


SCHEME OF EXAMINATION & SYLLABUS  
OF  
**Diploma in Medical Lab Technician (DMLT)**  
2 Years Diploma Course  
(Academic Session 2021-22)

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Institute of Paramedical Science and Research,  
Jiwaji University, Gwalior (M.P.)-India

  
Coordinator  
Institute of Paramedical Sciences  
and Research

## REGULATIONS FOR DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

### 1. The objective of the course-

Diploma in the **Medical Lab Technician (MLT)** course prepares students for rewarding in-demand career opportunities. The course deals with prognosis, diagnosis, and follow-up through the use of clinical laboratory tests. This professionally woven and well-integrated course provides an exhaustive learning experience and aims towards a basic understanding of varied aspects of lab and diagnostic techniques. During the medical laboratory technician course, students learn different test procedures to diagnose and detect diseases. The curriculum deals with collection of patient information, sampling, reporting, testing and documentation.

The **lab technician course** covers elements of blood bank management, materials management, supply chain management as well as lab information system management.

Students are also taught how to clean and maintain the lab equipment along with proper management of biomedical waste.

- This course is aimed to carry out all routine diagnostic /therapeutic test on private / government hospitals, nursing homes, health clinics / research labs
- The basis for the course is practical training, supplemented by series of lecture, demonstrations on the theoretical aspects of various subjects. The students work by rotation in batches in the discipline of clinical biochemistry, microbiology, histopathology and hematology. They receive hands-on training to work as full-fledged lab technologists at hospitals.

### 2. Duration:

The Diploma course is of two years.

### 3. Eligibility for admission in Para medical Diploma course

- The candidate must have passed 10+2 with at least 40% marks in aggregate of Physics Chemistry and Biology (P C B ) and for DMLT 10 + 2 ( P C B ) or 10 + 2 vocational (MLT ) course with at least 40% marks will also be eligible.
- In case of SC/ST/OBC candidates, 5% marks relaxation will be given for the admission in above said courses (MP Domicile)
- Weightage will be given as per university rules.

### 4. Age limit for admission

The minimum age for admission shall be 17 years on 31 December of the

Academic year of admission.

**5. Admission –**

- The selection of candidate will be on the basis of the entrance examination or in the absence of entrance exam, purely on merit list prepared on the basis of marks obtained in qualifying examination.
- The admissions of students into various programs should be completed by 30th November. There shall be minimum 240 teaching days in one academic year.

**6. Attendance of students:**

The student should have 75% attendance in theory and 75% attendance in practical to be eligible to appear in university examination. However, only Dean/ Principal of the college are empowered to condone 10% of attendance on valid grounds. Monthly attendance of students has to be sent to the university every month from the respective affiliated colleges. (\*MPMSU)

**7. Total Course Duration:**

A student has to complete the course that he/she has joined with in the double the duration of the actual time taken for the completion of the course i.e. - Four Years for all Diploma Courses.

**8. Medium of instruction and examination:**

In case of diploma courses the medium of instruction will be bilingual (English or Hindi) and the medium of examination will be either English or Hindi as per the convenience of the student.

- There will be two University Examinations in one academic session.
- For all the Diploma courses (which is of two years duration) at the end of first year, an Internal examination will be conducted at the college level itself and the result has to be sent to the University as per the scheduled notification. (These marks will be included in the Final Transcripts), and the students are eligible to appear their final year examination at MPMSU, subject to passing in first year internal examination conducted at college level. University examination will be held at the end of Two years only.



### 9. Passing Marks of Examination:

- The passing marks of examination would be 50% for each subject and also in total marks obtained for both Diploma and Degree courses. The candidate has to pass in theory and practical examination separately. For theory paper the internal assessment marks, viva-voce and theory examination marks will be counted.
- The candidate should pass separately in two heads i.e In Theory (Theory plus Viva voce plus Internal Assessment) and also in Practical (with 50% marks).
- The candidate has to pass separately in each subject in internal assessment examination (with 50% marks) in order to be eligible to appear in university examinations.
- Regarding Grace Marks it was decided that total weightage of grace marks would be 5 (five), and that grace marks can be split between the subjects. There will not be any grace marks for the Practical examination.
- Grace marks will not be added to total marks of the candidate. In Supplementary examination also similar pattern of grace marks will be followed.
- Re-totalling & Re-valuation (Review) both should be allowed as per the university rules
- Other rules regarding conduct of examination will be as per the university REGULATION/notifications

