Semester	BMLT-401	Pathology III (Blood banking)	4	3	7	30	30	70	70	200	72	108
	BMLT-402	Biochemistry III (Applied Biochemistry I)	4	3	7	30	30	70	70	200	72	108
	BMLT-403	Microbiology III (Immunology)	4	2	6	30	30	70	70	200	72	72
			Total		**20**					**600**	**216**	**288**
											Total contact hours 504	
5th Semester	BMLT-501	Pathology IV (Clinical Pathology)	3	3	6	30	30	70	70	200	54	108
	BMLT-502	Biochemistry IV ((Applied Biochemistry II)	3	3	6	30	30	70	70	200	54	108
	BMLT-503	Microbiology IV (Parasitology)	3	2	5	30	30	70	70	200	54	72
	BMLT-504	Research Methodology	3		3	30		70		100	54	
			Total		**20**					**700**	**216**	**288**
											Total contact hours 504	
6th Semester	BMLT-601	Pathology V (Histopathology & Cytopathology)	2	2	4	30	30	70	70	200	36	72
	BMLT-602	Biochemistry V (Molecular Biology)	2	2	4	20	10	40	30	100	36	72
	BMLT-603	Microbiology V (Mycology, Applied Microbiology, Clinical Microbiology)	2	2	4	30	20	70	70	200	36	72
	BMLT-604	Project Work & Viva	1	4	5	100 (50:50) 50 marks for write up & 50 marks for Viva				100	36	144
	BMLT-605	Optional/choice based Subject	3		3	30		70		100	54	
			Total		**20**					**700**	**198**	**360**
											Total contact hours 558	

THE NAGALAND UNIVERSITYREGULATIONS FOR
B.SC. IN MEDICAL LABORATORY TECHNOLOGY COURSE

Regulations of the University

1. SHORT TITLE AND COMMENCEMENT:
These regulations shall be called "THE REGULATIONS FOR THE B.SC. IN MEDICAL LABORATORY TECHNOLOGY COURSE OF THE NAGALAND UNIVERSITY,"
They shall come into force from the academic year 2016 -2017 onwards.
The regulation and syllabi are subject to modifications by the standing Academic Board from time to time.

2. ELIGIBILITY FOR ADMISSION

(a) Candidates should have successfully completed Higher Secondary (10+2 level) with science subjects

Physics, Chemistry and Biology subjects taken together at the qualifying examination after a period of 12 years of study

(OR)

Physics, Chemistry, Biology and Mathematics subjects taken together at the qualifying examination after a period of 12 years of study

(b) Candidates should have passed the above examination with a minimum of 40% marks in each subject separately including English

(c) A candidate shall, at the time of admission, submit to the Head of the Institution, a certificate of medical fitness from an authorized Medical Officer certifying that the candidate is physically fit to undergo the academic course and does not suffer from any disability or contagious disease.

3. AGE LIMIT FOR ADMISSION:
Applicants should have completed 17 years and be less than 30 years of age as on July 31st.
Those "in Service" would be eligible for a special consideration for relaxation of the age requirement

4. ELIGIBILITY CERTIFICATE:
The candidates who have passed any qualifying examination other than the Higher Secondary course examination conducted by the Government of Nagaland shall obtain an eligibility certificate from the University by remitting the prescribed fees along with the filled in application form, Mark Sheet, Transfer Certificate and other relevant documents required by the University before seeking admission to the affiliated Institution (s).

5. REGISTRATION:
A candidate admitted to the B.Sc.in Medical Laboratory Technology degree course in any one of the affiliated Institution (s) of this University shall register his / her name in the prescribed application form for registration duly filled along with the prescribed fee and a declaration in the format, (as in Annexure) to the Controller of Examination of this University through the affiliated Institution within 60 days from the Cut-off date prescribed for B.Sc. in Medical Laboratory Technology Course for admission.

6. DURATION OF THE COURSE:
3Years (6 semesters) + 1year Internship

7. COMMENCEMENT OF THE COURSE:
The course shall commence ordinarily from 1st October of the academic year.

8. EXAMINATION, EVALUATION AND DECLARATION OF RESULTS
a) **Conduct of Examinations**: University shall conduct **II**, **IV** and **VI** end-semester examinations and the remaining shall be conducted by the respective College (s). For all the end-semester examinations, questions papers shall be prepared by the University.

b) **Examination routine** for end-semester examinations shall be notified by the University which shall be normally of **3**hours duration.

c) **Student Assessment and Progression**: The performance of a student shall be evaluated on a **30: 70**basis *i.e.* **30**marks for internal assessment and **70** marks for end-semester examinations.

d) **Pass Marks:** A student shall have to secure a minimum of **45% *m***arks in the internal assessment (IA), and **45%**marks in the end-semester examinations in theory papers with a minimum of **50%** of the total aggregate (IA + end semester exam). However, in the event of a semester with practical paper, a student shall have to secure a minimum of **55%** marks to be considered passed in a given semester.

e) **Activities for Internal Assessment Tests:**
(i) The internal assessment for **30** marks shall be made in the following categories of activities which will include both theory and practical:
(a) Class Tests/Unit Tests, (b) Assignments, (c) Seminars, (d) Case Studies
(ii) A minimum of two written internal assessment examinations shall be conducted in each subject during a semester and the average marks of two examinations shall be taken into consideration for the award of internal marks.
(iii) A minimum of two practical examinations shall be conducted in each subject (wherever practical have been included in the curriculum) and the average marks of these two examinations shall be taken into consideration for award of internal marks in practical

The internal assessment should necessarily be completed before the conduct of the end-semester examinations.

f) **Eligibility criteria for End-Semester Examinations**: A student shall be deemed qualified to appear at the end-semester examinations only if he/she secures **minimum qualifying marks** in the **Internal Assessment Tests** and maintains **80% attendance separately** in every subject.

g) **Admission to the Next Semester**: Advancement to the next semester shall be permitted only with a maximum of **Two Backlog Papers** from the **preceding semester**. Further, entry to the next semester shall be regulated at the level of **4th, 5th and 6th**semesters as explained under:
(i)Admission to **4th semester** shall be allowed only after clearing **Ist semester backlog paper(s)** during **3rd Semester**.
(ii) Admission to **5th Semester** shall be allowed only after clearing **2nd semester backlog paper(s)** during **4th Semester.**
(iii) Admission to **6th semester** shall be allowed only after clearing **3rd semester backlog paper(s)** during **5th semester**.
(iv)**Backlog paper(s) of 4th semester** needs to be cleared during **6th** Semester.
(v) **Backlog paper(s) of 5th and 6th semesters** need to be cleared during subsequent examinations for these semesters within **10 semesters** with a maximum of only one chance.

9. MEDIUM OF INSTRUCTION:
The medium of instruction and examination shall be in English

10. CURRICULUM:
The Curriculum and the Syllabi for the course shall be as prescribed by the University from time to time.

