

SYLLABUS

COP (CMLT, DMLT & AMLT)

(For candidates admitted from the Academic year 2017 Onwards)



P.G. DEPARTMENT OF ZOOLOGY

JAMAL MOHAMED COLLEGE (AUTONOMOUS)

(Nationally Accredited with 'A' Grade by NAAC)

TIRUCHIRAPPALLI- 620 020.

CAREER ORIENTED PROGRAMME (COP)
P.G. DEPARTMENT OF ZOOLOGY
JAMAL MOHAMED COLLEGE (AUTONOMOUS)

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(For candidates admitted from the Academic year 2017 Onwards)

| Course | Paper Title and code | Hours/ Course | Credits | Marks | | Total |
|--------|--|------------------|-----------|------------|------------|------------|
| | | | | Internal | External | |
| CMLT | Human Anatomy, Physiology and Immunology / 17ZOCT1 | 150 | 10 | 40 | 60 | 100 |
| | General Laboratory Principles, Basic Heamatology, Biochemistry, Microbiology and Pathology 17ZOCT2 | 150 | 10 | 40 | 60 | 100 |
| | Laboratory Principles, Basic Heamatology, Biochemistry, Microbiology and Pathology- Practicals / 17ZOCT3 P | 150 | 10 | 40 | 60 | 100 |
| | | 450 | 30 | 120 | 180 | 300 |
| DMLT | Clinical Haemtology and Biochemistry 17ZODM1 | 150 | 10 | 40 | 60 | 100 |
| | Clinical Microbiology and Pathology 17ZODM2 | 150 | 10 | 40 | 60 | 100 |
| | Clinical Haemtology, Biochemistry Microbiology and Pathology- Practicals 17ZODM3 P | 150 | 10 | 40 | 60 | 100 |
| | | 450 | 30 | 120 | 180 | 300 |
| ADMLT | Communicable and Non-Communicable Diseases /17ZOAD1 | 150 | 10 | 40 | 60 | 100 |
| | Health Care and Advanced Techniques 17ZOAD2 | 150 | 10 | 40 | 60 | 100 |
| | Total | 300 | 20 | 80 | 120 | 200 |

CERTIFICATE PROGRAMME: CMLT

CORE- I
HUMAN ANATOMY, PHYSIOLOGY AND IMMUNOLOGY

Course Code: 17ZOCT1
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective:

To promote an integrated approach to the study of various organs with their functions and Immune systems in man.

UNIT I **30 hours**

HISTOLOGY: Cell, tissue, organs and organ system - Skeletal system - Osteology

GASTROINTESTINAL SYSTEM: Alimentary canal and its various glands - Function of liver and liver function tests

UNIT II **30 hours**

RESPIRATORY SYSTEM: Trachea, lungs including other air passages - Functional anatomy of respiratory system, mechanism of breathing and exchange of gases in the lungs.

MUSCULAR SYSTEM: Structure - Types of muscles in human body - Important muscles and their group action - Innervation of muscles.

UNIT III **30 hours**

IMMUNE SYSTEM: Types of immunity - Innate immunity and its type - Factors involved in innate immunity - Acquired immunity – Active and passive – Antigen – Antibodies - Immune Response - Pregnancy test – ELISA - Auto immune diseases.

UNIT IV **30 hours**

LYMPHATIC SYSTEM: Lymph vessels, lymph nodes and lymphoid organs - Their structure and functions.

EXCRETORY SYSTEM: Structure and function of kidney, ureter, urinary bladder, skin and its derivatives.

SPECIAL ORGANS: Eye, ear, nose, taste buds and subcutaneous organs – Physiology of vision, hearing test and olfaction.

UNIT V **30 hours**

NERVOUS SYSTEM: Central, peripheral nervous system - Neuron and its function - Autonomic nervous system

ENDOCRINE SYSTEM: Hormones - Pituitary, thyroid, parathyroid, adrenal glands and gonads.

Text book:

1. Medical Laboratory Technology, Procedure manual for routine diagnostic tests by Kani L Mukherjee and Swarajit Ghosh. 2nd Edition (Volume I - III) Mc Graw Hill Pub.(2010).

Books for Reference:

1. Manual for Medical Laboratory Technology by S. Raja, Anjana book house Chennai.
2. Text Book of Preventive and Social Medicine by K. Park, M/s Banarsidas Bhanot (Publishers), 1167, Prem Nagar, Jabalpur – 482001, India, 2009.
3. Text Book of Pathology by C.K. Shiha and Kr. Pankaj, Vijay Bhagat, Scientific Book Company, Ashok Rajpath, Patna – 800004, 2005.
4. Text Book of Anatomy, Physiology and Health Education by N. Kumar, A.I.T.B.S. Publishers, J- 5/6, Krishan Nagar, Delhi – 110 051, India, 2009.

