

# OPJS UNIVERSITY, CHURU (RAJASTHAN)



## SYLLABUS

FOR

## DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

(DMLT)

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SCHOOL OF PARA MEDICAL SCIENCE  
OPJS UNIVERSITY, CHURU (RAJASTHAN)  
2013-14

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# **DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY**

## **SYLLABUS**

Duration of course – 2 year (4 Semester)

### **SEMESTER –I**

<b>S.No.</b>	<b>PAPER CODE</b>	<b>NAME OF PAPER</b>	<b>M.M.(T-S-P)</b>
1.	DMLT-11	ANATOMY& PHYSIOLOGY	70+30+50
2.	DMLT-12	GENERAL MICROBIOLOGY	70+30+50
3.	DMLT-13	HEMATOLOGY	70+30+50
4.	DMLT-14	GENERAL BIOCHEMESTRY	70+30+50

### **SEMESTER –II**

<b>S.No.</b>	<b>PAPER CODE</b>	<b>NAME OF PAPER</b>	<b>M.M.(T-S-P)</b>
1.	DMLT-21	GENERAL MYCOLOGY VIROLOGY	70+30+50
2.	DMLT-22	GENERAL SEROLOGY & IMMUNOLOGY	70+30+50
3.	DMLT-23	GENERAL PARACITOLOGY	70+30+50
4.	DMLT-24	BASIC BLOOD BANK TECHNIQUE	70+30+50

### **SEMESTER –III**

<b>S.No.</b>	<b>PAPER CODE</b>	<b>NAME OF PAPER</b>	<b>M.M.(T-S-P)</b>
1.	DMLT-31	CLINICAL TRANSFUSION MEDICINE	70+30+50
2.	DMLT-32	CLINICAL MYCOLOGY & VIROLOGY	70+30+50
3.	DMLT-33	HISTOTECHNOLOGY	70+30+50
4.	DMLT-34	ADVANCE TECHNIQUE & INSTRUMENT	70+30+50

### **SEMESTER –IV**

<b>S.No.</b>	<b>PAPER CODE</b>	<b>NAME OF PAPER</b>	<b>M.M.(T-S-P)</b>
1.	DMLT-41	CLINICAL PATHOLOGY	70+30+50
2.	DMLT-42	CLINICAL BIOCHEMISTRY	70+30+50
3.	DMLT-43	CLINICAL MICROBIOLOGY	70+30+50
4.	DMLT-44	BIO-CHEMICAL TEST	70+30+50

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# **Details of Syllabus**

## **SEMESTER –I**

### **ANATOMY**

#### **DIVISION OF ANATOMY**

- Cadaveric anatomy , living anatomy , embryology & development anatomy, histology (microscopic anatomy) surface anatomy , radiographic and imaging anatomy.

#### **TERMS USED IN CLINICAL ANATOMY**

- Various suffix & terminology related to human body.

#### **LYPHATIC SYSTEM OF HUMAN BODY**

- Component of lymphatic system – lymph vessels, Central lymphoid tissue, peripheral lymphoid organs circulation lymphoid system in human body.

#### **SKIN & FASCIAE**

- Structure of skin
- Superficial fasciae , deep fasciae , clinical anatomy

#### **UPPER LIMB**

- Bones of upper limb , major arteries and vein , site of collection in upper limb , surface marking upper limb

#### **THORAX**

Bone of thoracic cage, lung & heart.

#### **HEAD NECK & BRAIN**

- Main artery around neck, anatomy of circle of Willis, dilated vein around neck

#### **ABDOMEN**

- Visceral organ in abdomen , site for lumbar puncture.

#### **LOWER LIMB**

- Bones of Lower limb, arteries & vein of lower limb, site of collection in lower limb.
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### **PHYSIOLOGY**

#### **RESPIRATORY SYSTEM:-**

Physiology of breathing , gaseous exchange, respiration, transport of respiratory gases, Lung volume & capacities, Pulmonary function test.

#### **CARDIOVASCULAR SYSTEM:-**

Blood pressure and physiology of heart, cardiac cycle cardiac output , ECG.

#### **DIAGESTIVE SYSTEM:-**

Digestive enzyme & gland, digestion of carbohydrate, protein & fat , vitamin

#### **CIRCULATORY SYSTEM:-**

RBC, WBC, Platelets, blood components, plasma, blood composition & content collected from various site.

#### **ENDOCRINE SYSTEM:-**

Different hormone, their site of production, mech. of action, function, deficiency syndrome

### **EXCRETORY SYSTEM:-**

Excretory function by kidney, liver, formation of urine

### **REPRODUCTIVE SYSTEM:-**

Male & female genital system , function of ovary, function of testis &hormone, testosterone, progesterone Estrogen hormone menstruation cycle & fertilization.