11. WORKING DAYS IN AN ACADEMIC YEAR:
There will be a total of 90 working days per semester.

12. ATTENDANCE REQUIRED FOR ADMISSION TO EXAMINATIONS:
(a) No candidate shall be permitted to appear for the University examinations, unless he/she attends the course for the prescribed period and produces the necessary certificate of attendance and satisfactory conduct from the Head of the Institution.
(b) Every candidate is required to put in a minimum of 80% of attendance both in theory and practical separately in each subject for admission to the examination.
(c) A candidate having shortage of attendance as prescribed in 12(b) in any subject in theory and /or practical shall not be permitted to appear for the semester examinations.
(d) A concession of 5% in the attendance requirements could be availed by students representing the University in various sports, cultural events. In such instances **official leave** would be granted.
(e)However in the event that a candidate failed in his exams then, the candidate would be on Academic probation and not permitted to participate in various events.

13. CONDONATION OF SHORTAGE OF ATTENDANCE;
For valid reasons, ***5%*** relaxation of the Attendance may be considered by the College Authority.

14. SUBMISSION OF LOG BOOKS:
At the time of practical examination, each candidate shall submit to the examiners his / her
Log books duly certified by the Head of the Department as a bonafide record of the work done by the candidate.
The practical record shall be evaluated by the concerned Head of the Department (Internal Evaluator) and the practical record marks shall be submitted to the University 15 days prior to the commencement of the theory Examinations.
In respect of failed candidates, the marks awarded for record at previous examination will be carried over for the subsequent examination. The candidates shall have the option to improve his performance by submission of fresh records.

15. REVALUATION / RETOTALLING OF ANSWER PAPERS:
(a)There is no provision for revaluation of the answer papers of failed candidates in any examination. However, the failed candidates can apply for retotalling / revaluation.
(b) The Academic Committee will form a moderation committee of 3 members each year. Moderation marks cannot exceed 5 for any one candidate for all papers combined. This can be given to those papers where the candidate has borderline marks by the moderation committee.
(c) If after moderation a candidate gets less than 40 % there is no re-evaluation. Revaluation of papers between the 40%-50% would be done by two separate examiners. If the pass percentage of 50% was not achieved even after these evaluations, the candidate would be deemed to have failed the exam.

16. RE-ADMISSION AFTER BREAK OF STUDY:
(a)In the event of a break in studies exceeding 6 months, a special condonation letter should be availed from the University.
(b)The candidate have to complete the course within 4 years of date of admission or within double the course period.

17. VACATION: 2 weeks in each semester

18. PATTERN OF QUESTION PAPER FOR UNIVERSITY EXAMINATION:
Descriptive type Questions = 30%

Descriptive Short Notes =30%
Short Answer questions =20%
MCQ Type =20%

DETAIL SYLLABUS FOR
B.Sc. IN MEDICAL LABORATORY TECHNOLOGY COURSE

SEMESTER I : 20 CREDITS

Fundamentals of Pre & Para Clinical Subjects:

Subject Description:

This course is designed to provide Allied Health Professionals a basic knowledge of Human Anatomy and Physiology, Biochemistry, Pharmacology, Clinical and General Pathology, Microbiology, biostatistics, sociology, computer science and medical ethics

BMLT 101: BASIC SCIENCES I

Anatomy and Physiology

INTRODUCTION TO THE CHEMISTRY OF LIFE:
- Atoms, molecules and compounds.
- Important biological molecules.
- Movements of substances within body fluids.
- Body fluids.

THE CELLS, TISSUES AND ORGANISATION OF THE BODY:
- The cell: structure and functions
- Tissues
- Organisation of the body
- The Skeleton
- Cavities of the body

THE BLOOD
- Blood cell formation and functions.
- Red blood cells.
- Blood grouping

THE CARDIOVASCULAR SYSTEM
- Heart – Position, Structure, Flow of blood through the heart
- Blood Pressure.
- Pulse.
- Circulation of blood
- Pulmonary Circulation
- Systemic or general circulation.

THE LYMPHATIC SYSTEM
- Lymph and Lymph vessels
- Lymphatic organs and Tissues

THE NERVOUS SYSTEM
- Central nervous system
- The meaning and cerebrospinal fluid (CSF)
- Brain
- Spinal Cord
- Peripheral nervous system.

THE SPECIAL SENSE

- Hearing and the ear
- Balance and the ear
- Sight and the eye
- Sense of smell
- Sense of taste

THE ENDOCRINE SYSTEM

- Pituitary gland and hypothalamus
- Thyroid gland
- Parathyroid glands
- Adrenal glands
- Pancreatic islets
- Pineal gland
- Thymus gland
- Local hormones

THE RESPIRATORY SYSTEM

- Nose and Nasal cavity
- Pharynx
- Larynx
- Trachea
- Lungs
- Bronchi and bronchioles
- Respiratory bronchioles and alveoli
- Respiration

INTRODUCTION TO NUTRITION

- The balanced diet
- Carbohydrates
- Proteins (nitrogenous foods)
- Fats
- Vitamins
- Minerals, trace elements and water
- Non- starch polysaccharide (NSP)

THE DIGESTIVE SYSTEM

- Organs of the digestive system
- Basic structure of the alimentary canal
- Mouth
- Salivary glands
- Pharynx
- Oesophagus
- Stomach
- Small intestine
- Large intestine, Rectum and Anal canal
- Pancreas
- Liver

THE URINARY SYSTEM

- Kidneys
- Ureters
- Urinary bladder
- Urethra
- Micturition

THE SKIN

- The Skin - Structure of the skin, Function of the skin, Wound healing.

RESISTANCE AND IMMUNITY

- Non-specific defense mechanism
- Immunity

THE MUSCULOSKELETAL SYSTEM

- Bone
- Axial skeleton
- Appendicular skeleton
- Joints
- Main synovial joints of the limbs
- Muscle tissue
- Principal skeletal muscle

INTRODUCTION TO GENETICS

- Chromosomes, genes and DNA
- Protein synthesis
- Cell division
- The genetic basis of inheritance

THE REPRODUCTIVE SYSTEMS

- Female reproductive system
- External genitalia (vulva)
- Internal genitalia
- Breasts
- The male reproductive system.