CORE - II
**GENERAL LABORATORY PRINCIPLES, BASIC HAEMATOLOGY,
BIOCHEMISTRY, MICROBIOLOGY AND PATHOLOGY**

Course Code: 17ZOCT2
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective:

To understand the application of laboratory and diagnostic medical instruments and to study different parameters of Human Blood.

UNIT I
hours

30

LABORATORY TECHNOLOGY: Introduction and scope - Rules and regulations followed in Lab – maintenance of Records, samples and their collecting methods – Role of Anticoagulants and its types - Basic Instrumentation – pH meter, Autoclave, Incubator, Calorimeter – principles and working methodology.

UNIT II

30 hours

PHYSIOLOGY OF DIGESTION: Absorption and metabolism - Properties and functions of Carbohydrates, Proteins, Lipids and Minerals – Enzymes – Nucleic acids -
DEPROTEINISATION OF BLOOD ESTIMATIONS: Sugar, CTT, Urea, Cholesterol - Triglycerides, Uric acid, A/G ratio, Phosphorous.

UNIT III

30 hours

LABORATORY BIO SAFETY PROCEDURES: First Aid - Handling of infectious materials - Classification and Morphology of bacteria - Disinfection and sterilization - Culture media and their preparation - Culture techniques - Culture characteristics - Isolation of pure culture and maintenance of stock culture.

UNIT IV

30 hours

Blood: Collection of blood (Venous and Capillary) Preservation of blood – Importance of blood bank, anticoagulants used in blood bank - ABO Blood grouping Rh typing - Blood transfusion.

UNIT V

30 hours

COMPONENTS OF BLOOD: Total RBC count – Total leucocytes count - Differential count – Haemoglobin estimation, ESR, PCV - Bleeding and clotting time - Platelet count - Coagulation of blood - Importance of blood clotting - Factors involved in blood clotting.

Text book:

1. Medical Laboratory Technology, Procedure manual for routine diagnostic tests by Kani L Mukherjee and Swarajit Ghosh. 2nd Edition (Volume I - III) Mc Graw Hill Pub.(2010).

Books for Reference:

1. Text Book of Practical Medical Lab Technology by Z. Navatha Rao, Rushi bookhouse, Vijayavada.
2. Text Book of Practical Medical Laboratory Technology by C.R. Maiti, New Central book agency (P) Ltd, Kolkata.
3. Manual for Medical Laboratory Technology by S. Raja, Anjana book house Chennai.
4. Text Book of Preventive and Social Medicine by K. Park, M/s Banarsidas Bhanot (Publishers), 1167, Prem Nagar, Jabalpur – 482001, India, 2009.

CORE – III

LABORATORY PRINCIPLES, BASIC HAEMATOLOGY, PATHOLOGY, BIOCHEMISTRY, MICROBIOLOGY AND PATHOLOGY – PRACTICAL

Course Code: 17ZOCT3P
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective

To develop skill in handling clinical laboratory equipments; and to obtain a holistic knowledge on pathology, biochemistry, microbiology and haematology parameters.

Experiments

1. Identification of RBC, WBC and platelets
2. Hb estimation
3. RBC total count
4. WBC total count
5. WBC differential count
6. ESR estimation
7. PCV estimation
8. Clotting time
9. Bleeding time
10. Hanging drop preparation
11. Inoculation and culture techniques
12. Bacterial colony counting
13. Mantoux test
14. Isolation and identification of pathogenic microbes from wounds, pus, faeces, Sputum and urine.

CERTIFICATE PROGRAMME: DMLT

**CORE - I
CLINICAL HAEMATOLOGY AND BIOCHEMISTRY**

Course Code: 17ZODM1
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective:

To learn the basic concepts of clinical haematology and chemistry of bio molecules.

UNIT I 30 hours

FUNCTIONS TESTS: Liver function test - Renal function test - Thyroid, pancreas gastric analysis (FTM)

SPECIAL TESTS: Lipid profile – TGL, HDL, LDL, VLDL.

UNIT II 30 hours

URINE: Collection, preservation, routine examinations – Protein – Glucose – Acetone – Bile salts – Bile pigments – Urobilin – Urobilinogen – Microscopical examination of urine **FAECES:** Microscopical examination – Intestinal parasites – Helminthes, nematodes, cestodes, trematodes and protozoa.

UNIT III 30 hours

CEREBROSPINAL FLUID: Composition – CSF cells total and differential count - Estimation of protein, Sugars and chlorides

SEMEN ANALYSIS: Collection of semen – Microscopic examination – smear, sperm motility and count.