**Note: FOR OTHER PROVISION WHICH ARE NOT COVERED IN THIS CURRICULUM & SYLLABUS WILL BE APPLICABLE AS PER THE UNIVERSITY REGULATION.**

  
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**SCHEME OF EXAMINATION:**  
**Diploma in Medical Lab Technician (DMLT)**  
**FIRST YEAR D.M.L.T. EXAMINATION**

| Course code | Subject  | Theory | Internal assessment | Practical | Total       |
|-------------|--|--------|---------------------|-----------|-------------|
| MDTN 110    | Human Anatomy & Physiology-I                                   | 100    | 100                 | 100       | 300         |
| MDTN 120    | Biochemistry   | 100    | 100                 | 100       | 300         |
| MDTN 130    | Pathology -I : Haematology, Blood Banking & Clinical Pathology | 100    | 100                 | 100       | 300         |
| MDTN 140    | Pathology-II : Microbiology, Virology, Parasitology & Serology | 100    | 100                 | 100       | 300         |
|             | <b>TOTAL</b>   |        |                     |           | <b>1200</b> |

(There shall be Institutional level theory examination as per university notification, marks to be send to University for internal assessment purposes of university examination)

**SCHEME OF EXAMINATION:  
Diploma in Medical Lab Technician (DMLT)  
SECOND YEAR D.M.L.T. EXAMINATION**

| Paper Code.  | Subjects   | Theory     | Internal Assessment | Practical  | Total       |
|--------------|--|------------|---------------------|------------|-------------|
| MDTN 210     | Human Anatomy & Physiology                                     | 100        | 100                 | 100        | 300         |
| MDTN 220     | Biochemistry   | 100        | 100                 | 100        | 300         |
| MDTN 230     | Pathology -I : Haematology, Blood Banking & Clinical Pathology | 100        | 100                 | 100        | 300         |
| MDTN 240     | Pathology-II : Microbiology, Virology, Parasitology & Serology | 100        | 100                 | 100        | 300         |
| <b>Total</b> |  | <b>800</b> |                     | <b>400</b> | <b>1200</b> |

N.B. - There shall be university examination at the end of 2<sup>nd</sup> year curriculum of Diploma in Medical Lab Technician (DMLT)

1. First year institutional /college level theory examination's awarded marks would be consider as Internal assessment marks and candidate have to get min. 50% marks in university theory examination in addition to Internal assessment marks i.e. 100 marks collectively for passing the examination.
2. University Practical examination of 100 max. marks is inclusive of viva and candidate should get separate 50% marks i.e. 50 marks to get pass

  
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### Pattern of Examination (Theory)

- All theory papers will of 100 max. Marks and 3 Hrs. time duration.
- Pattern of Examination(Theory) if Maximum Marks are 100 will be as under;-

3.

| No. and Type of Questions  | Marks for each Question | Total Marks |
|--|-------------------------|-------------|
| 10 very short answer Questions<br><i>Answer to be given in 50-60 words</i> | 02                      | 20          |
| 5 short answer Questions<br><i>Answer to be given in 250-300words</i>      | 10                      | 50          |
| 2 essay type Questions<br><i>Answer to be given in 450-500words</i>        | 15                      | 30          |
| Total Marks  |                         | 100         |

#### Instruction for the Paper Setter

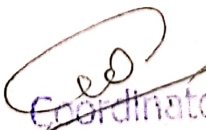
**Section-A:** This will consist of 10 very short answer type questions with answer to each question up to five lines (Fifty to sixty words) in length . All questions will be compulsory to answer. Each question will carry two marks. Total weightage of the section shall be 20 marks.

**Section-B:** This will consist of short answer questions with answer to each question up to 2 pages (250-300 words) in length. Eight questions will be set by the examiner and five have to be answered by the candidate. Each question will carry 10 marks. Total weightage of the section shall be 50 marks.