Suggested reading: Text Book of Medical Physiology" by **Guyton and Hall, 13th edition (Publisher, Elsevier)**

BMLT 102: BASIC SCIENCES II

a) Biochemistry:

Basics of carbohydrates, Amino acids, Protein and Non-protein, Lipids, Enzymes, Minerals- Iron, Calcium & Magnesium, Normal value ranges

b) Pharmacology:

General definitions- Pharmacology, Drugs, Medical pharmacology, Toxicology, Pharmacodynamic properties, Pharmacokinetic properties

- Introduction to pharmacology, Basic pharmacology terminology and concepts
- Introduction to pharmacodynamics
- Introduction to pharmacokinetics- absorption, distribution, elimination
- Mechanism of drug action, dosage forms, routes of administration
- Common generic and trade names
- Medication errors, Legal aspects in pharmacology

c) Basic Pathology

Introduction of Pathology- Branches of Pathology

Basic of inflammation, infection, degeneration and tumors (Neoplasm)

Basic Haematology – Blood collection & Different anticoagulant use. Blood Composition, Functions, Normal Ranges & Disorders

Clinical pathology- Study of body Fluids- Urine, stool & CSF and their variations in common diseases.

d) Microbiology

Introduction and historical background of Microbiology, classification special characteristics of organisms, cultivation (Different types of Media) and identification of organisms Sterilization techniques; Basics of Immunology- Ag Ab reaction & Basics in Immune response & Hypersensitivity, Parasites and Fungi

References:

1. Textbook of Biochemistry for Medical Students 6th Edition, DM Vasudevan , Sreekumari S , KannanVaidyanathan.
2. Textbook of Microbiology 9th Edition, Ananthanarayan , Paniker**.**
3. Text book of pathology & Genetics by purnima S.Rao.
4. Handbook on Medical Laboratory Technology Praful B Godkar

BMLT103: ENGLISH INCLUDING TERMINOLOGY/ ETHICS/COMPUTER

a) English Communication Skill

Course Objective

To develop the potential for language use to perform communicative functions, meeting the demands in the student's academic and professional set-ups

The subject covers the aspects of oral communication, Grammar, Reading and Writing.

Subject description:

Phonetics/ Vocabulary& Reading:

Oral Work:/ Grammar / Reading/ Writing:

Reference: Manipal Academy of higher education; English book for Nurse by Selva Rose, 3rd Edition.

b) Medical Terminology- (Including fundamentals of clinical science)

Subject Description: Orientation to medical terminology, terms related to sympathetology, causation investigations and treatment of condition within medicine, surgery, Obstetrics and Gynecology, all specialties including terms related to biological disorders (skin and breast, Musculo-skeletal, Neurological and Psychiatric, Cerebro& Cardiovascular disorders, and Common diseases affecting each of the above system).

Reference: Hand book of Medical Terminology- IR Asher
Medical diagnostic & procedural Terminology- Asher
Medical Dictionary-Oxford &IBH

c) Medical Ethics

a. Medical ethics - Definition - Goal - Scope
b. Code of conduct - Introduction
c. Basic principles of medical ethics – Confidentiality
d. Malpractice and negligence - Rational and irrational drug therapy
e. Autonomy and informed consent - Right of patients
f. Care of the terminally ill- Euthanasia
g. Organ transplantation
h. Medico legal aspects of medical records – Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication – Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects

Reference: Principles of Bio-Ethics: Tom Beauchamp & Childress.

d) Basics of Computers

Course Content:
Introduction to computer – I/O devices – memories – RAM and ROM – Different kinds of ROM
Networking – LAN, WAN, MAN (only basic ideas)
MS word, MS-Excel, MS-POWERPOINT,
Explorer and Navigator – Uploading and Download of files and images – E-mail ID creation –Sending messages – Attaching files in E-mail – Introduction to "C" language –

Practical
Creating a worksheet using MS-Excel with data and sue of functions
Using MS-Excel prepare a worksheet with text, date time and data
Preparing a chart and pie diagrams using MS-Excel
Using Internet for searching, uploading files, downloading files creating e-mail ID
Using C language writing programs using functions
Computer application of statistical data

Reference: 1. Computer Fundamentals: Pearl Software
2. Fundamentals of Computers: E. Balagurusamy

BMLT104: BIOSTATISTICS/SOCIOLOGY

a) Biostatistics

General Statistics

- Definition and importance of biostatistics
- Types of data, rates and ratio
- Methods of collection of data-primary and secondary data
- Sampling of data
- Measures of central tendency (Mean, median, mode)
- Measures of Dispersion (Mean deviation, standard deviation, Range)
- Presentation of data (Bar diagram, Pie diagram, Histogram, Frequency, Polygon, Frequency curve, Cumulative frequency curve, Line diagram)
- Correlation and Regression analysis
- Basic concept of probability

Reference : Introduction to Biostatistics and Research Methods (5th Edition)– P.S.S. SundarRao& J. Richard.

b) Sociology and Environment Health: Practical including field work

Sociology and health

- Difference between community health and clinical medicine
- Concepts in sociology which influence health and disease.
- Social structure, social behaviour, social institutions, socialization, culture, custom, acculturation. standard of living, social problems, social stress and social surveys
- Types of family, functions of family, family and health, broken family.
- Demography and health.
- Influence of social factors on health.

References – Text book of preventive Medicine by Park and Park Chapters 12 and 13.

Environment health: The influence of environment on health and preventive measures.

- Water, air, soil, housing, waste, radiation
- Water - Sources of water, quality of water, water pollution, purification of water, disinfection.
- Air –air pollutants, sources of air pollution, effects of air pollution.
- Housing – types and influence on health
- Waste disposal - excreta disposal, hospital waste disposal impact on health
- Radiation exposure and effect on health

References – Text book of preventive Medicine by Park and Park Chapters 12 and 13.

SEMESTER II: 20 CREDITS

BMLT 201: PATHOLOGY I (Haematology I)

Theory

Introduction to Haematology

- Haemopoiesis.
- Normal constituents of blood, Their structure and function.
- Collection of Blood samples, processing and preservation
- Various Anticoagulants used in Haematology
- Various instruments and glassware used in Haematology,

Preparation and use of glassware

- Preparation and staining of blood films
- Normal Haemoglobin& abnormal haemoglobin
- Blood cell counts (RBC, WBC etc)

Estimation of

-haemoglobin

- PCV/Haematocrit
- Red cell indices
- ESR

Examination of blood films and differential counts

Haematological disorders-

* ANAEMIAS-

Introduction, Definition, Classification, Clinical features, Laboratory diagnosis, differential diagnosis.

- Definition, classification, causes
  -Microcytic hypochromic – Pathophysiology, causes and lab. Features
  - Normocytic Normochromic anaemia: Pathophysiology, causes and lab. Features -
  Macrocytic anaemia: Pathophysiology, causes and lab. Features
- Hemolytic anaemia: definition, classification and lab features.

Special haematological Techniques

- Bone marrow examination.
- Preparation of smears and staining
- Reticulocytes count
- AEC
- Sickling tests
- Osmotic fragility test
- DeterminationHbFandHbA2
- Hb electrophoresis & Hb HPLC

- Demonstration of LEcells

Practical-

- Preparation and staining of blood films and peripheral blood picture
- Blood cell counts (RBC, WBC etc)
- Estimation of
  - -Haemoglobin
  - - PCV/ Heamatocrit
  - - Red cell indices
  - - ESR

Examination of blood films and differential counts
Reticulocyte count
AEC
Sickling tests

Case study

BMLT 201: BIOCHEMISTRY I (Principles of Biochemistry)

Theory

Introduction and scope of Biochemistry
Cell structure and functions

Carbohydrates
Chemistry of Carbohydrates, Classification,Physical and chemical properties and the biologic importance of carbohydrates.

