

FACULTY OF LIFE-SCIENCES

SYLLABUS

Of

Diploma in Medical Lab Technology

(Semester I & II)

(Under Credit Based Continuous Evaluation Grading System)

Session: 2018-19



The Heritage Institution

**KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)**

Scheme of Studies and Examination (Session 2018-19)
Diploma in Medical Lab Technology

Semester I									
Paper No.	C/S/I/ V/E	Paper Title	Hours/ week	Credits L-T-P	Marks				Examination time (in Hours)
					Total	Ext.		CA	
						L	P		
DMTL-1481	C	Basics of Anatomy	2	2-0-0	50	40	-	10	3
DMTL-1102	C	Communication skills in English	2	2-0-0	50	40	-	10	3
DMTL-1483	C	Biochemistry	2	2-0-0	50	40	-	10	3
DMTL-1484	C	Haematology	2	2-0-0	50	40	-	10	3
DMTL-1485	C	Microbiology	2	2-0-0	50	40	-	10	3
DMTP-1486	C	Basics of Anatomy	6	0-0-3	100	-	80	20	3
DMTP-1487	C	Biochemistry	6	0-0-3	100	-	80	20	3
DMTP-1488	C	Haematology	6	0-0-3	100	-	80	20	3
DMTP-1489	C	Microbiology	6	0-0-3	100	-	80	20	3
Total				22	650				

Semester II									
Paper No.	C/S/I/ V/E	Paper Title	Hours/ week	Credits L-T-P	Max Marks				Examination time (in Hours)
					Total	Ext.		CA	
						L	P		
DMTL-2481	C	Basics of Physiology	2	2-0-0	50	40	-	10	3
DMTM-2102	C	Communication skills in English	2	2-0-0	50	25	15	10	3+3
DMTL-2483	C	Biochemistry	2	2-0-0	50	40	-	10	3
DMTL-2484	C	Haematology	2	2-0-0	50	40	-	10	3
DMTI-2485	I	Internship	10	0-0-5	150	-	120	30	3
DMTP-2486	C	Basics of Physiology	6	0-0-3	100	-	80	20	3
DMTP-2487	C	Biochemistry	6	0-0-3	100	-	80	20	3
DMTP-2488	C	Haematology	6	0-0-3	100	-	80	20	3
TOTAL				22	650				

SEMESTER-I

(Session 2018-19)

DMTT-1471 BASICS OF ANATOMY

(THEORY)

TIME- 3 HOURS

Hours/week: 2

Credits: L-T-P

2 -0- 0

Max Marks: 50

Theory Marks: 40

CA:10

INSTRUCTIONS: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

The anatomical organization of human body. Introduction of different Vital Organs:

A) Respiratory Organs:

- Nasopharynx
- Oropharynx
- Larynx
- Trachea
- Bronchi
- Lungs
- Thoracic cavity
- Pleura and Pleural cavity

UNIT-II

B) Circulatory Organs

- Anatomy of the heart

UNIT-III

C) Digestive Organs:

- Tongue
- Teeth
- Oral cavity
- Pharynx
- Oesophagus
- Stomach
- Small intestine
- Large intestine and its colons Liver, Pancreas and Spleen

D) Reproductive Organs:

- Male and Female Gonads

UNIT-IV

E) Excretory Organs:

- Cortex and medulla of Kidney
- Ureters
- Urinary Bladder
- Urethra (male and female)

F) Skeletal system:

Bones, joints and muscles.

SEMESTER-I

(Session 2018-19)

DMTL-1476 BASICS OF ANATOMY

(PRACTICAL)

TIME- 3 HOURS

Hours/week: 6

Credits: L-T-P

0- 0-3

Max Marks: 100

Practical Marks: 80

CA:20

PRACTICAL:

Study of various organs through Charts and models.

SEMESTER-I
(Session 2018-19)
DMTT-1472 BIOCHEMISTRY
(THEORY)

TIME- 3 HOURS
Hours/week: 2
Credits: L-T-P
2-0- 0

Max Marks: 50
Theory Marks: 40
CA:10

INSTRUCTIONS: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Introduction to medical technology, role of medical laboratory, technologists, ethics, responsibility, safety measure, first aid (accidents).

UNIT-II

Introduction, properties and simple metabolism of carbohydrates.

