

DETAILED SYLLABUS

(DMLT)

**(DIPLOMA IN MEDICAL LABORATORY
TECHNOLOGY)**

(YEARLY PROGRAM)

DMLT (Diploma In Medical Laboratory Technology)

:

COURSE TITLE

DMLT

: 2

YEAR

DURATION

FIRST YEAR

COURSE TITLE

PAPER CODE

Theory

MARKS

Practical

Total

ANATOMY 1 st	DMLT—110	100	100	200
PATHOLOGY 1 st	DMLT —120	100	100	200
BIOCHEMISTRY 1 st	DMLT —130	100	100	200
MICROBIOLOGY 1 st	DMLT - 140	100	100	200
PHYSIOLOGY 1 st	DMLT —150	100	100	200

TOTAL

1000

**SECOND
YEAR**

COURSE TITLE

PAPER CODE

MARKS

ANATOMY 2 nd	DMLT —250	100	100	200
PATHOLOGY 2 nd	DMLT —220	100	100	200
BIOCHEMISTRY 2 nd	DMLT —230	100	100	200
MICROBIOLOGY 2 nd	DMLT - 240	100	100	200
PHYSIOLOGY 2 nd	DMLT —210	100	100	200

TOTAL

1000

Note:

Theory Paper :30% Continuous Internal Assessment and 70% University examination. Practical Paper : 30% Continuous Internal Assessment and 70% University examination

DMLT - 110

ANATOMY

**Maximum Time : 3 hrs University
Assessment -70%**

Total marks :200 Internal Assessment - 30%

Minimum Pass Mark - 40%

COURSE CONTENTS - THEORY

Introduction of Bones of the Human Body of :

- Upper Limb : clavicle, scapula, humerus, radius, ulna, carpus, metacarpus & phalanges
 - Lower Limb : hipbone, femur, tibia, fibula, tarsus, metatarsus & phalanges
 - Skull : name the bone of skull and sutures between them
 - Thorax : ribs and their articulations
- Vertebral Column : Cervical, thoracic, lumbar, sacral and coccygeal vertebrae

Surface Markings of the Body :

Nine regions of the abdomen

Four quadrants of the Hip

Introduction of different Vital

Organs : A) Respiratory

Organs :

Nasopharynx

Oropharynx

Larynx

Trachea

Bronchi

Lungs (and their lobular segments)

Thoracic cavity

Pleura and Pleural cavity

B) Circulatory Organs :

Anatomical position of the heart

Pericardium of the heart

Chambers of the heart

Great vessels of the heart

Valves of the heart

C) Digestive Organs :

Tongue

Teeth

Oral cavity
Pharynx
Oesophagus
Stomach
Small intestine
Large intestine and its colons

Reproductive Organs :

- 0 Male & Female Gonads : Testes, Epididymis, Ovary, Fallopian Tube, Uterus, Vagina etc.
- 1 Introduction of male Genital Organs
- 2 Introduction of female Genital Organs

Liver and Spleen :

- 0 Introduction
- 1 Anatomical Position
- 2 Gall bladder

Excretory Organs ;

- 0 Cortex and medulla of kidney
- 1 Ureter
- 2 Urinary Bladder
- 3 Urethra (male and female)

Muscles :

- 0 Introduction, Origin and Insertion, Function

PRACTICAL

100 MARKS

Labeled Diagrams of different organs and bones

Vivo

Labeled Diagrams of different organs and bones Vivo

DMLT - 120

PATHOLOGY

**Maximum Time : 3
hrs**

**Total
marks :200**

**University
Assessment -70%
Internal
Assessment -**

2300% Minimum Pass Mark - 40%

COURSE CONTENTS -

The Cell in health and disease

Introduction of pathology
Cellular structure and metabolism
Inflammation - Acute and Chronic
Derangement of Body Fluids and Electrolytes
0 Types of shocks
1 Ischaemia
2 Infection
Neoplasia - Etiology and Pathogenesis