### **SKIN:-**

Layers of skin, function of skin

### **CENTRAL NERVOUS SYSTEM:-**

CSF, Function of Brain, special senses- smell, taste, touch, hearing.

## **GENERAL MICROBIOLOGY**

### **INTRODUCTION OF MICROBIOLOGY**

- Definition , type of micro Organism , virus, Bacteria , fungi

### **CULTURE MEDIA**

- Type of culture media , composition of culture media, classification of culture media.

### **CULTURE METHOD**

- Virus culture method, clinical application of culture method, bacteria growth curve.

### **MORPHOLOGY OF BACTERIA**

- Morphology of bacteria , structure and growth of bacteria , classification of bacteria, nutrition of bacteria.

### **STAINING OF BACTERIA**

- Gram stain, I-n Stain , negative stain , Albert stain, spore stain , composition & preparation of staining, reagents and their composition .

### **GRAM NEGATIVE COCCI**

- Gonococci & meningococcal .

### **GRAM POSITIVE COCCI**

- Streptococci, staphylococci, Pneumococci.

### **GRAM BACILLI**

- Salmonella, pseudomonas, shigella, klebsiella, haemophilus E-coli other gram bacilli .

### **GRAM POSITIVE BACILLI**

- Anaerobic bacilli – clostridia
- Aerobic – mycobacterium tuberculosis and mycobacterium leprae and corynebacterium diphtheria

### **WATER**

- Composition and contamination of water.
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## **HEMATOLOGY**

### **HEMATOLOGY**

Hematology is the study of blood which includes the blood cell and fluid(plasma) surrounding them.

### **BLOOD**

- The blood cell.
- Erythrocytes (RBC) it's function, concentration , appearance
- Leukocyte (WBC) it's function, concentration , appearance
- Thrombocytes(Platelets) it's function, concentration , appearance

## PERIPHERAL BLOOD EXAMINATION

- Collection of blood , Anticoagulant .

## DETERMINATION OF HEAMOGLOBIN

- Clinical significance
- Sahli's (Acid Haematin), method , cyanohemoglobin method .
- Total red blood cell count (TRBC)
- Total leucocytes count (TLC)
- Study of blood cell smear for differential leucocytes count and cell morphology
- Differential leucocytes count (DLC)
- Determination of packed cell volume (PCV) by Micro-haematocrit method
- Determination of platelet count
- Erythrocyte sedimentation rate (ESR)
- Determination of absolute eosinophil count
- Reticulocyte count.
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## BIO-CHEMISTRY

### BIO-CHEMISTRY

As per matter of fast material biochemistry deals with molecules of living cell and their chemical reaction.

### Introduction of Bio-chemistry

### Defination, classification and importance metabolism in brief following:-

- Protein
- Carbohydrate
- Lipids

### Analysis and collection of gastric juice

### Estimation of :-

- Total protein
- Serum albumin
- Globulin & A.G. Ratio
- Serum Creatinine
- Blood sugar (GOD-POD)

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## SEMESTER -II

## GENERAL MYCOLOGY & VIROLOGY

### MYCOLOGY

"It is a branch of medical science dealing with study of fungi".

1. General characteristics life cycle , diagrams & pathology, investigation of various fungi.
2. KOH test
3. Trichophyton

### MYCOLOGY

"It is a branch of medical science dealing with study of virus".

1. General features, lab diagnosis, isolation, inoculation
2. Multiplication of virus, virus culture media.

# GENERAL SEROLOGY & IMMUNOLOGY

## SEROLOGY

“is study of immunological aspect”

## IMMUNOLOGY

“The study of the molecular and cellular biology of antigen and of immune reaction”

- Immunity
- Antigen
- Immunogen
- Antibody
- Immunoglobulin
- Mechanism of acquired reaction
- Autoimmune disease
- Immunization
- Vacancies
- VDRL

# GENERAL PARASITOLOGY

## PARASITOLOGY

“It is a branch of medical science dealing with study of various human Parasites”.

- Describe morphology life cycle symptoms, Clinical diagnosis laboratory diagnosis.
- Explain –Round Worm , type worm, hook worm, pin worm, giardia (lamblia) , E. histolytic, Plasmodia, Leishmania, trichomonas.