**Section-C:** This will consist of essay type questions with answer to each question up to 5 pages (approx. 500 words) in length. Four questions will be set by the examiner and two have to be answered by the candidate. Each question will carry 15 marks. Total weightage of the section shall be 30 marks.

#### Instructions for the Candidates: Answer all questions only in required word.

There will be only 1 single answer sheet containing 40 pages and no additional sheets would be provided to the student.

  
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Part I  
Intro  
I.

**DIPLOMA IN MEDICAL LAB TECHNICIAN (DMLT): 1<sup>ST</sup> YEAR**  
**Syllabus (2021-22)**

**MDTN 110: Human Anatomy & Physiology**

**Total No. of Hrs.-60**

**Outcome of the Course:**

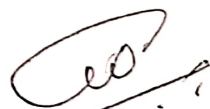
The study of basic anatomy and physiology is essential because it will help in understanding the basic structure of the human body and normal function in health, During disease the normal function may to likely be affected, By various laboratory tests, the student will be able to know the abnormal functioning of the body and ultimately helps in diagnosis of the diseases.

**Part A: Anatomy & Physiology of human body:**

1. Introduction of living system and Human Body; General Anatomy.
2. The anatomic and physiological organization of human body and integrated physiology.
3. Cell structure, organization and function.

**Normal anatomical structure, Histology & Functions (Physiology) of the following systems**

4. Anatomy of skin, types and its function; Applied aspects of skin-Albinism, Skin cancer etc
5. Skeletal system; bones, Joints - Definition, Classification of joints with examples, Synovial joint, Movements & mechanism of Joints, structure and range of movement; muscles.
6. The circulatory system; structure of the Heart & Blood Vessels; major arteries and veins of the body; Body fluids and their significance; Blood morphology, chemistry and function.
7. Lymphatic system: Circulation and function; lymphoid organ Spleen, lymph node and R.E. system.
8. Respiratory system; anatomy & physiology of lungs, mechanism of inspiration and expiration; cardio respiratory adjustment in health and disease.
9. Digestive system: mechanism and physiology of digestion and absorption of nutrients; Liver and pancreas structure and function. Gastrointestinal secretion & regulation; function of saliva, gastric juice, pancreatic juice & bile
10. Urinary system: kidney, ureter, bladder, urethra; regulation of Na, Cl, K excretion
11. Reproductive system – Male & Female; Spermatogenesis, Functions of Testosterone; Ovarian and Menstrual Cycle and their hormonal control
12. Nervous system; neurons, Brain and Spinal cord, structure and function
13. Endocrine System; different glands and their functions



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## Part B: Basic Histology & Histotechnology

### Introduction:

1. Introduction to histopathology and laboratory organization.
2. Laboratory equipment, uses and maintenance.
3. Laboratory hazards and safety precautions.
4. Compound microscope - optical system, magnification and maintenance.

### Fundamentals of applied histology

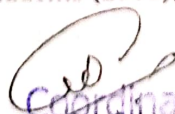
1. Reception, recording and labeling of histology specimens.
2. Fixation and various fixatives.
3. Processing of histological tissues for paraffin bedding. Block making, Section cutting
4. Embedding and embedding media.
5. Decalcification various types.
6. Micro tomes various types, there working principle and maintenance.
7. Microtome knives and knife sharpening.
8. Practical section cutting, cutting faults and remedies.
9. Routine staining procedures, mounting and mounting media.
10. Dye chemistry, theory and practice of staining. Solvents, mordents, accelerators and accentuators.
11. Uses of controls in various staining procedures.

### Cytology lectures:

1. Introduction to exfoliative cytology with special emphasis on female genital tract.
2. Collection processing and staining of the Cytology specimen.
3. FNAC technique

### References

1. Chaurasia B D, Human Anatomy; Latest 3V, Regional and CBS, New Delhi
2. Snell, Richard S Clinical Anatomy for Medical Students; Little- Brown, Boston-L.
3. Tortora G.J. Tortora principles of Anatomy and Physiology with study guide; global edition; CBS, New Delhi
4. Graaff, Kent Van de and et al, Schaum's Outline of Human Anatomy and Physiology: Fourth Ed. , McGraw Hill Education
5. Khurana L, Textbook of anatomy and physiology for paramedical students, CBS, New Delhi
6. Singh B, Human Anatomy And Physiology For Health Science Students (In Hindi)
7. VISHWAKARMA SADHANA; Techniques in Histopathology & Cytopathology A Guide for Medical Laboratory Technology Students (2018); Jaypee Brothers, New Delhi.