Introduction of hematology

Formation of Blood
Erythropoiesis
Leucopoiesis
Thrombopoiesis
Collection of Blood
Anticoagulants
Red cell count - Haemocytometer, Methods and Calculation
WBC Count -- Methods
Differential Leucocytes Count (DLC)--
Morphology of White Cells, Normal
Values Rananocosty Stains :
Staining procedures Counting
Methods, Principle of staining
Hb estimation -
Method
Colorimetric
Method Chemical
Method Gasometric
Method S.G.
Method
Clinical Importance

Hematology :

ESR

Methods

Factors – Affecting ESR

Normal Values

Importance

RBC – Indices

WBC

- Platelets

BodyFluids:

Urine :

Method of Collection

Normal Constituents

Physical Examination

Chemical Examination

Stool Examination :

Method of Collection

Normal Constituents and appearance

Abnormal Constituents (Ova, Cyst)

C.S.F. Examination

Physical Examination

Chemical Examination

Microscopy

Cell 1 Count

Staining

Semen Analysis

Collection

Examination

Special Tests

Practical : MARKS

100

- Collection of Sample
- Hb estimation
- TLC and DLC
- RBC Count
- Peripheral blood film – staining and study of Malarial Parasite

Laboratory management – Sample Collection, Labeling,
Transport, Screening, Reporting and Dispatch of Reports.

Urinek, Stool, Semen and C.S.F. – Collection, Handling, Examinations
Absolute Eosinophil Count, PCV, RBC indices, ESR Estimation, Platelet Count

DMLT - 130

BIOCHEMISTRY

**Maximum Time : 3
hrs**

**Total
marks :200**

**University
Assessment -70%
Internal Assessment
- 30%**

Minimum Pass Mark - 40%

COURSE CONTENTS -

Introduction of Biochemistry
Elementary knowledge of inorganic chemistry :- Atomic weight, molecular weight, equivalent weight, acid, bases.
Definition and preparation of solutions : Percent solution, Molar solution, Normal Solution and Buffer Solution etc.
Definition and preparation of Regent.
Unit of measurement
Elementary knowledge of organic chemistry
Organic compounds
Aliphatic and Aromatic
Alcohols, Aldehydes, Ketones, Amines, Esters, Phenol etc
Ph indicators : pH paper, universal and other indicators, pH measurement : different methods.

Practical MARKS

100

Introduction and usage of Glassware and Instruments

Glassware :

Composition of Glass
General Glass wares

Instruments :

Balance
Hot Plate and Magnetic stirrer
Centrifuges
Incubators
Constant temperature bath
Colorimeter : Principal, Function
Photometer
Flame Photometry

Aim and Scope of Biochemistry

Collection and Recording of Biochemical Specimen, separation of serum/plasma preservation and disposal of Biological material.

Chemical examination of urine : Qualitative, Sugar, Protein, Bile Salt, Bile Pigment, Ketones Bodies

Chemical examination of Stool : Occult Blood.

Chemical examination of other Body Fluids : CSF, Plural Fluids, Ascitic Fluid etc.

Laboratory management and Maintenance of Records.

Urine Examination physical, Chemical, Microscopic, Biochemistry

Stool Examination

Body Fluids : Physical and chemical examination CSF, Pleural Fluids, and Ascitic fluid

DMLT - 140

MICROBIOLOGY

**Maximum Time : 3
hrs**

**Total
marks :200**

**University
Assessment -70%
Internal Assessment
- 30%**

Minimum Pass Mark - 40%

COURSE CONTENTS -

Introduction of brief history of Microbiology

Historical Aspect

Relationship of Micro-organism to men

Micro-organism in Disease and Health

Requirement and uses of common Laboratory Equipments

Incubator, Hot Air Oven, Water Bath

Anaerobic Jar, Centrifuge, Autoclave

Microscope

Glassware – Discription of Glassware, its use, handling and care

Sterilization :

Definition

Classification and General Principal of Sterlization

Autoclave – its structure, functioning, control and indicator

Definition

Types

Mode of Action

Uses

Collection, Transportation and processing of clinical samples for

Microbiological Investigations

Bacteiology

Definition

Bacteria – General characteristics of Bacteria

Classification and morphology of Bacteria

Structure of Cell, Capsule, Flagella, and Spore

Growth of Bacteria

Nutrition of Bacteria

Virology :