Amino acids &Proteins
Biological importance of Amino acids and proteins, hydrolytic products of protein, classificationof amino acids, classification of proteins and lipoproteins.

Lipids
Definition of oils and Fats, Fattyacids, Classification of lipid, properties and biological functions; Biologicalimportance of phospholipids and steroids

Nucleoproteins
Nucleicacids DNA & RNA, Nucleotides, Nucleosides and structure of nucleic acids, biologically important nucleotides.

Basic Chemistry

Laboratory glassware and its uses.
Analytical balance,
Basics of colorimeter, Spectrophotometer,pH meter,Flame photometer
Solution preparation
Molecular weight, equivalent weight of elements and compounds, normality molarity
Preparation of molar solutions(mole/litresolution)eg:1MNacl,0.15MNaCL 1MNaOH,0.1MHCl,0.1MH_2S0_4etc.,

Preparation of normal solutions.eg.,IN Na_2CO_3,OINOxalicacid,0.1NHCl,0.1N H2504,0.66NH_2S0_4etc.,
Percent solutions.Preparation of different solutions–v/vw/v(solids,liquidsandacids)
Conversion of a percent solution into a molar solution

Dilution

Diluting solutions: e.g. Preparation of 0.1N NaClfrom 1 N NaClfrom 2 N HCletc., Preparing working standard from stock standard, Body fluid dilutions,Reagent dilution techniques, calculating the dilution of a solution, body fluid reagent etc.,
Saturated and super saturated solutions.Standard solutions.Technique for preparation of standard solutions eg:Glucose, ureaetc. Significance of volumetric flask in preparing standard solutions. Volumetric flasks of different sizes, Preparation of standard solutions of deliquescent compounds ($CaCl_2$, potassium carbonate, sodium hydroxide etc.,)
Preparation of standards using conventional and SI units.

Practical – qualitative test for

- Carbohydrates
- Protein

-quantitative estimation of

- Carbohydrates by Folin-wu method, hexokinase method and gluco-oxidase method

CASE STUDY

BMLT 203: MICROBIOLOGY I (BACTERIOLOGY)

Theory General Bacteriology

Introduction and brief history of Microbiology

Sterilization and Disinfection, Principles and use of equipment of sterilization, namely Hot Air oven, Autoclave and serum Inspissation, Pasteurization, antiseptic and disinfectants
Antimicrobial sensitivity test, Handling of waste, waste segregation and management including disposal.
Concept of universal precautions, biohazard

Systematic Bacteriology

Morphology, Cultivation, Classification, antigenic structure, pathogenicity, laboratory diagnosis including specimen collection of the following bacteria:
Staphylococci, Streptococci, Pneumococci, Gonococci, Menigococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Escherichia coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochetes.

Common staining and special staining in microbiology

Antimicrobial Agents

Normal flora of the human body

Practical-Isolation and identification of bacteria

- Biochemical tests (Indole, MR, VP, Citrate, TSI, Oxidase, Coagulase, catalase)
- Hanging drop method for motility
- Anaerobic culture methods of bacteria
- Identification of Organism- MMTPC,
- Staining techniques
- Culture and sensitivity

CASE STUDY

References

BIOCHEMISTRY I

1. Textbook of Biochemistry For Medical Students 6th Edition, 6th Edition, DM Vasudevan , Sreekumari S , KannanVaidyanathan
2. Biochemistry, 4th Edition, U. Satyanarayana , U. Chakrapani
3. Lippincott's Illustrated Reviews Biochemistry: Biochemistry, 5th Edition (REFERENCE)
4. Tietz,Norbeer. Fundamentals of Clinical Chemistry
5. Understanding Laboratory Tests: A Quick Reference, 1st Edition

MICROBIOLOGY I

1. Textbook of Microbiology 11th Edition, Ananthanarayan, Paniker
2. Textbook of Microbiology 6th Edition, C. P. Baveja
3. Mackie and McCartney Practical Medical Microbiology 14th Edition (REFERENCE)
4. Basic Immunology: Functions and Disorders of the Immune System by Abbas

HEMATOLOGY (Pathology I)

1. Dacie and Lewis Practical Haematology, International Edition: Expert Consult Online and Print, 11th Edition (REFERENCE)
2. Clinical pathology, haematology and blood banking 2/e edition by Maheshwari
3. Color Atlas of Clinical Hematology 2nd Edition by A Victor Hoffbrand& John E Pettit
4. Text book of Hematology by ShirishKwathalkar
5. Wintrobe, Clinical Haematology (International Edition)
6. DeGruchy, Clinical Haematology in Medical Practice, Blackwell

CENTRAL LAB REFERENCES

1. Textbook of Medical Laboratory Technology : Clinical Laboratory Science and Molecular Diagnosis 3rd Edition by Praful B. Godkar , Darshan P. Godka
2. Park Textbook of Preventive and Social Medicine 23rd edition (park psm)
3. Laboratory bio safety manual by WHO 3rd Edition
4. Mukherjee, kanai, L. Medical Laboratory Technology (vol I II & III). Tata McCraw- Hill, New Delhi.
5. Talib. VK, Handbook of Medical Laboratory Technology Sponsored by WHO.

SEMESTER III : 20 CREDITS

BMLT 301: PATHOLOGY II (Haematology II)

Non-neoplastic leucocytes disorder

A-leukemic leukemia, Leukemoid reaction, reactive leukocytosis

Leukemia& Chronic myeloproliferative diseases

Introduction, Definition,classification, clinical features, laboratory diagnoss, differential diagnosis. Bone marrow examination in leukemia.

Lymphoma

Plasma cell disorder- basic introduction

Coagulation disorders

Normal haemostasis- coagulation cascade, coagulation factors.
Platelets – Normal, Quantitative & qualitative disorders
Coagulation disorders – Definition, classification, clinical indication, laboratory diagnosis.
Special tests-
Bleeding time, Clotting time
Clot retraction time

- PT
- APTT
- Thrombin time (TT)
- D-DIMER
- Mixing studies
- Factors assay
- APLA (antiphospholipid antibody- LA & ACL)

Practical

1. Bleeding time, Clotting time , Clot retraction time, PT INR,APTT, TT, Mixing studies
2. Investigation of leukemia, lymphoma, plasma cell disorders
   BM examination- special staining – PAS,MPO,SBB,NSE,IRON (pearl's)
   STAINING, MGG, NAP /LAP score

Case study

BMLT 302: BIOCHEMISTRY II (Metabolism)

Theory: Metabolism

1. Carbohydrates, Digestion&absorption,metabolism of glucose, glycolysis, glycogen formation& breakdown, glycogen storage disease, maintenance of blood sugar levels,hormonal influence, diabetes melitus,Interconversionof monosaccharides.
2. Digestion of proteins, urea synthesis, Creatinine synthesis & degradation, Transamination, metabolism of amino acids
3. Lipids digestion & absorption of lipids, synthesis of fatty acids, oxidation of fatty acids, cholesterol synthesis.
4. Purines and pyrimidine metabolism.
5. Hormones:

Role of biologically important hormones.Pituitary hormones, Thyroid, Adrenal cortex and medulla and Sex hormones.Mechanism of control diseases and biochemical tests for under and overproduction.