UNIT-III

Introduction, properties and simple metabolism of proteins and fat.

UNIT-IV

Introduction and general properties of Nucleic acids and Enzymes.

SEMESTER-I

(Session 2018-19)

DMTL-1477 BIOCHEMISTRY

(PRACTICAL)

TIME- 3 HOURS

Hours/week: 6

Credits: L-T-P

0- 0-3

Max Marks: 100

Practical Marks: 80

CA:20

1. Preparation of laboratory reagents and standard solutions, storage of chemicals.
2. Units of measurements. S.I. Units, measurement of volume, volumetric apparatus (pipettes, flasks, Cylinders), Calibration of volumetric apparatus.
3. Introduction and usage of Glassware and Instruments.

Instruments: • Balance • Hot plate and Magnetic stirrer • Centrifuges

SEMESTER-I
(Session 2018-19)
DMTT-1473 HAEMATOLOGY
(THEORY)

TIME- 3 HOURS
Hours/week: 2
Credits: L-T-P
2-0- 0

Max Marks: 50
Theory Marks: 40
CA:10

INSTRUCTIONS: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Introduction to haematology and laboratory organization Lab safety and Instrumentation.

UNIT-II

Formation of blood.

Composition and functions of blood.

UNIT-III

Various anticoagulants, their uses, mode of action and their merits and demerits.

Normal and absolute in haematology.

UNIT-IV

Physiological variations in HB, PCV, TLC and platelets.

Quality assurance in hematology.

SEMESTER-I
(Session 2018-19)
DMTL-1478 HAEMATOLOGY
(PRACTICAL)

TIME- 3 HOURS
Hours/week: 6
Credits: L-T-P
0- 0-3

Max Marks: 100
Practical Marks: 80
CA:20

PRACTICALS:

- Collection & preservation of blood for various hematological investigations.
- Preparation of blood smears.
- Total leukocyte count and Differential leukocyte count.

SEMESTER-I
(Session 2018-19)
DMTT-1474 MICROBIOLOGY
(THEORY)

TIME- 3 HOURS
Hours/week: 2
Credits: L-T-P
2-0- 0

Max Marks: 50
Theory Marks: 40
CA:10

INSTRUCTIONS: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Introduction and brief history of microbiology.

Safety measures in microbiology.

UNIT-II

General characteristics and classification of bacteria and fungi.

Growth and nutrition of microbes.

Care and handling of various microscopes-Binocular, DGI, Phase contrast, fluorescence and electron microscopes.

UNIT-III

Principles and methods of sterilization.

Uses and mode of action antiseptics and disinfectants.

UNIT-IV

Preparation, uses and standardization of culture media.

Principles of staining methods and preparation of reagents.

Personnel hygiene.

Introduction to parasitology.

SEMESTER-I

(Session 2018-19)

DMTL-1479 MICROBIOLOGY

(PRACTICAL)

TIME- 3 HOURS

Hours/week: 6

Credits: L-T-P

0- 0-3

Max Marks: 100

Practical Marks: 80

CA:20

PRACTICALS: Requirement and uses of common Laboratory Equipments

- Incubator, Hot Air Oven, Water Bath
- Anaerobic Jar, Centrifuge, Autoclave
- Microscope
- Glassware –Description of Glassware, its use, handling and care III. Sterilization :
- Definition
- Classification and General Principle of Sterilization
- Autoclave –its structure, functioning, control and indicator Preparation and storage of distilled water Decontamination and disposal of contaminated material.
- Introduction to operation of laboratory instruments and safety precautions.

SEMESTER-II
(Session 2018-19)
DMTT-2471
BASICS OF PHYSIOLOGY
(THEORY)

TIME- 3 HOURS
Hours/week: 2
Credits: L-T-P
2-0- 0

Max Marks: 50
Theory Marks: 40
CA:10

INSTRUCTIONS: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Digestion and absorption.

Nutrition (Vitamins, Calories)

UNIT-II

Mechanism of Blood Clotting

Blood morphology, chemistry and function.

UNIT-III

Respiratory system.

Cardiovascular system

UNIT-IV

Alimentary system, mechanism and physiology of digestion and absorption.

Liver structure and function.