Definition

General Introduction of Virus

Physiochemical characteristic of Viruses

Diseases caused by different Virus and mode of infection

Parasitology :

Definition

General Characteristics of Parasite

Classification of Parasite

Mode of transmission

Fungus :

Definition

Structure

Classification

**Practical :
MARKS**

100

Staining – Type of Staining, Principal, Procedure and Interpretation

Demonstration of washing of instruments

DMLT - 150

PHYSIOLOGY

Maximum Time : 3 hrs University Assessment -70%

Total marks :200 Internal Assessment - 30%

Minimum Pass Mark - 40%

COURSE CONTENTS

Cell :

0 **Definition**

1 **Structure and functions the cytoplasmic Organelles**

2 **Reproduction : Miosis, Mitosis**

The important physic-chemical laws applied to physiology

Diffusion

Osmosis

Bonding

Filtration

Dialysis

Surface Tension

Adsorption

Colloid

Fundamentals of different Organ Systems

Cardiovascular System

Respiratory System

Digestive System

Excretory System

Reproduction System

Endocrine System

Lymphatic System

Practical

Viva and diagrams of different Vital Organs

Practical :

100 MARKS

Viva and diagrams of different Vital Organs

DMLT - 210

PHYSIOLOGY

**Maximum Time : 3
hrs**

**Total
marks :200**

**University
Assessment -70%
Internal Assessment
- 30%**

Minimum Pass Mark - 40%

COURSE CONTENTS

Blood

Definition

Composition

Function

Formation of different type of blood cells

Erythrocytes

Leucocytes

Thrombocytes

Mechanism of Blood Clotting

Cerebrospinal Fluid

Formation

Composition

Function

Special Senses

Hearing

Taste

Smell

Touch

Sight

PRACTICAL :

100 Marks

Viva and diagrams of Corpuscles

DMLT - 220

PATHOLOGY

Maximum Time : 3 hrs University Assessment -70%

Total marks :200 Internal Assessment - 30%

Minimum Pass Mark - 40%

COURSE CONTENTS

Human blood group antigens and antibodies

ABO Blood group systems

Sub. – group

Source of antigens and types of antibodies

Rh Blood group System

Types of Antigen

Mode of Inheritance

Types of Antibodies

Other Blood group Antigens

Blood Collection

Selection and screening of donor

Collection of blood

Various anticoagulants

Storage of Blood

Changes in Blood on Storage

PRACTICAL :

Blood grouping

Tube Method

Slide Method

DMLT - 230

BIOCHEMISTRY

**Maximum Time : 3
hrs**

**Total
marks :200**

**University
Assessment -70%
Internal Assessment
- 30%**

Minimum Pass Mark - 40%

COURSE CONTENTS

Carbohydrates :-

- Introduction
- Importance
- Classification
- Properties
- Estimation of Glucose
- Clinical Significance

Protein : -

- Introduction and Physiological importance
- Amino acids
- Essential amino acids
- Classification
- Denaturation of Proteins
- Estimation of Total protein, Albumin, Globulin, A/G Ratio
- Introduction, Properties and function of important hormones
- Enzymes and Co-enzymes

- Introduction and difference
- Functions
- Estimation of important enzymes

- 0 SGOT (AST)
- 1 SGPT (ALT)
- 2 Alkaline Phosphatase
- 3 Acid Phosphatase
- 4 Amylase, lactate dehydrogenase
- 5 CPK, CPK-MB

Lipids : -

- Introduction and functions
- Classification
- Steroids

Metabolism

Estimation : Total lipids, HDL, LDL, VLDL, Total cholesterol, Triglyceride

Clinical significance

Principal of Assay procedures for biological material and estimation of kidney function tests.

Urea

Uric acid

Creatinine

Electrolytes :

Function

Properties

Estimation of Essential electrolytes : Sodium, potassium, calcium, chloride and Phosphorus etc.