6. Haemoglobin and porphyrias: Structure of haem,biosynthesis, porphyrias catabolism of haem,hemoglobin quaternary structure. Structure of myoglobin,transport of gases,oxygen dissociation of curves, Isohydric transport of CO2 fetal Hb,carboxyhaemoglobin, methaemoglobin.
7.Formation and composition of cerebrospinal fluid in disease.

Practical: Colour reaction of Amino Acids
Identification of unknown substances (Amino acids)

- Qualitative tests for Proteins
- Qualitative tests for Bencejonce's protein
- Serum protein estimation

- Total protein (Biuret method)
- Albumin (BCG dye binding method)

CASE STUDY

BMLT 303: MICROBIOLOGY II (Virology, Molecular Biology)

Virology

General properties of virus, cultivation of viruses, Pox viruses, Herpes viruses, Adenoviruses, Picornaviruses, Orthomyxovirus, Paramyxoviruses, Arboviruses, Rhabdoviruses, Hepatitis viruses, Oncogenic viruses, HIV, Parvovirus, Viral haemorrhagic fevers, SARS, Rotavirus, Norwalk virus, Coronavirus.

Molecular techniques

Application of genetic engineering in medical field

Introduction to molecular biology, Nucleic acid – DNA and RNA

- Isolation of DNA (genomic and plasmid)
- Plasmids (types and importance)
- PCR

Practical: Rapid serological test & ELISA for HBsAg, HIV, HCV etc.
Examination of tissue culture
Demonstration of western blot

Case study

References

BIOCHEMISTRY

1. Textbook of Biochemistry For Medical Students 6th Edition, 6th Edition, DM Vasudevan , Sreekumari S , KannanVaidyanathan
2. Biochemistry, 4th Edition, U. Satyanarayana , U. Chakrapani
3. Lippincott's Illustrated Reviews Biochemistry: Biochemistry, 5th Edition (REFERENCE)
4. Tietz,Norbeer. Fundamentals of Clinical Chemistry.
5. Understanding LaboratoryTests : A Quick Reference, 1st Edition

MICROBIOLOGY

1. Textbook of Microbiology 9th Edition, Ananthanarayan , Paniker
2. Textbook of Microbiology 4th Edition, C. P. Baveja
3. Mackie and Mccartney Practical Medical Microbiology 14th Edition (REFERENCE)
4. Bailey & Scott's Diagnostic Microbiology 14th Edition
5. Basic Immunology: Functions and Disorders of the Immune System by Abbas

HEMATOLOGY (Pathology II)

1. Dacie and Lewis Practical Haematology, International Edition : Expert Consult Online and Print, 11th Edition (REFERENCE)
2. Clinical pathology, haematology and blood banking 2/e edition by Maheshwari
3. Color Atlas of Clinical Hematology 2nd Edition by A Victor Hoffbrand& John E Pettit
4. Text book of Hematology by ShirishKwathalkar
5. Wintrobe, Clinical Haematology (International Edition)
6. DeGruchy, Clinical Haematology in Medical Practice, Blackwell

CENTRAL LAB REFERENCES

1. Textbook of Medical Laboratory Technology : Clinical Laboratory Science and Molecular Diagnosis 3rd Edition by Praful B. Godkar , Darshan P. Godka
2. Park Textbook of Preventive and Social Medicine 23rd edition (park psm)
3. Laboratory bio safety manual by WHO 3rd Edition
4. Mukherjee, kanai, L. Medical Laboratory Technology (vol I II & III). Tata McCraw- Hill, New Delhi.
5. Talib. VK, Handbook of Medical Laboratory Technology Sponsored by WHO.

SEMESTER IV : 20 CREDITS

BMLT 401:PATHOLOGY III (Blood Banking)

Blood Banking (Immunohematology)

1. ABO Blood group and Rh system
2. Subgroups of A and B, Other blood groups and Bombay group
3. HLA antigens and their significance
4. Principles of Blood transfusion:

(a)Blood donor selection
(b)Methods of bleeding donors
(c)Blood containers,anticoagulants and storage of blood
(d)Coomb's test and its significance
(e)Screening of blood for transfusion transmitted infection
(f) Blood components,preparation&componenttherapy
(g)Autologous transfusion
(h)Transfusion reactions and workup
(i) Blood bank organization,standards,procedures, techniques and quality control

Quality controls

Internal quality control & External quality control Schemes.

Practical:

(a)Blood donor selection
(b)Methods of bleeding donors
(c)Blood containers, anticoagulants and storage of blood
(d)Coomb's test and its significance
(e)Screening of blood for transfusion transmitted infection
(f) Blood components, preparation
(g)Transfusion reactions and workup

ABO Blood group and Rh system

Coomb's test- Direct & indirect.
Cross matching

Case study

BMLT 402:BIOCHEMISTRY III (Applied Biochemistry I)

Organs function tests, In-born error in metabolism
Acid-base balance, minerals, Vitamins.
Organ Function Tests

- Liver function tests
- Kidney function tests
- Thyroid function tests

- Gastric function tests
- Cardiac function test

Inborn- error in metabolisms
Acid-base balance & Electrolytes

Mineral – biological roles, deficiency states of calcium, phosphorous, iron, iodine, fluoride, cobalt and zinc

Vitamins- Classification, general characteristics
Biological roles and deficiency states

Enzymes kinetics

- Enzymes – definition
- Classification of enzymes
- Nature of enzymes
- Clinical application of enzymes
- Mechanism of enzyme action
- Factors affecting enzyme activity, enzyme inhibition, regulation of enzyme activity
- Coenzyme, definition, function and importance

Practical
Estimation of

- Estimation of blood urea, creatinine, uric acid
- Serum bilirubin total, conjugated and unconjugated
- Estimation of Na, K
- Estimation of Ca, P, Cl
- Thyroid function test
- Estimation of clinically important enzymes: amylase, ALP, ALT,AST, CPK, GGT, LDH

BMLT 403: MICROBIOLOGY III (Immunology)

Immunology

1. Infection
2. Immunity
   A. Innate immunity
   B. Acquired immunity (adaptive immunity)
3. Immune System
   Cell development, B Lymphocytes (general knowledge of their role), Bursa of Fabricius, Stem cell differentiation, Gut-associated lymphoid tissue(GALT), T Lymphocytes, Stem cell differentiation (General knowledge of their role), Cytotoxic T(Tc) cells, Helper T (TH) cells, Suppressor T(TS) cells, Natural killer cells.