  
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M.M.

# PRACTICAL

## Lab-1 Human Anatomy & Physiology

M.M. 100 Marks

### 1) ANATOMY: -


- Demonstration of parts of body and land marks on the surface.
- The skeletal system, Head & Neck. Thorax and Abdomen: -
- Demonstration of various organs within thorax & abdomen.
- Respiratory systems, pleurae, heart, liver, gall bladder, peritoneum stomach & intestine.
- Spleen, pancreas & parts of urinary system
- General nervous system: -
- Spinal level and site of lumbar puncture.
- Surface anatomy of important organs & blood vessels.
- Identification of models like those of Brain, Heart, embryology, Kidney.
- DEMONSTRATION: -
- Fixing, labeling & storage of specimens.
- Drawing diagrams & labeling.
- Demonstration of models, specimens & skeleton.

### 2) PHYSIOLOGY: -

- The microscope, its usage, cleaning & maintenance.
- Identification of blood cells under Microscope. RBC, various types of WBC, platelets, Reticulocytes.
- Preparation of anti-coagulants.
- Collection of blood samples to obtain plasma & serum samples.
- Hemocytometry - Ruling area of the Neubauer's Chamber.
- Hemocytometry - The Diluting Pipettes.
- Usage of RBC & WBC pipettes ( Westergren tube & Wintrobe tube).
- Estimation of Hb,
- Preparation of blood smears, staining.
- Demonstration of blood pressure recording and pulse.
- Determination of bleeding, clotting & prothrombin Time.

**Note:** -All theory topics scheduled followed by practical.

Minimum 100 Hrs. of posting should be in Biochemistry Minimum 100 Hrs. of posting should be in pathology in 1<sup>st</sup> years to get accustomed with pathology Dept.

  
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**Outcome of the Course:**

On completion of this course the students will be able to: 1. Define biochemistry and explain the major complex biomolecules of the cell. 2. Enumerate the chemical structure, classification and functions of proteins, lipids and carbohydrates. 3. Comprehend the classification & function of nucleic acids and enzymes. 4. Explain the biochemical structure of vitamins, its classification and the functions of vitamins and minerals. 5. List the various hormones, its action and function. 6. Describe acids and bases, the mechanism of homeostasis and acid base balance.

**Course Outline:**

1. Introduction to medical technology role of medical laboratory Technologists, ethics, responsibility, safety, measures First aid (accidents).
2. Introduction of inorganic chemistry; Structure of atom, atomic weight, molecular weight and equivalent weight; Acids, bases and salts; pH indicators; pH meter; pH measurement : different methods; Henderson- Hasselbalch equation.
3. Definition and preparation of reagents and solutions; Molar solutions; Normal solutions; Buffer solutions; Percent solution; Saturated solution; Standard solutions;
4. Elementary knowledge of organic chemistry (Organic compounds, aliphatic, aromatic, alcohol, : ethers, phenols, Aldehydes, Ketones, Amines, Esters, acids etc.);
5. Elementary knowledge of Physical Chemistry; Osmosis (dialysis), osmotic pressure, diffusion, hypotonic, hypertonic and isotonic solutions; Definition and classification of some Colloids and crystalloids.
6. Elementary Knowledge of Analytical Chemistry: Principles, Instrumentation, working, uses, care, Maintenance; Balances - mono-pan, two-pan, top-pan; Centrifuges; pH meter; Colorimeter; Spectrophotometer; Fluorimeter; Flame-photometer; Ion selective electrodes; Urinometer; Chromatograph; Electrophoresis; Densitometer.
7. Units of measurement, S.I. Units, measurement of volumetric apparatus, (pipettes, flasks, cylinders) Calibration of volumetric apparatus.
8. Radioisotopes and their use in Biochemistry.
9. Structure Dietary Sources and basic metabolism of the following-
  - a. Carbohydrates-( blood glucose & its importance; glucose tolerance test; glycosylated Hb)
  - b. Proteins- formation of urea, ammonia; formation of non-protein nitrogenous products e.g. uric

