INSTITUTE OF ADVANCED STUDIES IN EDUCATION(DEEMED UNIVERSITY)
GANDHI VIDYA MANDIR
SARDARSHAHR

DETAILED SYLLABUS

FOR

DISTANCE EDUCATION

CERTIFICATE IN MEDICAL LABORATORY TECHNOLOGY
(CMLT)

(SEMESTER SYSTEM)

COURSE TITLE : CMLT

DURATION : 3 YEARS

TOTAL DEGREE MARKS : 4900

FIRST SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		Theory	**Practical**	**Total**
ANATOMY	CMLT –110	100	50	150
PATHOLOGY	CMLT – 120	100	100	200
BIOCEMISTRY	CMLT – 130	100	100	200
MICROBIOLOGY	CMLT –140	100	100	200
COMMUNICATION SKILLS	CMLT – 150	50	0	50
			TOTAL	800

SECOND SEMESTER

COURSE TITLE	PAPER CODE	MARKS		
		Theory	**Practical**	**Total**
PHYSIOLOGY	CMLT – 210	100	50	150
PATHOLOGY	CMLT – 220	100	100	200
BIOCHEMISTRY	CMLT – 230	100	100	200
MICROBIOLOGY	CMLT – 240	100	100	200
COMPUTER SKILLS	CMLT – 250	50	0	50
			TOTAL	800

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

Continuous Internal assessment :
1) Two or three tests out of which two Internal 60% of Continuous Assessment will be considered for Assessment

2) Seminars/Assignment/Quizzes Internal Assessment 30% of Continuous

3) Attendance class participation and behavior Internal Assessment 10% ofContinuous

FIRST SEMESTER

CMLT – 110 ANATOMY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS – THEORY

1) 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, lumber, sacral and cocasial vertebrae

2) Surface Markings of the Body :

- Nine regions of the abdomen
- Four quadrants of the Hip

3) 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
- Stomach
- Small intestine
- Large intestine and its colons

PRACTICAL :

Labeled Digrams of different organs and bones
Vivo

CMLT – 120 PATHOLOGY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS –

1. The Cell in health and disease
    a. Introduction of pathology
    b. Cellular structure and metabolism
    c. Inflammation – Acute and Chronic
    d. Derangement of Body Fluids and Electrolytes
        - Types of shocks
        - Ischaemia
        - Infection
    e. Neoplasia – Etiology and Pathojgenesis

2. Introduction of hematology
    a. Formation of Blood
    b. Erythropoiesis
    c. Leucopoiesis
    d. Thrombopoiesis
    e. Collection of Blood
    f. Anticoagulants
    g. Red cell count – Haemocytometer, Methodsand Calculation
    h. WBC Count – Methods
    i. Differential Leucocytes Count (DLC) –
    Morphology of White Cells, Normal Values
    Rananocostry Stains : Staining procedures
    Counting Methods, Principle of staining
    j. Hb estimation - Method
    Colorimetric Method
    Chemical Method
    Gasmetric Method
    S. G. Method
    Clinical Importance

Practical :

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

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

CMLT – 130 BIOCHEMISTRY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS :

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

Practical

Introduction and usage of Glassware and Insturments

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

CMLT – 140 MICROBIOLOGY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS :

I. Introduction and brief history of Microbiology

- Historical Aspect
- Relationship of Micro-organism to men
- Micro-organism in Disease and Health

II. 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

IV. Antiseptics & Disinfectants

- Definition
- Types
- Mode of Action
- Uses

V. Collection, Transportation and processing of clinical samples for Microbiological investigations

Practical :

Demonstration of washing of instruments

CMLT-150 COMMUNICATION SKILL –I

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Basic Skills :- Listening, Speaking, Reading & Writing.
A Practical study of Grammatical Rules (Noun, Pronoun, Adjectives, Verb, Adverb)
Tenses :- Types of Tenses

SECTION B
Idioms & Phrases,
Confused works :- Paronyms, Homonyms
Synonyms, General Abbreviations,
One word Substitution

SECTION C
Simple present, progressive & present perfect, Simple past, progressive & Past perfect, Indication of Futurity, the passive (Present & Past, Present & Past Perfect).
Reported Speech :-

(I) Declarative Sentences	(II) Imperative
(III) Interrogative (Question)	(IV) Active, Passive
(V) Preposition	(VI) Articles

SECTION D
Writing Skills :-
Paragraph Writing, Composition Writing, Report Writing, Application & Letter Writing, Essay Writing.