UNIT IV 30 hours

SPUTUM: Collection – Microscopical and naked eye inspection – Clinical examination. Examination of sputum – Examination of body fluids.

UNIT V 30 hours

HISTOPATHOLOGY: Introduction – Fixatives - Microtechnique – Tissue processing, Fixation – Dehydration – Embedding , sectioning, staining and mounting - Cancer staining - Pap's stain - Biopsy.

Text book:

1. Medical Laboratory Technology, Procedure manual for routine diagnostic tests by Kani L Mukherjee and Swarajit Ghosh. 2nd Edition (Volume I - III) Mc Graw Hill Pub.(2010).

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1. Text Book of Practical Medical Lab Technology by Z. Navatha Rao, Rushi bookhouse, Vijayavada.
2. Text Book of Practical Medical Laboratory Technology by C.R. Maiti, New Central book agency (P) Ltd, Kolkata.
3. Text Book of Pathology by C.K. Shiha and Kr. Pankaj, Vijay Bhagat, Scientific Book Company, Ashok Rajpath, Patna – 800004, 2005.
4. Text Book of Anatomy, Physiology and Health Education by N. Kumar, A.I.T.B.S. Publishers, J- 5/6, Krishan Nagar, Delhi – 110 051, India, 2009.

CORE - II
CLINICAL MICROBIOLOGY AND PATHOLOGY

Course Code: 17ZODM2
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective:

To confirm hygienic methods of living and to learn about the diseases causing microbial agents.

UNIT- I **30 hours**

STAINING AND STAINING PROCEDURE: Types, Gram staining - Acid fast staining -Antimicrobial agents, drug resistance, drug sensitivity test - Bacteriology of water, milk and food.

UNIT- II **30 hours**

INVASION OF PATHOGENS: Symptoms - Diseases and Diagnosis in Human - Common cold, Cholera, Typhoid, Malaria, Elephantiasis, Jaundice, Flu, Measles, Hepatitis B.

UNIT- III **30 hours**

SEXUALLY TRANSMITTED DISEASES: HIV, Syphilis, Gonorrhoea, Chancroid or Soft sore, Donovanosis, Genital candidiasis - Antibiotic sensitivity test - Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC).

UNIT- IV **30 hours**

VIROLOGY: Introduction – Morphology - General properties - Common viral diseases - Viral vaccines and antisera.

MYCOLOGY: General properties - Mycotoxins - Common fungal diseases

UNIT- V **30 hours**

PARASITOLOGY: Diagnostic parasitological techniques - Entamoeba - Trypanosoma - Plasmodium - Ascaris - Tape worm - Schistosoma - Wuchereria.

Text book:

1. Medical Laboratory Technology, Procedure manual for routine diagnostic tests by Kani L Mukherjee and Swarajit Ghosh. 2nd Edition (Volume I - III) Mc Graw Hill Pub.(2010).

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2. Manual for Medical Laboratory Technology by S. Raja, Anjana book house Chennai.
3. Text Book of Preventive and Social Medicine by K. Park, M/s Banarsidas Bhanot (Publishers), 1167, Prem Nagar, Jabalpur – 482001, India, 2009.
4. Text Book of Pathology by C.K. Shiha and Kr. Pankaj, Vijay Bhagat, Scientific Book Company, Ashok Rajpath, Patna – 800004, 2005.
5. Text Book of Anatomy, Physiology and Health Education by N. Kumar, A.I.T.B.S. Publishers, J- 5/6, Krishan Nagar, Delhi – 110 051, India, 2009.

CORE - III
CLINICAL HAEMATOLOGY, BIOCHEMISTRY, MICROBIOLOGY AND
PATHOLOGY PRACTICALS

Course Code: 17ZODM3P
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective:

To obtain operational knowledge on basic laboratory instrumentation and to develop skill on biochemical estimation procedures.

Experiments

1. INSTRUMENTS: Incubator, centrifuge, autoanalyser, Sphygmomanometer, Electrophoresis, Light microscope, Weighing balance, Haemocytometer – Albuminometer – Urinometer – Sahlis haemoglobinometer.
2. Estimation of blood sugar
3. Glucose tolerance test
4. Estimation of urea in blood
5. Estimation of serum cholesterol
6. Estimation of serum creatinine
7. Estimation of albumin in serum
8. Estimation of Total protein in serum
9. Estimation of serum acid phosphatase
10. Estimation of serum amylase
11. Urine analysis (normal constituents)
12. Urine analysis (abnormal constituents)
13. Urea clearance test
14. Estimation of bilirubin
15. Sperm motility and sperm count
16. Haemagglutination-Demonstration
17. Examination of stool