SEMESTER-II

(Session 2018-19)

DMTL-2476 BASICS OF PHYSIOLOGY

(PRACTICAL)

TIME- 3 HOURS

Hours/week: 6

Credits: L-T-P

0- 0-3

Max Marks: 100

Practical Marks: 80

CA:20

PRACTICALS-

- ABO Blood grouping
- Bleeding time
- Clotting time
- Blood Pressure and its measurement

SEMESTER-II
(Session 2018-19)
DMTT-2472 BIOCHEMISTRY
(THEORY)

TIME- 3 HOURS
Hours/week: 2
Credits: L-T-P
2-0- 0

Max Marks: 50
Theory Marks: 40
CA:10

INSTRUCTIONS: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Radio isotopes and their use in Biochemistry, mole, molar and normal solutions pH, buffer solutions, pH-measurement, Osmosis, dialysis, surface tension.

UNIT-II

Collection and recording of biological specimens, separation of serum plasma preservation and disposal of biological samples material.

Disposal of Laboratory waste

UNIT-III

Basic statistics (mean, SD, CV, normal distribution, probability) Normal or Reference range.

UNIT-IV

Volumetric analysis- Preparation of Standard acid and base solutions, chloride estimation.

SEMESTER-II

(Session 2018-19)

DMTL-2477 BIOCHEMISTRY

(PRACTICAL)

TIME- 3 HOURS

Hours/week: 6

Credits: L-T-P

0- 0-3

Max Marks: 100

Practical Marks: 80

CA:20

PRACTICALS

- Urine analysis (qualitative) for physical and chemical constituents i.e. sugar, proteins, bile pigments, ketone bodies, porphobilinogen, faecal occult blood.
- Principal of Assay procedures for biological material and estimation of kidney function tests. Principles and methods of estimation for serum Urea, Uric acid, Creatinine, Cholesterol, Bilirubin.
- Estimation of Essential electrolytes: Sodium, potassium, calcium, chloride and phosphorus etc. Estimation of important enzymes

SEMESTER-II

(Session 2018-19)

DMTT-2473 HAEMATOLOGY

(THEORY)

TIME- 3 HOURS

Hours/week: 2

Credits: L-T-P

2-0- 0

Max Marks: 50

Theory Marks: 40

CA:10

INSTRUCTIONS: Eight questions of equal marks are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Haemoglobinometry, various methods of estimation of Hb, errors involved and standardization of instrument for adaptation for Hb estimation.

Haemocytometry, procedures for cell counts-visual as well as electronic. Red cell, leucocytes and platelet counts. Errors involved and mean to minimize such errors.

UNIT-II

Romanowsky dyes , preparation and staining procedures of blood smears.

Morphology of normal blood cells and their identifications.

UNIT-III

Erythrocyte sedimentation rate, factors influencing ESR and various procedures for its estimation with their significance.

Haematocrit value by macro and micro methods their merits and demerits.

UNIT-IV

Routine examination of urine for microscopy.

Examination of biological fluids such as CSF, stool, sputum etc. Examination of semen.

SEMESTER-II
(Session 2018-19)
DMTL-2478 HAEMATOLOGY
(PRACTICAL)

TIME- 3 HOURS
Hours/week: 6
Credits: L-T-P
0- 0-3

Max Marks: 100
Practical Marks: 80
CA:20

1. Haemoglobinometry, various methods of estimation of Hb, errors involved and standardization of instrument for adaptation for Hb estimation.
2. Haemocytometry, procedures for cell counts-visual as well as electronic. Red cell, leucocytes and platelet counts. Errors involved and mean to minimize such errors.
3. Romanowsky dyes , preparation and staining procedures of blood smears.
4. Morphology of normal blood cells and their identifications.
5. Erythrocyte sedimentation rate, factors influencing ESR and various procedures for its estimation with their significance.
6. Haematocrit value by macro and micro methods their merits and demerits.
7. Routine examination of urine for microscopy.
8. Examination of biological fluids such as CSF, stool, sputum etc.
9. Examination of semen.

SEMESTER-II

(Session 2018-19)

DMTI-2475 INTERNSHIP

TIME- 3 HOURS

Hours/week: 10

Credits: L-T-P

0-0- 5

Max Marks: 150

Practical Marks: 120

CA:30

- **INTERNSHIP FOR ONE MONTH IN A REPUTED MEDICAL LAB.**