  
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- acid, creatinine;
- c. Lipids- lipid profile (cholesterol, triglyceride, lipoproteins, phospholipids) and its significance in various disorders.
  - d. Nucleic acid- DNA and RNA Watson & Crick model of DNA
10. Enzymes: Classification; properties; Clinical enzymology - Therapeutic, diagnostic and analytical uses of enzymes with normal values of serum enzymes;
11. Vitamins, Minerals and Electrolytes: Fat soluble and water soluble vitamins; vitamin deficiency. Calorific value of foods – Basal metabolic rate(BMR) – respiratory quotient(RQ) Specific dynamic action(SDA) – Balanced diet – Marasmus – kwashiorkor
12. Hormones - Chemical nature and biochemical functions.
13. Urine analysis (qualitative) for sugar, proteins bile pigments, ketone bodies, porphyrinogen, faecal occult blood.
14. Collection and recording of biological specimens, separation of serum plasma, preservation and disposal of biological samples material. Basic statistics (mean, SD, CV, normal distribution, probability).

#### References

1. Albert S. Tarendash, Let's Review Chemistry, The Physical Setting; 5<sup>th</sup> edition (2014) Barron's Educational Series.
2. Mary Campbell, Biochemistry; 8<sup>th</sup> Edition, (2014); Cengage Learning.
3. Nelson D L, Cox Michael M., Principles of Biochemistry; 6th edition (2013) Freeman.
4. U Satyanarayana, Biochemistry; 4<sup>th</sup> edition, 2013; Elsevier.
5. Arya Bhushan and Arun Jyothi, Biochemistry for DMLT; 3<sup>rd</sup> edition (2022) DYNAMICS Publisher, Hyderabad.
6. Vasudevan D. & Sree Kumari S., Text Book of Bio Chemistry for Medical Students, Jaypee Brothers, New Delhi.

  
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## Practical

### Lab-II: Biochemistry

M.M. 100 Marks

1. Introduction to pathology- Principles of Laboratory work, medical ethics, Para and cleanliness.
2. Principle, function, maintenance and use of various equipments like-centrifuge, electric stove, sterilizer, microscope and its component part, simple, Analytical, electronic balance, microtomes, Automatic knife and sharpeners, Automatic slide Stainer, incubator, electronic cell counter, Automatic tissue procured beep, freeze, Preening, Macro tome, and cryostat.
3. Cleaning and care of general laboratory glassware and equipment.
4. Preparation of the stains and solution required in pathology
  - Preparation of Primary standard: 1N Sodium Carbonate.
  - Preparation of 2/3N Sulfuric acid.
  - Preparation of 10g/dl Sodium Tungstate.
  - Preparation of Normal Saline (Quantity 1Lt).
5. Collection of sample/blood.
6. Demonstration of Kidney function test. Gastric function test & liver function test.
7. Demonstration of Enzyme Analysis - Acid and Alkaline phosphates, SGOT/SGPT, Lactate dehydrogenase, CPK.
8. Lipid profile.
9. Estimation of Blood/ serum- Glucose, G.T.T. Urea, Creatinine, uric Acid, Cholesterol. Bilirubin. Protein& A/G Ratio, Glycosylated Hb.
10. Demonstration of semi-automated, fully automated Biochemical Analyzers.
11. Demonstration/ Exposure to Radioimmuno assay laboratory.
12. Visit to Laboratory / pathology/ hospital of National Importance

  
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**Outcome of the course**

The student will be able to know the basic components of blood and their significance in normal health, by examination of blood, various types of diseases can be diagnosed.

