



Shri Vaishnav Vidyapeeth Vishwavidyalaya Indore
Shri Vaishnav Institute of Paramedical Sciences
DMLT (Diploma in Medical Laboratory Technology)
Syllabus DMLT III SEMESTER
Session 2023-2024

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam (60%)	Two Term Exam (20%)	Teacher Assessment (20%)	End Sem University Exam (60%)	Teacher Assessment (40%)				
DMLT301	CC	Anatomy & Physiology III	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based on the following components: Quiz/Assignment/ Project/Participation in class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will

CEO1: Rationalize the fundamental knowledge of the human body system.

CEO2: Understanding detailed functioning about human system histology.

CEO3: Gain knowledge about clinical conditions of different body systems.

Course Outcomes (COs): Student should be able to

CO1: Understand the human system with emphasis on normal and pathophysiological conditions.

CO2: Acquainted with the different body systems and their prime functions.

CO3: Identification of the different clinical conditions with their signs and symptoms.

CO4: Learn some important clinical identification processes of diseases.

Unit-I

Skeletal system, bones, joints, and muscles.:

- Classification and Functions of Bones. Gross structure of an adult long bone. Development and classification of bone.
- Classification of bone joints: Fibrous, Cartilaginous and Synovial joints
- Muscles: Types and functions. E-C coupling. Changes during muscle contraction.

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Unit-II

Nervous system :

- Parts of nervous system. Structure of neurons. Action potential generation.
- Summary of cranial nerves.
- Autonomic nervous system: structure and functions,
- Spinal nerves.
- Special senses.

Unit-III

Urinary system:

- Glomerular filtration. Determination of GFR.
- Urine formation with reference to Counter current mechanism.
- Nervous control in micturition process.
- Urinary tract infection, Chronic Kidney Disease, Acute Kidney Disease

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Unit-IV

The Cardiovascular System:

- Circulations: Systemic & Pulmonary. Regional circulations: Coronary and Carotid circulations
- Blood pressure: Types of blood pressure; determination of blood pressure; Hypertension and Hypotension.
- Different cardiovascular diseases.
- Significances of ECG in different cardiac disorders.

Unit-V

Endocrine & Reproductive system:

- Secretion of Insulin. Diabetes Mellitus: Types and causes. Functions of Adrenal cortical hormones and their diseases.
- Parathyroid gland and its functions.
- Male reproduction: Spermatogenesis
- Female reproduction: Oogenesis, Menstruation, Ovulation, Implantation and Pregnancy.

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DMLT301(P)	CC	Anatomy & Physiology III (Practical)	00	00	00	30	20	0	0	2	1

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***Teacher Assessment** shall be based on the following components: Quiz/Assignment/ Project/Participation in class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will

CEO1: identify various bones present in the human body.

CEO2: develop understanding about vitals of human cardiovascular system and factors affecting them.

CEO3: understand, analyze and interpret various histological tests for blood.

Course Outcomes (COs): Student should be able to

CO1: understand and identify the human bones with emphasis on general anatomy and general histology.

CO2: distinguish various human bones based on their respective

CO3: memorize and perform various clinical tests.

CO4: analyze and interpret the results of various blood tests.

List of Practical's

- Bone identification according to their anatomy.
- Determination of different superficial and deep reflexes.
- Determination of Pulse. Different factors affecting pulse.
- Determination of Blood pressure. Different factors affecting Blood pressure.
- Differential count of WBCs.

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Reference books

1. G.K. Pal (2021). *Textbook of Medical Physiology, 4th edition*. Elsevier.
2. Gyton A.C and Hall J.E. (2020). *Textbook of medical physiology*, Prism Books(Pvt) ltd. Bangalore.
3. C.C. Chatterjee . *Human Physiology* Vol.1 and Vol.2, CBS Publishers & Distributers.
4. Graaff et al, (2013). *Schaum's Outline of Human Anatomy and Physiology*. McGraw Hill Education. New York City.
5. C. Shier David et al, (2012), *Hole's Human Anatomy and Physiology*, McGraw Hill Education. New York.
6. Seema Tripathi, *Human Anatomical and Physiological Systems*, Viva Books Pvt. Ltd.

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DMLTT302	CC	Biochemistry-III	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will -

CEO1: Understanding of how enzymes and metabolites in the living system work to synthesize different biomolecules and produce energy.

