

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Sc. In Medical Lab Technology
(Effective for Academic Session 2018-2019)

B.Sc. MLT- I Semester

Course/ Paper: (Human Anatomy-I)

Course Code: BML-101

Learning Objective: The prime concern of this syllabus is to learn the terminology of the subject and basic knowledge of cells & tissues and to understand anatomy of human body. This subject will develop an understanding of the structure and function of organs and organ systems in normal human body.

Unit -1

Terminology and General Plan of the Body, Body Parts and Areas,
Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity,
Ventral cavity, Planes and Sections

Unit –II

Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles,
Cell division
Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective
Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue.
The Integumentary System: structure and function of The Skin, Subcutaneous Tissue

Unit-III

Musculoskeletal System: Basic anatomy of important muscles and bones

Unit-IV

Respiratory system: Basic anatomy of nose, larynx, trachea, bronchi and lungs

Unit – V

Digestive system: basic anatomy of oesophagus, stomach, small intestine, large
intestine, liver, gall bladder, pancreas

Learning Outcome: Students will develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy and recognize the anatomical structures included in syllabus.

Suggested Readings:

1. Ross & Wilson,(2014),Anatomy & Physiology in health & illness,11th edition, Elsevier Publications
2. Chaurasia B D, (2016), Human Anatomy, 7th edition, CBS publishers
3. Gerard J. Tortora and Bryan H.Derrickson,(Principles of Anatomy and Physiology,14th edition,Wiley Publications

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B.Sc. MLT- I Semester

Course/Paper: Human Physiology-I

Course Code: BML-102

Learning Objective: The prime concern of this syllabus is to integrate basic knowledge of cells, tissues, blood, physiological functions and diseases of system included in syllabus.

Unit-I

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

Unit-II

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation

Lymphatic system-Composition & function of lymph, lymphatic tissue, Immunity with the role of thymus

Unit-III

Cardiovascular system-general arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension & shock

Unit-IV

Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transport between lungs and tissues,

Definition of hypoxia, dyspnoea, cyanosis, asphyxia and obstructive airways diseases

Unit- V

Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastrointestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & function of liver, spleen, gall bladder & pancreas, Jaundice, Cirrhosis & Pancreatitis

Learning Outcome: This subject will develop an understanding of the function of organs and organ systems in normal human body. Students will able to explain the physiological systems of body and also understand the basis of diseases.

Suggested Readings:

1. Ross & Wilson,(2014),Anatomy & Physiology in health & illness,11th edition, Elsevier Publications
2. Sujit Chaudhury,(2011),Concise Medical Physiology,6th edition, NCBA
3. Sembulingam k,(2012),Essentials of Medical Physiology,6th edition, Jaypee Publications
4. Guyton and Hall,(2011) Textbook of Medical Physiology,12th Edition,Saunders/Elsevier
5. Gerard J. Tortora and Bryan H.Derrickson,(Principles of Anatomy and Physiology,14th edition,Wiley publications

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B.Sc. MLT- I Semester

Course/Paper: Biochemistry-I

Course Code: BML-103

Learning Objective: This syllabus has been formulated to impart basics knowledge of biochemistry, apparatus, units, equipment, and volumetric analysis in the Clinical Biochemistry.

Unit-I

Introduction to Clinical Biochemistry and role of Medical Lab Technologist, ethics, responsibility, safety measure and hazards in clinical biochemistry lab and first aid in laboratory accidents.

Glassware's & plastic ware's used in lab, calibration of volumetric apparatus, cleaning & care and maintenance

Unit II

Principle, working, care & maintenance and calibration of Weighing balance, Hotplate, Magnetic stirrer, Centrifuges, Incubator, Hot air oven, Colorimeter, Spectrophotometer, Water distillation plant, Deionizers Henderson Hassel balch equation, pH paper, pH meter, method of pH measurement,

Unit-III

Preparation of solution and reagents, normal solution, molar solutions, percent solution, buffer solution, dilutions, w/v, v/v, standard solution, aqueous solutions, concepts of acid and base

Units of measurement: SI unit, reference range, conversion factor, units for measurement of bio metabolite, enzymes, protein, drugs, hormones, vitamins

Unit-IV

Specimen collection and processing of blood, urine & CSF, separation of serum and plasma, deproteinization of sample, Handling of specimens for testing, preservation of specimen, transport of specimen, factors affecting the clinical results, effect of storage on sample

Unit- V

Physical, chemical and microscopic examination of urine, Bence Jones Proteinuria and its clinical significance, qualitative test of urine for reducing sugars, protein, ketone bodies, bile Salt, bile pigments, urobilinogen, occult blood, uric acid, urea and Creatinine, quantitative estimation of 24 hrs urine for protein and their clinical significance.