4. Dual nature of the Immune system
   i. Humoral immunity
   ii. Cell mediated immunity

General properties of Immune system in detail.
General characteristics
- Antigen types

- Antigen sensitization
- Plasma cells
- Antigen & Antibody reaction in details
- Amnestic reaction

- Properties of Antibodies (immunoglobulins)
  Light chains, Heavy chains, Constant and variable regions, Antigen binding sites, Fab and Fc regions, Antibody titer
- Classes of Immunoglobulins
  IgG, IgM, IgA, IgE, IgD
- Primary and secondary responses
  1. Primary response 2. Secondary response
- Types of antigen- antibody responses, how Humoral responses eliminate foreign antigens
- Basics mechanisms
  a. Agglutination
  b. Opsonization
  c. Activation of complement
  d. Neutralization
- Hypersensitivity reactions
- Autoimmune disorders

Practical

1) Serological tests in bacterial and viral disease diagnosis: VDRL, WIDAL, RA test, ASO test, pregnancy test, HBsAg, HCV Test, HIV test
2) Skin hypersensitivity test (Mantoux test)

CASE STUDY

References

BIOCHEMISTRY III

1.Textbook of Biochemistry For Medical Students 6th Edition, 6th Edition, DM Vasudevan , Sreekumari S , KannanVaidyanathan
2. Biochemistry, 4th Edition, U. Satyanarayana , U. Chakrapani
3. Lippincott's Illustrated Reviews Biochemistry : Biochemistry, 5th Edition (REFERENCE)
4. Tietz,Norbeer. Fundamentals of Clinical Chemistry.
5. Understanding Laboratory Tests : A Quick Reference, 1st Edition

PATHOLOGY III (Blood banking)

1. Clinical pathology, haematology and blood banking 2/e edition by Maheshwari
2. Blood banking Guidelines By NBTC
3. Blood Banking Guidelines by WHO

MICROBIOLOGY III

1. Textbook of Microbiology 9th Edition, Ananthanarayan , Paniker
2. Textbook of Microbiology 4th Edition, C. P. Baveja
3. Mackie and Mccartney Practical Medical Microbiology 14th Edition (REFERENCE)
4. Basic Immunology: Functions and Disorders of the Immune System by Abbas
5. Roitt's Essential Immunology 13th edition

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1. Textbook of Medical Laboratory Technology : Clinical Laboratory Science and Molecular Diagnosis 3rd Edition by Praful B. Godkar , Darshan P. Godka
2. Park Textbook of Preventive and Social Medicine 23rd edition (park psm)
3. Laboratory bio safety manual by WHO 3rd Edition
4. Mukherjee, kanai, L. Medical Laboratory Technology (vol I II & III). Tata McCraw- Hill, New Delhi.
5. Talib. VK, Handbook of Medical Laboratory Technology Sponsored by WHO

SEMESTER V: 20 CREDITS

BMLT 501: PATHOLOGY IV (Clinical Pathology)

Theory: Clinical Pathology

1. Urine analysis-

- Collection
- Composition, importance of examination
- Routine examination (macro, micro, physical, chemical)
- Urine preservation
- Quantitative and qualitative test for proteins, albumin
- Test for reducing substances
- Test for acetone bodies in urine
- Strip technology
- Evaluation of renal function test
- Occult blood test
- Change of urine in various diseases
- Hematuria, proteinuria, chyluria, ketonuria types, causes and detection in urine

2. Stool examination-

- Collection
- Composition, importance of examination
- Routine examination (macro, micro, physical, chemical)
- Concentration technique, Occult blood test
- Examination for intestinal parasites

3. Body fluids examination- transudate and exudates

a) Ascitic fluid
b) Pleural fluid
c) Pericardial fluid
d) Synovial fluid
e) Amniotic fluid
f) CSF
g) Gastric Fluid
h) Infertility – Male & Female (Pregnancy test)
i) Sperms/Semen
   - Formation, composition, routine examination
   - Special examination
   - Normal values
   - Abnormalities and its clinical significance

Practical -

1. Urine analysis- physical, chemical and microscopy
2. Stool examination- Physical, Chemical and microscopy
3. Body fluids examination

- Study of abnormal urine constituents (glucose, protein, ketone bodies, blood, bile salts and bile pigments)

CASE STUDY

BMLT 502:BIOCHEMISTRY IV (Applied Biochemistry II)

Theory:Radio-isotopes, special techniques

Radio- isotopes- clinical important, uses in clinical diagnostics
Theory of competitive immunoassay, immunometric assay &immune turbidometry
Spectrophotometry, Flame- photometer, Colorimetry, Chromatography,Electrophoresis
Nephelometry, Flurometry

Practical

Spectrophotometry
Flame- photometer
Colorimetry
Spectrophotometry,
Chromatography
Electrophoresis

BMLT 503: MICROBIOLOGY IV (Parasitology)

Parasitology

Introduction

Protozoology-

Entamoeba histolytica, Balantidium coli, Giardia, Toxoplasma, Malaria, Leishmania etc.

Helminthology

Cestodes- Taenia, Echinococcus, D. latum, H. nana
Trematodes- Schistosoma, Fasciola etc.
Nematodes- Ascaris, Hookworm, Strongyloides, Trichuris, Trichinella,
Dracunculus, Filarial worms etc.

Practical

Identification of Haemoflagellate – Leishman stain
Identification of intestinal parasites
Stool examination- Wet Mount Iodine & Saline
Stool concentration technique- Floatation technique (zinc sulfate), Sedimentation technique (ether concentration) etc.