# BASIC BLOOD BANK LABORATORY

## BLOOD BANK LABORATORY

- **Blood bank laboratory**- collection of blood samples, storage of blood, screening of donor.
- **Blood group system** – ABO grouping by slides and tube method , one/two stage albumin technique for RH factor , antigen and antibodies.
- **RH System** – slide method
- **Common test** - (direct method & in direct method )
- **Cross matching** – open slide method, albumin tube technique

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## SEMESTER –III

# CLINICAL MYCOLOGY & VIROLOGY

1. Describe

- Small Pox
- Chicken pox
- Measles
- Hepatitis
- Poliomyelitis
- Rabies
- AIDS
- Mumps, herpes, simplex, & herpes Zoster

## BLOOD BANK AND TRANSFUSION MEDICINE

**“It Pathology is the studies of disease process with the aim of understand their nature and causes”**

- **Blood bank**- general policies for blood bank & transfusion services, the donor medical history donor, physical examination of donor , screening of blood donor segment for the blood unit.
- **Exchange and other transfusion consideration** – simple transfusion, exchange transfusion, selection of blood for exchange transfusion.
- **Preservation and storage of blood** – blood storage, advantage & disadvantage of frozen red cell, compatibility establishing technology.

## HISTOTECHNOLOGY

1. Introduction , examination method of cell & tissue.
2. **Tissue processing** – collection of specimen , fixation , labeling & clearing , and dehydration
3. **Fixation of tissue** – simple fixative & cytological fixative , micro anatomical fixative
4. Staining of tissue section , theory of staining techniques.
5. **Section cutting** – micro tomes and their knives, mounting of section , techniques of section cutting.

## ADVANCE TECHNIQUE & INSTRUMENT

- Microscope – principle, operation care and use of microscope.
- Semiautoanalyzer - Pipeting, reagent, clining, rule of operative
- Urinometer – color , PH, apperience , sugar, protien
- Sterilization – general principle of sterilization, classification, physical mechanical 7 chemical method, sterilization of media, syringes glassware & apparatus.
- Role of laboratory in the heath.
- Duties and responsibilities of lab technician – general duties , specific duties.
- First aid & safety measures – aims type & diagnosis of first aid.
- Hemometer - HB,RBCs, WBC, Platelet.
- Electrometer – Na<sup>+</sup>, K<sup>+</sup>, Cl<sup>-</sup> , Ca<sup>++</sup> Mg.

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# SEMESTER –IV

## CLINICAL PATHOLOGY

“It Pathology is the studies of disease process with the aim of understand their nature and causes”

- **Bone marrow smears** – signification & indication preparation & staining of bone marrow , cell distribution and abnormalities in viruses diseases.
- **Leukemia and myelodysplastic syndromes (MDS)** – Defination , classification leukeamoid reaction.
- **Diagnostic signification of peripheral blood smear abnormalities** - Erythrocytes, leucocytes and platelet , parasites of blood .
- **Hemorrhagic disorder** – homeostasis in cases of hemorrhagic disorder.

## CLINICAL BIO-CHEMISTRY

### **Hormones:-**

- Defination of hormones
- Function of important hormones
- T3.T4,TS H

### **Bilirubin**

### **Serum amylase**

### **Serum electrolytes :-**

- Normal blood value Na+
- Normal blood value Cl+
- Normal blood value K+
- Normal blood value Mg+
- Importance of Na+, Cl-, K+

### **Glucose tolerance test (G.T.T.)**

- Type & Classification
- SGOT,SGPT
- Bilirubin Estimation (direct& indirect)
- Estimation of acid phosphate & alkaline Phosphates
- Jaundice classification

### **Urine Analysis**

- Norma & Abnormal constituents of urine
- Physical & chemical test of urine
- Proteins in urine
- Occult blood in urine
- Urinary sediments



# CLINICAL MICROBIOLOGY

## **Specimens For Microbiological Investigation**

- a) Examination of pus, abscess and wounds
- b) Milk

## **Bio-chemical test**

- Test of metabolism of protein, amino acid, production of enzymes
- VP test, MRI test, catalast test
- Gram stain , negative stain, ziehl-neelsen, Albert stain.
- Preparation examination of mink and water.

# ADVANCE SEROLOGY & IMMUNOLOGY

## **SEROLOGY**

“is study of immunological aspect”

## **IMMUNOLOGY**

“The study of the molecular and cellular biology of antigen and of immune reaction”

- Widal, Elisa for HIV I& II, Kaolin test, anti nuclear antibody, anti thyroid antibody, australia antigen, immune florescent method, Alfa fat, protein, AFP, Carcinoembryonic antigen (CEA), RF (Rheumatoid factor) Antistreptolysin titer (ASO) , HCG Estimation, vaccination, active and passive immunity, disease transmitted by blood transfusion.

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