Learning Outcome: Students will know the basics of reagent preparation, instrument handling and can perform common analytical in Clinical Biochemistry.

Suggested Readings:

1. D M Vasudevan, (2011), Text book of Medical Biochemistry, 6th edition Jaypee Publishers
2. M N Chatterjea & Rana Shinde, (2012), Text book of Medical Biochemistry, 8th edition, Jaypee Publications
3. Singh & Sahni, (2008), Introductory Practical Biochemistry, 2nd edition, Alpha science
4. Lehninger, (2013), Principles of Biochemistry, 6th edition, W H Freeman
5. U Satyanarayan, (2008), Essentials of Biochemistry, 2nd edition, Standard Publishers

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B.Sc. MLT- I Semester

Course/Paper: Health Education & Health Communication

Course Code: BML-104

Unit 1:

- Health Education: Principles & Objectives, Levels of Health Education, Educational Methods, Evaluation & Practice of Health Education in India.
- Health Counseling: Introduction, Theories, Process & Techniques.
- Health Care Reporting, Role of NIC & Other Bodies, Research in Health Education

Unit 2:

- Health Communication: Basic Concept & Principles of Communication, Definition, Purpose, Types of Communication
- Communication Process, Directions of Communication: Upward, Downward, Lateral, Factors influencing Communication, Barriers of Effective Communication, How to overcome the Barriers
- Models of communication: Aristotle Model, Shannon and Weaver model, Schramm Model, Laegans Model, Fano Model, Litterer's Model, Westly Maclean's Model.

Unit 3:

- Mass communication & Role of Media in health education
- Information Communication Technologies (ICT) in health care and awareness. (Telemedicine & e-health, community radio)
- Future trends in information and communications systems :

Suggested Books:

1. Health Education – A new approach – L. Ramachandran & T. Dharmalingan
2. Health Communication in the 21st Century, By Kevin B. Wright, Lisa Sparks, H. Dan O'Hair, Blackwell publishing limited, 2013, first edition
3. Health Communication: From Theory to Practice, By Renata Schiavo, Published by Jossey Bash.
4. Health Communication, R.D. Karma Published by Mohit Publications 2008.
5. Counseling Skills for Health Care Professionals, 1st Edition, Rajinikanth AM, Jaypee Brothers, 2010.

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BML-191 (PC Software Lab)

- Introduction
- MS Windows(Windows '98 Second Edition)
- Desktop, creation of folders and shortcuts, features of Windows explorer
- Familiarisation and using MS packages – Word, Excel, PowerPoint, basic skills in using these tools. (Version MS-Office'2000)

Books:

- 1.Introduction to Computers with MS-Office, Leon, TMH
- 2.Personal Computer Software, EXCEL BOOKS
- 3.A First Course in Computers 2003, Saxena, VIKAS
- 4.Computer Concepts & Windows,Stoline,SPD/LABYRINTH
- 5.Windows'98 in easy steps,Harshad Kotecha, Wiley Dreamtech
- 6.Office 2000 in easy steps, Stephen Copestake, Wiley Dreamtech
- 7.Windows & MS-Office 2000, Krishnan, SCITECH
- 8.Trouble Shooting Microsoft Windows,PHI/MSP

BML-192 (Practical Human Anatomy-I)

1. Demonstration of Major organs through models and permanent slides.
2. Demonstration of parts of circulatory system from models.
3. Demonstration of parts of respiratory system from models.
4. Demonstration of digestive system from models.
5. Demonstration of excretory system from models.
6. Demonstration of nervous system from models.
7. Structure of eye and ear
8. Demonstration of structural differences between skeletal, smooth and cardiac muscles.
9. Demonstration of various bones
10. Demonstration of various joints
11. Demonstration of various parts of male & female reproductive system from models

BML-193 (Practical Human Physiology-I)

1. To measure pulse rate
2. To measure blood pressure
3. Demonstration of ECG
4. To perform Hemoglobin by Sahli's Method
5. To perform Hemoglobin by CMG method.
6. Haemoglobin by CMG method.
7. To perform Total RBC count.
8. To perform total leucocyte count.
9. To perform differential leucocyte count.
10. To perform PCV
11. To calculate Red cell indices.

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BML-194 (Practical Biochemistry-I)

1. To study general laboratory safety rules.
2. To demonstrate glasswares, apparatus and plasticwares used in laboratory.
3. Collection of blood sample
4. To separate serum and plasma.
5. Preparation of different percentage solutions
6. Preparation of normal and molar solutions. (0.1 N NaOH, 0.2N HCl, 0.1 M H₂SO₄)
7. Demonstration of photocolormeter
8. Demonstration of spectrophotometer
9. Demonstration of pH meter
10. Deproteinization of blood sample