Case study

BMLT 505: RESEARCH METHODOLOGY

I. Overview of research process
II. Research problem
III. Hypothesis & Assumption

IV. Literature review
V. Research Approaches & Designs
VI. Population Samples, Sampling
VII. Tool & Methods of Data Collection
VIII. Analysis of Data
IX. Communication Format of Thesis

References

BIOCHEMISTRY IV

1. Textbook of Biochemistry For Medical Students 6th Edition, 6th Edition, DM Vasudevan , Sreekumari S , KannanVaidyanathan
2. Biochemistry, 4th Edition, U. Satyanarayana , U. Chakrapani
3. Lippincott's Illustrated Reviews Biochemistry : Biochemistry, 5th Edition (REFERENCE)
4. Tietz,Norbeer. Fundamentals of Clinical Chemistry.
5. Understanding LaboratoryTests : A Quick Reference, 1st Edition

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1. Textbook of Microbiology 9th Edition, Ananthanarayan , Paniker
2. Textbook of Microbiology 4th Edition, C. P. Baveja
3. Mackie and Mccartney Practical Medical Microbiology 14th Edition (REFERENCE)
4. Parasitology Protozoology & Helminthology 13th Edition
5. Medical Parasitology-3rd Edition by Rajesh KaryakarteAjitDamle
6. BasicImmunology:Functions and Disorders of the Immune System by Abbas

RESEARCH METHODOLOGY

1. Research Methodology and Statistical Techniques by S. Gupta

2. Nursing Research and StatisticsPaperback– 1 Jan 2010 bySuresh K. Sharma(Author)

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1. Textbook of Medical Laboratory Technology : Clinical Laboratory Science and Molecular Diagnosis 3rd Edition by Praful B. Godkar , Darshan P. Godka
2. Park Textbook of Preventive and Social Medicine 23rd edition (park psm)
3. Laboratory bio safety manual by WHO 3rd Edition
4. Mukherjee, kanai, L. Medical Laboratory Technology (vol I II & III). Tata McCraw- Hill, New Delhi.
5. Talib. VK, Handbook of Medical Laboratory Technology Sponsored by WHO.

SEMESTER VI : 20 CREDITS

BMLT 601: PATHOLOGY V (Histopathology & Cytopathology)

Theory: Histopathology- Diseases, cytology and Cytogenetics

Histology – Study of Diseases –

1. Alimentary System Disease of Mouth,Esophagus- Esophageal varices.
2. Digestive Sysytem Gastritis, peptic ulceration, appendicitis, microbial diseases, food posisoning, hernia, intestinal obstruction & malabsorption.
3. Accessory Digestive glands : Salivary glands –mumps. Liver – hepatitis,Liver failure, Cirrhosis. Pancreatitis, Gall bladder- Gall stones, jaundice. Cardiovascular.
4. Circulatory System Diseases of Blood Vessels – Heart block, Arteriosclerosis, Disorders of Blood Pressure.
5. Respiratory System- Upper respiratory Tract infection, bronchi, Asthma,Pneumonia, Lung Abscess, tuberculosis,Lung Collapse.
6. Urinary tract System- Glomerulonephritis, Nephrotic Syndrome, renal failure, renal calculi, urinary obstruction, UTI.
7. Reproductive System – STD, Pelvic inflammation disease, disorders of 8. cervix, Ectopic pregnancy, prostitis, infertility.
8. Nervous system. Neuronal damage, ICP, Cerebral Infarction, Head injury, Alzheimer's , Dementia.
9. Endocrine System : Pituitary –Hyper & hypo Secretions

   Thyroid: Goiter
   Adrenal: Cushing Syndrome, Addison disease
   Pancreas: Diabetes

10. Sense organs: Ear – Otitis , Eye : Cataract.

Histopathology

Introduction tohistopathological techniques
Reception of specimens,Fixation-formalinfixation,TissueprocessingandEmbedding,Sectioncutting,Mountingandstaining.
Theory of H&E staining
Theory of fixing,processing&cutting of tissuesSectioncutting
Use& careofMicrotome
PASstaining,Reticulin,pearlstain,Immunohistochemistry
Museumtechniques
Preparation of mounting medium& mounting of specimen
Frozen section

Cytology

Theory

PrinciplesofExfoliativecytology/ Fine needle aspersion cytology (FNAC)
Fixationofsmears
Papstaining& Identificationofcellsinanormalvaginalsmear
Preparation of smear for fineneedle aspiration cytology
PAPstaining,principles&uses
AFBstaining(TBandLeprosy)
Frozensection&careofcryostat Papstaining
MGGstaining forFNAC

Cytogenetics

Basic of human Genes, human chromosomes, Chromosomal abnormalities, Chromosomal analysis (karyotyping), Immuno Histology- Introduction to flow cytometry and its application in Haeamatology

Practical

Mountingandstaining
H&Estaining.
PAS staining,
PAP staining
Pearls (iron) staining.
Tissue cutting (microtome)

Case study

BMLT 602: BIOCHEMISTRY V (Molecular Biology & Automation)

Nucleic acid replications (DNA & RNA) , Automation in Biochemistry with LIS (Laboratory information system) and Quality control
DNA structure,replication,transcription&proteinbiosynthesis.
StructureofDNA, nucleoproteins,introns,exons. Replication, DNA polymers,cell cycle, repair enzymes,linear damage&repair,restrictionendonucleases,messengerRNAtranscription, elongation, termination,post transcriptional processing,transferRNA, protein synthesis, geneticcode,translation,initiation,elongation,termination,posttranslationalprocessing, inhibitors of protein synthesis,mitochondrial DNA& RNA,Operon hypothesis
DiagnosticusefulnessofrecombinantDNAtechnology.
Defectsarisingfromgeneticmutationsinfamilialhypercholesterolemia,cycticfibrosis,aminoacid disorders,organic acidurias &Galactosemia&fructose intolerance.
Biochemistryofcancer:
Etiologyofcancer,mutagens,carcinogens,selectedtumormarkers,alphafetoprotein, CEA,PSA,beta-HCG,VMA,tumormarkersinmyeloma,Bencejonesproteins,beta-2-microglobulin.

Automation in Biochemistry laboratory with LIS.

Quality Controls
IQA, EQA. Quality control management scheme.Levy's jenning chart, Precisions, accuracy, Bias, mean, Variance, Standard deviation.

Practical
Estimation of Tumor markers
Preparation of LJ charts
Interpretation of westguard rules
Calculation of Mean, SD, CV, VIS, BIAS etc
Preparation of quality control samples

Case study

BMLT 603: MICROBIOLOGY V (Mycology, Applied Microbiology, Clinical Microbiology)

Mycology
a. Superficial Mycoses- Malsezzia furfur, *T. nigra, T. piedra*
b. Subcutaneous Mycoses i. Mycetoma
ii. Rhinosporidium
iii. Sporotrichosis
c. Dermatophytes

d. Systemic Mycoses
i. Histoplasmosis

ii. Blastomycosis
iii. Coccidioidomycosis
iv. Paracoccidioidomycosis

e. Opportunistic Fungi
i. Aspergillosis
ii. Penicillosis
iii. Zygomycosis
iv. Pneumocystis
v. Mycotoxins

Applied Microbiology
- Bacteriology of water, air, milk and food, milk and food
- Immunoprophylaxis
- Healthcare Associated Infections
- Biomedical waste management

Clinical Microbiology
- Systemic infections- PUO, CVS and BSI, GI, Soft tissue, CNS, Respiratory tract, Urinary tract, Sexually Transmitted etc.