18. Examination of sputum
19. Examination of Body fluids
20. Pregnancy test
21. Serum analysis-sugar, cholesterol, SGOT, SGPT, triglycerides, bilirubin, creatinine, urea, uric acid, total protein, albumin and globulin estimation.
22. Urine analysis-pH, sugar ketone bodies, albumin, bile and bile salts, bile pigments, sulpha drugs, occult blood, urobilinogen and sugars.
23. Microscopical examination of urine-cells, cast, crystals, Alkaline, urine, miscellaneous objects.
24. Preparation of Histopathological specimens.
25. Testing sensitivity of bacteria to antibiotics.
26. Assessing minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) to antibiotics.
27. Microbiology-streak plate method, simple staining, Gram staining, Acid fast Bacilli staining of fungi, flagella and capsula-Motility test-biochemical, indole, unheated serum test, widal test and formal gel test.
28. Serology-VDRL Slide flocculation test and Widal test.

EXAMINATION OF PREPARED PARASITOLOGICAL SLIDES

COP – ADVANCED DIPLOMA IN MEDICAL LAB TECHNOLOGY

CORE – I

COMMUNICABLE AND NON - COMMUNICABLE DISEASES

Course Code: 17ZOAD1
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective

To promote basic knowledge on the epidemiology and prevention of infectious and non infectious diseases.

EPIDEMIOLOGY OF COMMUNICABLE DISEASES:

UNIT- I 30 hours

Respiratory infections: Small pox – Chicken pox – Measles – Rubella – Mumps – Influenza – Diphtheria - Whooping cough – Meningitis – SARS – TB.

UNIT- II 30 hours

Intestinal Infections: Poliomyelitis – Hepatitis – Diarrheal diseases – Cholera – Typhoid – Food poisoning – Amoebiasis – Ascariasis – Hookworm infection – Dengue – Malaria – Filariasis.

UNIT- III 30 hours

Zoonoses: Viral Zoonoses: Rabies – Yellow fever – Japanese encephalitis – Bacterial & Rick zoonoses; Chikungunya; Leptospirosis – Plaque – Typhus. Parasitic Zoonoses: Taeniasis – Leishmaniasis.

Surface Infections: Tetanus – Leprosy – STD – AIDS – Hospital Acquired Infection.

EPIDEMIOLOGY OF NON- COMMUNICABLE DISEASES:

UNIT- IV 30 hours

Problems, Risk factors and prevention of Cardiovascular diseases: Coronary Heart Diseases; Hypertension – Stroke – Rheumatic Heart diseases.

UNIT - V 30 hours

Problem, Risk factors and prevention of Cancer: Diabetes – Obesity – Blindness - Accidents and Injuries.

Text book

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5. Text Book of Pathology by C.K. Shiha and Kr. Pankaj, Vijay Bhagat, Scientific Book Company, Ashok Rajpath, Patna – 800004, 2005.

CORE – II
HEALTH CARE AND ADVANCED TECHNIQUES

Course Code: 17ZOAD2
Hours/Week : 150
Credit : 10

Max Marks : 100
Internal Marks : 40
External Marks : 60

Objective

To provide an understanding of human healthcare and to develop basic knowledge in paramedical sciences

UNIT - I

30 hours

Concepts of health and well being – Quality of life index – Nutrition and health – Food hygiene – Rural health and Sanitation – Population explosion in India – Birth control measures.

UNIT - II

30 hours

Environment and health – Water, Health and Water borne diseases – Air, Health and Air borne diseases – Standards of housing – Ventilation – Human requirements and Standards.

UNIT- III

30 hours

Solid wastes and Health hazards – Safe disposal of water and health – Hospital waste management - Sanitary health measures.

UNIT -IV

30 hours

Health situation in India – Health problems – Primary health care in India – PHC – National health programmes in India – Health care system.

UNIT V

30 hours

Techniques in paramedical sciences – National Health programmes – National nutrition programmes - Basic minimum services programme – International Health Organizations: WHO – UNICEF etc.,

Text book

1. Medical Laboratory Technology, Procedure manual for routine diagnostic tests by Kani L Mukherjee and Swarajit Ghosh. 2nd Edition (Volume I - III) Mc Graw Hill Pub.(2010).

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4. Text Book of Pathology by C.K. Shiha and Kr. Pankaj, Vijay Bhagat, Scientific Book Company, Ashok Rajpath, Patna – 800004, 2005.
5. Text Book of Anatomy, Physiology and Health Education by N. Kumar, A.I.T.B.S. Publishers, J- 5/6, Krishan Nagar, Delhi – 110 051, India, 2009.