CEO2: Comprehensive knowledge about biochemical pathways involved in intermediary metabolism and regulation of carbohydrate, protein, lipid

Course Outcomes (COs): Students should be able to:

CO1: Understanding of structure and function and action of enzymes & vitamins

CO2: To understand the energetics and biochemistry of metabolic pathways.

Unit I:

Overview of Clinical Biochemistry: Introduction & importance to clinical biochemistry;
Review of clinical aspects of carbohydrates; Lipids; Proteins and Amino Acids metabolism;
Integration of Metabolism, Enzymes

Unit II:

Disorders of Carbohydrate metabolism: Introduction - Normal, fasting and post prandial level, maintenance of blood glucose concentration-hypo and hyperglycemia, renal threshold value. Diabetes Mellitus: types, clinical features, metabolic defects, complications

Unit III:

Diseases in protein metabolism: Introduction - Clinical significance and variation of plasma and serum protein; Clinical features of phenylketonuria, alkaptonuria, albinism and tyrosinosis; Disorders in urea cycle.

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DMLTT302	CC	Biochemistry-III	60	20	20	0	0	3	0	0	3

Unit IV:

Disorders in lipid metabolism: Introduction, hyper triacylglyceridemia, hypo and hyperlipoproteinemia; Atherosclerosis - clinical features and complications; Lipid storage disease, fatty liver.

Disorders in nucleic acid metabolism: Gout-types, etiology and clinical features.

Unit V:

Liver function tests: - Serum enzymes in liver disease- Serum transaminases (SGOT and SGPT), and phosphatases.

Renal function tests - Introduction, clinical significance of GGT, LDH and creatine phosphokinase in kidney function.

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DMLT302(P)	CC	Biochemistry-III (Practical)	00	00	00	30	20	0	0	2	1

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Course Educational Objectives (CEOs): The students will-

CEOs 1: Explain the clinical significance of the laboratory tests

CEOs 2: Perform routine clinical laboratory procedures within acceptable quality control parameters in Hematology, Chemistry, Immunohematology, under the general supervision of a Clinical Laboratory Scientist or Pathologist.

Course Outcomes (COs): Student should be able to -

COs 1: perform the Biochemical test

COs 2 perform clinical urine tests for diagnostic purposes

COs 3 perform the hematology-based analysis

List of Practical's:

1. Blood glucose analysis.
2. Glucose tolerance test
3. Serum bilirubin estimation.
4. Determination of SGOT.
5. Determination SGPT.
6. Estimation of total protein

REFERENCE BOOKS

1. Medical Biochemistry- Dr. M.N. Chatterjee III Edition, 1998 JAYPEE BROTHERS, Medica publishers (p) LTD, New Delhi.
2. Textbook of Medical Laboratory Technology by Prafull G B Godkar latest edition.
3. Practical Clinical Biochemistry- Harold Varley, Fifth edition, CBS Publication and Distributors, New Delhi.

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DMLT304	CC	Microbiology & Serology-III	60	20	20	00	00	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will:

CEOs1 Equip students with the knowledge & practical skill to operate microscope

CEOs 2 The course provides the conceptual basis for understanding pathogenic microorganisms and the mechanisms by which they cause disease in the human body.

CEOs 3: To study various Bacterial, Viral, Protozoan and Fungal diseases.

Course Outcomes (COs): Students should be able to:

COs 1: Students will be able to understand the microflora in human body in relation to pathogenesis and epidemiology

COs 2: Students will be able to correlate disease symptoms with causative agent, isolate and identify pathogens

COs 3: knowledge about various clinically important disease causing bacteria, virus, protozoa and fungi

Unit-I

Microscopy principle and structure: :

Simple microscopy, Bright field microscopy, Dark field microscopy, phase contrast microscopy, florescence and electron microscopy (TEM and SEM)

Unit-II

Immunology and Serology

Emphasis on principal and uses/application, Immunity –Basic principles and classification, Antigen, Antibody (Immunoglobulin's), Complement system, Antigen – Antibody reactions, RIA, ELISA and different skin tests used for diagnosis., Immunodeficiency diseases including AIDS in brief, Vaccines-classification & uses.

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DMLT304	CC	Microbiology & Serology-III	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in class, given that no component shall exceed more than 10 marks.