Clinical Importance

Genetics

DNA, RNA Structure

Gene coding

Transcription & Translation

Genetic Disorders

PRACTICAL :

**100
Marks**

Method of estimation of Urea

Method of estimation of Creatinine

Method of estimation of Cholesterol

Method of estimation of glucose : Benedict's Reaction, Glucose oxidase

Method

Method of estimation of P

DMLT - 240

MICROBIOLOGY

**Maximum Time : 3
hrs**

**Total
marks :200**

**University
Assessment -70%
Internal Assessment
- 30%**

Minimum Pass Mark - 40%

COURSE CONTENTS

Staining of Bacteria :

Composition and preparation of staining
Principal and Procedure of Bacteriological stain
Gram's Stain
Ziehl-Neelsen Stain
Albert Stain
Spore and Negative Stain

Cultivation of Micro-organism :

Introduction and uses of culture
Classification of culture media
Composition of common of Laboratory culture media
Special media and preparations
Techniques of inoculation and isolation
Antimicrobial sensitivity
Anaerobic cultivation techniques

Isolation of Viruses in Laboratory by tissue culture

Cell and tissue culture technology
Embryonated Egg
Principles of animal cell culture and their use in Virology

Different staining techniques used in
Virology Principle of different serological
test used in Virology Mode of Transmission
of Viral agents Prevention of Viral disease
Immunity in Viral infection

Immunology

Definition

Immunity : Definition and Classification

Antigen

Antibodies – Immunoglobulin

Antigen and antibody reaction and clinical importance

Structure and function of immune system

Immune response

Hypersensitivity

I Principal & Procedure of Serological Tests.

BICAL, CRP, Brucella, Agglutination, ASO

Cold agglutination, VDRL, TPHA

Advanced techniques in Microbiology ELISA, RIA etc.

Epidemiological Markers of Micro-organism serotyping

Preparation & Standardization of Antigen and Antisera

Preparation & Standardization of vaccine and immunization

I) General Introduction, life cycle, mode of transmission, pathogenicity, and lab diagnosis of various Protozoa.

Entamoeba Histolytica

Entamoeba coli

Giardia lamblia

Trichomonas Vaginalis

Leishmania donovani

Sporozoa

- Malaria Parasite
 - Toxoplasma Gondii
- Balantidium Coli

General Introduction life cycle, mode of transmission, pathogenicity and lab diagnosis of various Helminths :

Cestodes or Tapeworms :

Taenia solium

Taenia saginata

Hymenolepis nana

Echinococcus granulosus

Trematodes of Flukes :

Fasciola hepatica

Fasciola gigantica

Gestrodiscoides hominis

Nematodes :

Trichinella spiralis

Trichuris trichiura

Ancylostoma duodenale

Enterobius vermicularis

Ascaris lumbricoides

**PRACTICAL :
Marks**

100

Demonstration :-

Slide Agglutination

VDRL

VIDAL

ASO

CRP

Stool Examination

Physical

Microscopic Demonstration of Ova, Cyst, Pus, Cells

Hanging Drop Examination

Staining : ZN Staining of M.T.B. and M. Lepra, Albert Staining
Culture

Types of Media

Preparation

Inoculation

Colony Characteristic

Staining and Antibiotic Sensitivity

DMLT - 250

ANATOMY

Maximum Time : 3 hrs University Assessment -70%

Total marks :200 Internal Assessment - 30%

Minimum Pass Mark - 40%

COURSE CONTENTS - THEORY

100 Marks

Reproductive Organs :

Male & Female Conads : Testes, Epididymis, Ovary, Fallopian
Tube, Uterus, Vagine etc.

Introduction of male Genital Organs

Introduction of female Genital Organs

Liver and Spleen :

Introduction

Anatomical Position

Gal bladder

Excretory Organs ;

Cortex and medulla of kidney

Ureter

Urinary Bladder

Urethra (male and female)

Muscles :

Introduction, Origin and Insertion, Function

PRACTICAL

100 Marks

Labeled Diagrams of different organs and bones

Vivo

Labeled Digrams of different organs and bones Vivo