Practical

Identification of – yeast & fungi, LPCB mount, Germ tube test
Bacteriology of Water, Food, Milk and Air

Case study

References

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1. Textbook of Biochemistry For Medical Students 6th Edition, 6th Edition, DM Vasudevan , Sreekumari S , KannanVaidyanathan
2. Biochemistry, 4th Edition, U. Satyanarayana , U. Chakrapani
3. Lippincott's Illustrated Reviews Biochemistry: Biochemistry, 5th Edition (REFERENCE)
4. Tietz,Norbeer. Fundamentals of Clinical Chemistry.
5. Understanding Laboratory Tests: A Quick Reference, 1st Edition

Pathology V (Histopathology & Cytopathology)

6. Text book of Pathology by Harsh Mohan
7. Bancroft Theory & practice of Histological techniques.
8. Text book of Pathology by robbins
9. Anatomy & physiology – Ross & Wilson.
10. Di Fiore's Atlas of Histology.

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1. Textbook of Microbiology 9th Edition, Ananthanarayan , Paniker
2. Textbook of Microbiology 4th Edition, C. P. Baveja
3. Mackie and McCartney Practical Medical Microbiology 14th Edition (REFERENCE)
4. Parasitology Protozoology & Helminthology 13th Edition
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3. Laboratory bio safety manual by WHO 3rd Edition
4. Mukherjee, kanai, L. Medical Laboratory Technology (vol I II & III). Tata McCraw- Hill, New Delhi.
5. Talib. VK, Handbook of Medical Laboratory Technology Sponsored by WHO.

BMLT 603: PROJECT PREPARATION AND VIVA

BMLT 604: CHOICE BASED CREDIT PAPER

Option 1. Principles of basic nursing & Hospital infection control
Option 2. Disaster management& human resource management
Option 3. Social psychology& counselling

Syllabus for Option 1. (Principles of basic nursing & hospital infection control)

Admission to the hospital.
- Unit and its preparation admission bed.
- Admission procedure.
- Medico-legal issues.
- Roles and Responsibilities of the nurse.

Discharge from the hospital
-Types: Planned discharge, LAMA and abscond,
-Referrals and transfers.
- Medico-legal issue.
- Roles and Responsibilities of the nurse.
- Care of the Unit after discharge.

Communication:
- Levels, Elements, Types, Modes, Process, Factors influencing Communication.
- Methods of Effective Communication.
- Helping Relationships (NPR) : Dimensions of Helping Relationships, Phases of a helping relationship
- Communication effectively with patient, families and team members and maintain effective human relations with special reference to communicating with vulnerable group.
- Patient Teaching: Importance, Purpose, Process, role of nurse and Integrating teaching in Nursing Process.

Vital Signs
- Guidelines for taking vital signs
- Body temperature
- Pulse:
- Respiration
- Blood Pressure:
- Recording of vital signs.

Health Assessment
- Purposes.
- Process of Health assessment.

Documentation
- Purposes of Recording and reporting.
- Guidelines for Reporting: Factual Basis, Accuracy, Completeness, Current issue, Organization and Confidentiality.

- Methods of Recording.

Meeting patient needs
Hygienic needs, Nutritional needs, Elimination needs, Comfort needs, Psychological needs,
Infection control

- Organization of the Infection Control Programme at the CMCH.
- Surveillance & Reporting of Infection.
- Employee Health Programme.
- Preventing Transmission of Blood Borne Pathogens.
- Regulation of Staff with Specific Diseases.
- Techniques.
- Care of Access Systems, Indwelling Devices and Wound.
- Isolation Policies and Procedures.
- Disinfection and Sterilization.
- Hospital Waste Management.
- Housekeeping.
- Common Areas of Patient Care.
- Specific Areas of Patient Care.
- Outbreak Management.

References- Hospital Infection Control Manual, 6th edition 2015, CMC, Vellore.

Syllabus for Option 2. (Disaster management & human resource management)

Disaster management

Introduction to disaster

- What is Disaster Management?
- Aim of Disaster Management
- Types of Disasters
- Identifying potential Disasters
- Risk and threats

Disaster Management Process

- Prevention / Mitigation
- Preparedness
- Response
- Recovery
- Rehabilitation

Hospital Disaster Preparedness and Emergency Response Plan

- Introduction to Hospital Emergency Incidence Command System (HEICS)
- Basic Units of HEICS.
- Job action sheets/ cards.
- Disaster Triage.
- Types of Triage.
- Triage exercise (Practical exercise)

Mock drills in a healthcare facility

- Disaster codes
- Fire drill

References:
· CMAI Disaster management workshop.
· EHA – Emergency Response framework.

·WHO – Disaster management.

Human resource management

Recruitment and selection

- Definition
- Recruitment and Planning
- Process of Recruitment
- Flow chart of recruitment
- Joining Formalities

Performance appraisal

- Definition
- Types of Performance appraisal
- Procedure of appraisal
- Importance of appraisal

Compensation and Benefits

- Definition
- Different types of Compensation and Benefits

Business communication

- Definition
- Business writing

Disciplinary procedures and employee misconduct

- Definition
- Important of Disciplinary procedure

Grievance and its procedures

- Definition of Employee Grievance
- Procedure of Employee Grievances
- Importance of Grievance procedure

Exit Interview

- Definition
- Procedure of Exit Interview
- Importance of Exit Interview

Reference:

1.Human Resource Management - by Biswajeet P
2. Human Resource Development - by P Murali Krishna
3. Human Resource Management in Hospitals - D Samuel Abraham

SYLLABUS FOR OPTION 3. (SOCIAL PSYCHOLOGY & COUNSELLING)

Basic skills of counselling, Basics of Theory and Practice of Counselling and Psychotherapy, Basics of group counselling and its dynamics

Social Self

Self and identity. Culture and development of self.
Social cognition; impression management
Attribution, bias and errors in attribution.
Prejudice, stereotypes and discrimination;
Attitude organization; methods of attitudes change

Social Relationships

Nature, dimensions and dynamics of interpersonal relationships; Interpersonal attraction; Sexuality and intimacy; Alternate gender/ sexual minorities
Altruism: Influences of helping; Long-term helpfulness
Aggression: Nature and characteristics; Violence- sexual harassment, domestic violence, terrorism.

Culture and Behaviour

Cross-cultural psychology.
Diversity in socialization; Individualism in a collectivistic culture; Poverty and deprivation.
Culture and psychopathology; Traditional healing methods for mental illness.

Social and Cultural Issues

Gender and mental health
Complex environment and behaviour
Social psychology in educational context
Social psychology at work- application in job satisfaction and performance

References: Berry, J.W., Mishra, R.C. &Tripathi, R.C. (Eds). (2003). *Psychology in human and social development: lessons from diverse cultures*. New Delhi: Sage

Dasen, P.R. Berry, J.W. & Sartorius, N. (1988) (Eds.). *Health and cross- cultural psychology: toward applications*. New Delhi: Sage