Unit III

Systemic Bacteriology:

Definition & Classification -Staphylococcus-Streptococcus-Micrococci-Pneumococcus Neisseria-Corynebacteria-Bacillus-Clostridium-Enterobacteriaceae-Klebsiella Escherichia coli-Proteus-Salmonella-Shigella-Pseudomonas-Spirochetes.

Unit-IV

Virology

General properties & Classification of virus-Laboratory diagnosis of viral infections: Hepatitis virus-Human Immunodeficiency virus-Polio Virus, Rabies Virus.

Unit-V

Parasitology

Introduction: Normal microflora of human body, nosocomial infections, carriers, septic shock, septicemia, pathogenicity, biosafety levels.

Introduction & classification of medically important parasites, Intestinal & Tissue protozoa (E.histolytica, Giardia Primary Amoebic meningo encephalitis) - Intestine, Malaria parasite, Leishmanial parasites,

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DMLT304(P)	CC	Microbiology & Serology-III (Practical)	00	00	00	30	20	0	0	2	1

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in class, given that no component shall exceed more than 10 marks.

List of Practical's

1. Demonstration of hot air Oven and sterilization of glassware
2. Demonstration of Autoclave and sterilization of media
3. Demonstration of Incubator
4. Staining methods: Gram's staining permanent slides showing acid fast staining, Capsule staining and spore
5. Identification of pathogenic bacteria (any two) based on cultural, morphological and biochemical characteristics.
6. To prepare temporary mounts of Aspergillus and Candida by appropriate staining.

➤ **Practical's will be modified as per the feasibility.**

REFERENCE BOOKS Microbiology

- Anathanarayana & Panikar Medical Microbiology
- Willey, J. M., Sherwood, L. M., & Woolverton, C. J. (2014). **Prescott's microbiology**. McGraw-Hill.
- Pelczar Mj, Chan ECS and Kleig NR. (1993). **Microbiology**. Tata McGraw Hill. New York.
- LM Prescott. (2002). **Microbiology**. McGraw Hill. New York.
- Stuart Hogg, (2005) **Essential Microbiology**, Wiley and Sons. New York.
- Copal E Hopier . 2011). **Manual of Clinical Laboratory methods**. Medical Laboratory.

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DMLT303	CC	Haematology & Blood Banking-III	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Course Educational Objectives (CEOs): The students will-

CEO1: To understand basic ideas and techniques of Pathology.

CEO2: To understand the basic principles of pathological tests.

Course Outcomes (COs): Student should be able to -

CO1: develop competency in techniques of Haematology.

CO2: acquire knowledge and understand the basic pathologies of biological fluids.

Unit-I

Introduction to Haematology:

- Introduction to Pathology & subdivision of pathology.
- Complete Blood Count
- Hemoglobin Estimation
- Red cell Indices (MCV, MCH, MCHC)

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DMLT303	CC	Haematology & Blood Banking-III	60	20	20	0	0	4	0	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Unit II

Basic of Haematology & Blood banking:

- Cross Matching or Compatibility test in blood transfusion.
- Blood component separation.
- Separation and difference between Serum & Plasma.

Unit-III

Techniques in Haematology

- Techniques of CBC Test.
- Preparation of red cell suspension.
- Sickling test for Sickel Cell Anemia

Unit-IV

Coagulation study:

- Bleeding time
- Clotting time
- Prothombin time & PT INR
- Activated Partial Thrombin Time

Unit-V

Staining procedures:

- Romanowsky staining's.
- Leishman staining.
- Field staining

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Course Educational Objectives (CEOs): The students will-

CEO1: understand, analyze and interpret Haematology.

Course Outcomes (COs): Student should be able to -

CO1: memorize and perform haematology tests.

CO2: analyze and interpret the results of haematology.

List of Practical's:

- ESR, PCV Estimation
- BT, CT.
- Crossmatching.
- Leishman staining.
- Red Cell Indices

REFERENCE BOOKS Pathology —

- Porter R. (1997) The greatest benefit to mankind: a medical history of humanity from antiquity to the present. HarperCollins, London.
- B. Rosai J (1997). Pathology: a historical opportunity. Americal Journal of Patholog. Muir's Textbook of Pathology.
- M.I. Filipe et.al. (202). Histochemistry in Pathology. Churchill Livingstone. London.
- Textbook or MLT by Prafull B Godkar latest edition.

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Vishwavidyalaya, Indore

Controller of Examinations

Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Registrar

Shri Vaishnav Vidyapeeth
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