**HAEMATOLOGY:**

1. Introduction to Haematology; Laboratory Organization. Lab. Safety and instrumentation; Maintenance and Equipments of Haematology Lab Introduction to a microscope - Parts of a microscope - Centrifuge - Automated Cell Counter - Urine Analyzer - Maintenance of equipments in the hematology lab - Coagulometer ; Responsibilities of a lab technologist.
2. Composition and function of blood.
3. Collection of blood; various anticoagulants, their uses, mode of action and their merits and demerits. Preservation of blood for various hematological investigations.
4. Physiological variations in Hb, PCV, TLC and platelet.
5. Normal and absolute values in hematology. 8. Quality assurance in hematology.
6. Haemoglobinometry, various methods of estimation of Hb, errors involved and standardization of instrument for adaptation for Hb estimation.
7. Hemocytometry, procedures for cell counts visual as well as electronic, red cell, leucocytes and platelet counts; an error involved and means to minimize such errors.
8. Romanowsky dyes, preparation and staining procedure of the blood smears.
9. Morphology of normal blood cells and their identification.
10. Erythrocyte sedimentation rate, factors influencing and various procedures for its estimation with their significance.
11. Haemocrit value by macro and micro methods their merit and demerits.
12. Routine examination of urine.
13. Examination of biological fluids such as CSF, etc.
14. Examination of semen
15. Development of WBCS (Leucopoiesis); TWBC & DWBC count – LEUKAEMIAS
16. Absolute values, ESR, PCV, Reticulocyte count; Platelet count BT & CT
17. LE cell preparation, sickling test, osmotic fragility
18. Bone marrow examination.

**19. BLOOD BANKING:**

- a. Blood group – ABO system, Rh typing
- b. Cross matching, Coombs test,
- c. Donor screening; Blood transfusion & transfusion reactions

**20. CLINICAL PATHOLOGY:**

- a. Physical, chemical & microscopic examination of urine
- b. Stool examination; Semen examination
- c. CSF exam. & other body fluids
- d. Parasites; Introduction and Parasite in Blood, stool & Urine

**References:**

1. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4th Ed. Jatpee Bros, New Delhi
2. Satish Gupta Short text book of Medical Laboratory for technician J.P. Bros, New Delhi
3. Shirley Mitchell Lewis, Barbara J. Bain, Imelda Bates (2006) Dacie And Lewis Practical Haematology, 10th Ed, Churchill Livingstone/Elsevier.
4. Barbara A. Brown (2008) Hematology: principles and procedures 6th Ed Lea & Febiger.
5. Bernadette F. Rodak, George A. Fritsma, Kathryn Doig (2007) Hematology: Clinical Principles and Applications 3rd Ed, Elsevier Health Sciences.
6. Maheswari; clinical pathology, hematology and blood banking (for DMLT Students), Jaypee Publisher. New Delhi



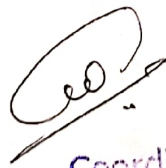
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## Practical

### Lab-III- Pathology –I: Haematology, Blood Banking & Clinical Pathology M.M. 100 Marks

1. Laboratory management – Sample Collection, Labeling, Transport, Screening, Reporting and Dispatch of Reports. (Hospital/pathology visit)
2. Collection of Blood Samples and labeling
3. Blood Smear preparation
4. Staining Of Blood Smear
- 5.: Obtaining Cell Counts –both manual and automated-
  - i. Red blood cell count.
  - ii. Total white blood cell count.
  - iii. Platelet count.
6. Absolute Eosinophils Count
7. Estimation of Hemoglobin, TRBC Counts
8. Packed Cell Volume, Erythrocyte Indices
9. Reticulocyte Count
10. Differential count of white blood cells.
11. Bleeding Time
12. Clotting Time
13. Paraffin section cutting.
14. Staining by Hematoxylin & Eosin and other special stains.
15. Calculation of red cell indices.
16. Disposal of infective material like samples and containers



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## MDTN -140: Pathology-II: Microbiology, Virology, Parasitology & Serology

Total No. of Hrs.-60

### Outcome of the course:

A large number of diseases is caused by infections of organisms, the microbiology and parasitology gives the knowledge about various infectious agents and their role in different infectious diseases.

### Course outline:

1. Introduction and brief history of microbiology; Safety measures in microbiology; Care and handling of laboratory animals. Laboratory organization, management, recording of results and quality control in microbiology.
2. Care and maintenance of laboratory equipments; Care and handling of various microscopes – Binocular, DGI, phase – contrast, fluorescence and electron microscopes.
3. General characteristics, morphology and classification of bacteria and fungi; isolation and culture of bacteria; Aerobic and anaerobic culture methods.
4. Growth and nutrition of microbes; Preparation, uses and standardization of culture media.
5. Principles and methods of sterilization; Uses and mode of action of antiseptics and disinfectants; Handling and cleaning of glassware apparatus. Decontamination and disposal of contaminated material.
6. Principles of staining methods and preparation of reagents.
7. General characters and nature of antigens and antibodies; Principles of Antigen Antibody reactions.
8. Collection, transportation and processing of clinical samples for microbiology investigations.
9. Principles and mode of action of antibiotics and chemotherapeutic agents for bacteria and fungi.