Reference:

1. Tandon, R.C. Seth, R.R. Agarwal
2. V.K. Maheshwari - “English Grammar and Composition” Ratan Prakashan Mandir.
3. Sidhu, Prem & Kapoor “Collegiate English Grammar Composition & Translation” Khosla Publishing House.

SECOND SEMESTER

CMLT – 210 PHYSIOLOGY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**
Minimum Pass Mark – 40%

COURSE CONTENTS

1. Cell :
    - Definition
    - Structure and functions the cytoplasmic Organelles
    - Reproduction : Miosis, Mitosis
2. The important physico-chemical laws applied to physiology
    - Diffusion
    - Osmosis
    - Bonding
    - Filtration
    - Dialysis
    - Surface Tension
    - Adsorption
    - Colloid
3. Fundamentals of different Organ Systems
    - Cardiovascular System
    - Respiratory System
    - Digestive System
    - Excretory System
    - Reproduction System
    - Endocrine System
    - Lymphatic System
    - Pracitcal
    - Viva and diagrams of different Vital Organs

PRACTICAL

Viva and diagrams of different Vital Organs

CMLT – 220 PATHOLOGY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS

I. Hematology :

- ESR
- Methods
- Factors – Affecting ESR
- Normal Values
- Importance
- RBC – Indices
- Platelets

II. Body Fluids :

a) Urine :
- Method of Collection
- Normal Constitutents
- Physical Examination
- Chemical Examination

b) Stool Examination :
- Method of Collection
- Normal Constituents and appearance
- Abnormal Constituents (Ova, Cyst)

c) C.S.F. Examination
- Physical Examination
- Chemical Examination
- Microscopy
- Celll Count
- Staining

d) Semen Analysis
- Collection
- Examination
- Special Tests

PRACTICAL :

a) Urinek, Stool, Semen and C.S.F. – Collection, Hnadling, Examinations
b) Absolute Eosinophil Count, PCV, RBC indices, ESR Estimation, Platelt Count

CMLT – 230 BIOCHEMISTRY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS

1. Aim and Scope of Biochemistry
2. Collection and Recording of Biochemical Specimen, separation of serum/plasma preservation and siposal of Biological materal.
3. Chemical examination of urine : Qualitative, Sugar, Protein, Bile Salt, Bile Pigment, Ketones Bodies
4. chemical examination of Stool : Occult Blood.
5. Chemical examination of other Body Fluids : CSR, Plural Fluid, Ascitic Fluid etc.
6. Laboratory management and Maintenance of Records.

PRACTICAL :

- Urine Examination Physical, Chemical, Microscopic, Biochemistry
- Stool Examination
- Body Fluids : Physical and chemical examination CSF, Pleural Fluid, and Ascitic fluid

CMLT – 240 MICROBIOLOGY

Maximum Time : 3hrs **University Assessment – 80%**
Total marks :100 **Internal Assessment – 20%**

Minimum Pass Mark – 40%

COURSE CONTENTS

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 ofinfection

Parasitology :

- Definition
- General characteristics of Parasite
- Classification of Parasite
- Mode of transmission

Fungus

- Definition
- Structure
- Classificaiton

PRACTICAL :

Staining – Type of Staining, Principal, Procedure and Interpretation

CMLT-250 COMMUNICATION SKILLS-II

Maximum Time : 3 Hrs. **University Examination : 35 Marks**
Total Marks : 50 **Continuous Internal Assessment : 15 Marks**
Minimum Pass Marks :40%

A) Instructions for paper-setter

1. The question paper will consist five sections namely A, B, C, D and E.
2. Each of the sections A, B, C and D will contain two questions and candidates have to attempt at least one question compulsorily from each section. Each section carry 15% of the total marks
3. Section E will comprise of 10-15 short answers type questions, which will cover the entire syllabus and will carry 40% of the total marks.

B) Instructions for candidates

1. Candidates are required to attempt one question each from sections A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed

SECTION A

1. Corresponding : (Official, Business And Personal)

One Letter from each category (Official, Business and Personal) may be set in the examination paper and the students be asked to write one of them.

SECTION B

2. Grammar

A brief review of easy form of tenses. Conversion of direct narration into indirect form of narration and vice versa (only simple sentences). Punctuation.

SECTION C

3. Essay

Preferably on scientific topic from the given outlines. The paper setter may be instructed to give a choice of attempting one out of three topics. The question paper may provide the outlines. The essay will be of 250 to 300 words. The examiner may select three topics one from each of the following.

(i) Science
(ii) Technology
(iii) General.

SECTION D

Written Communication

report, notices, agenda notes, business correspondence preparation of summery & prices.