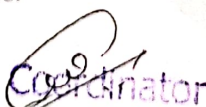
### Virology

1. Introduction to Medical Virology.
2. Nomenclature and classification of viruses.
3. General characteristics of viruses: physical, chemical and biological properties.
4. Collection, transport, processing and storage of sample for viral diagnosis.

### Parasitology

1. Introduction to medical and safety.
2. General characters and classification of protozoa.
3. Laboratory procedure collections, preservation and processing of samples for parasites stool/blood/fluids/tissue/biopsy.
4. Morphology and life cycles of intestinal protozoa, Amoeba-Giardia.
5. Laboratory diagnosis of intestinal protozoa infection: -Amoeba-Giardia.
6. Morphology and diagnosis of oral of – trichomonas vaginal flagellates – E.Gingivalia.
7. Morphology and life cycle of Haemopro- malaria protozoa-parasite.
8. Laboratory diagnosis of malarial infection.
9. General characters and classification of medical helminthology.
10. Morphology and life cycles of Nematodes (Intestinal), -Ascaris, Enterobius, -ancylostoma, - Strongyloides.

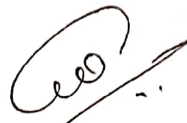
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1. Fischbach, 2005. Manual of lab and diagnostic tests, Lippincott Williams Wilkins, New York.
2. Gradwohls, 2000. Clinical laboratory methods and diagnosis. (ed) Ales C. Sonnenwirth and leonard jarret, M.D.B.I., New Delhi.
- 3; J Ochei and Kolhatkar, 2002. Medical laboratory science theory and practice, Tata McGraw-Hill, New Delhi.
4. Kanai L. Mukherjee, 2007, Medical laboratory technology Vol.1.Tata McGraw Hill.
5. Nanda Maheshwari, Clinical Microbiology and Parasitology; 3<sup>rd</sup> ed (2016); Jaypee Brothers Medical Publishers, New Delhi.
6. Ranjan Kumar, Diagnostic Microbiology, 1<sup>st</sup> edition, (2009); Jaypee Brothers Medical Publishers; New Delhi.



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## Practical

### Lab-IV: Pathology-II: Microbiology, Virology, Parasitology & Serology M.M.100 Marks

1. Introduction to use of different laboratory instruments and their safety precautions
2. Using of autoclave, hot air oven and other common laboratory equipment etc.
3. Use and care of microscopes
4. Disinfection practices in laboratory and wards. 9. Assay for disinfection.
5. Measurement of microbes by micrometry
6. Simple staining methods and gram stains
7. Special staining methods – capsule, spore, acid fast, Metachromatic etc.
8. Tests for motility in bacteria.
9. Preparation of media.
10. Techniques of cultivation of bacteria.
11. Isolation of bacteria from clinical specimens
12. Biochemical testing – Catalase, oxidase, citrate, urease, TSI, Carbohydrate fermentation, MR VP, Indole Test.
13. Purification of microbial cultures.
14. Standard Plate Count.
15. Antibiotic sensitivity test
16. Isolation, Characterization and identification of pathogens from various clinical specimens.
17. Examination of stool for parasites.
18. Culture techniques for parasites

#### Mycology:

- a. Lacto phenol blue staining.
- b. KOH Preparation.
- c. Morphology of fungi/ Yeasts.
- e. Culture demonstration of contaminants- Aspergillus, Penicillium, Mucor, Rhizopus
- f. Dermatophytes.
- g. Dimorphic fungi.

#### Serology:

- h. Diagnosis of syphilis – VDRL test
- i. Diagnosis of Typhoid – Widal test
- j. RA test/ Elisa test

  
Coordinator

Institute of Paramedical Sciences  
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