मौलाना आज़ाद नेशनल उर्दू यूनिवर्सिटी مولانا آزاد نیشنل اُردو یونیورسٹی

MAULANA AZAD NATIONAL URDU UNIVERSITY

(A Central University Under Ministry of Education, Government of India)

Accredited 'A+' grade by NAAC

SCHOOL OF SCIENCES

Department of Vocational Studies and Skill Development

B. Voc. (Medical Laboratory Technology)
SEMESTER- I

S. No.	Component	Title of The Paper	Paper Code	Credits	Marks (Theory)		Marks (Practical)		Total
					External Assessment	Internal Assessment	External Assessment	Internal Assessment	
1.	Skill Paper - 1	Human Anatomy & Physiology (Theory)	BVML111CCT	04	70	30	---	---	100
		Human Anatomy & Physiology (Lab.)	BVML111CCP	02	---	---	35	15	50
2.	Skill Paper - 2	Introduction to Medical Lab Technology-I (Theory)	BVML112CCT	04	70	30	---	---	100
		Introduction to Medical Lab Technology-I (Lab.)	BVML112CCP	02	---	---	35	15	50
3.	Skill Paper - 3	Biochemistry (Theory)	BVML113CCT	04	70	30	---	---	100
		Biochemistry (Lab.)	BVML113CCP	02	---	---	35	15	50
4.	Non-Skill Paper - 4	English Communication Skills (Theory)	BVEN111SET	04	70	30	---	---	100
5.	Non-Skill Paper - 5	Cell Biology and Biodiversity (Theory)	BVML111PET	03	35	15	---	---	50
		Cell Biology and Biodiversity (Lab.)	BVML111PEP	01	---	---	35	15	50
6.	Non-Skill Paper - 6	Basic Computers and Information Science (Theory)	BVCS111SET	03	35	15	---	---	50
		Basic Computers and Information Science (Lab.)	BVCS111SEP	01	---	---	35	15	50
		Total		**30**					**750**
Mandatory Non CGPA Courses									
7.	Non-Skill Paper - 7	Islamiyat (Theory)	UGIS101NCT	02	35	15	---	---	50
		Total		**02**					**50**

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Skill Paper - 1) Human Anatomy & Physiology Part-II (Theory)

Credits – 04

Human Anatomy

Unit I) :

Introduction to anatomical terms and organization of the human body. Tissues, Definitions, types, characteristics, classification, location, functions, and formation. Musculoskeletal system : Bones- types, structures, Axial, and appendicular skeleton. Bone formation, and growth, joints, classification and structures, types and structures of muscles. Movements at the joints, and muscles producing movements.

Unit II) :

Anatomy of gastrointestinal tract, components of G I tracts, Oral cavity, Tonsils, Pharynx, Alimentary canal, Salivary glands.Anatomy of Digestive system, Stomach, Small & Large intestine, Liver, Gall bladder, Pancreas, Spleen, Biliary apparatus.

Unit III) :

Anatomy of Cardiovascular system, Circulatory system, structure of Heart, Location, Chambers, Blood Vessels- Arterial & Venous system, Systemic and pulmonary circulation, names of Arteries, Veins, & their positions, gross and microscopic structure of Lymphatic tissues.

Unit IV) :

Anatomy of respiratory system, Detailed study of Organs of Respiratory system, Nasal cavity, Larynx,Trachea, Lungs, Bronchial tree, Diaphragm-Detailed study of all organs.

PHYSIOLOGY

UNIT I) :

Blood-Plasma & Cellular components, RBC, WBC & Platelets, (morphological features, and functions) Haemoglobin (Structures, and functions) Homeostasis, & blood coagulation, Clotting factors, Mechanism of clotting, Disorders of clotting factors, Blood grouping system, by ABO & RH Typing, Cross matching, Rh Factor & Rh incompatibility, Blood Transfusion.

UNIT II) :

Gastro Intestinal Tract functions of Alimentary canal, Digestive glands, pancreas, Liver, Diglutition, composition, functions & Secretion of Saliva, Gastric Juices, Pancreatic Juice & Bile, Functions of Liver, Gall bladder, Pancreas, Spleen, Small & Large Intestines.

Unit III) :

Physiology of Heart, Properties of Cardiac muscle, Cardiac cycle, Cardiac output, Conduction system of heart, Areas of auscultation blood pressure. (Definition of normal value,clinical measurements of BP, regulation of BP, Hyper tension, Hypo tension, Regulation of Heart Rate, Pulse-Jugular, Radial pulses, ECG: definition, Documentation, & Significance.

Unit IV) :

Respiratory System: Functions of Respiratory System, stages of Respiration, Transport of respiratory gases, Respiratory regulation, Hypoxia, Cyanosis, Asphyxia, dead space, Uneven ventilation, Artificial Ventilation, Lungs Volumes (TV, IRV.ERV,Vital capacities, FEV I, FEV II, FEV III) , Oxygen dissociation Curve, Co2 Dissociation Curve.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Skill Paper - 1) Human Anatomy & Physiology Part-II (Lab/Practical)

Credits – 02

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1. Introduction of human body parts.
2. Skeletal system.
3. Different types of Bones.
4. Components of GI tract
5. Different types body organs (Brain, Heart, Liver, Lungs, Kidneys, Pancreas, spleen etc.
6. Cardiovascular system Estimation of BP
7. Respiratory system Spirometer
8. Identification of blood group
9. Understanding ECG

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Skill Paper - 2) Introduction to Medical Lab Technology-I (Theory)

Credits – 04

UNIT-I) :

Laboratory services
Levels of laboratory- Primary level,Secondary level,and tertiary level. Reference laboratories, Research laboratories, and specific disease, reference laboratories.

UNIT-II) :

A) Laboratory Space : Reception, specimen collection, Quality water supply,power supply,Work area, sample /specimen/slide storage area, cold storage,record room, wash rooms,Bio medical waste room,fire safety techniques.
B) Personnel in the laboratory: Qualifications as per NABL Documents.
C) Listing, cleaning, maintenance, SOP, verification of performance, Internal quality control.
D) Reagents and materials: Purchase, maintenance, storage, use.

UNIT-III) :

Specimen collection, storage & Transportation: General guidelines of sample collection, Labeling, handling, transportation,storage of specimen. Reporting of test results, Specimen Rejection record, record of laboratory data.

UNIT-IV) :

BMW, Accidents & emergencies, in the laboratory.
General safety measures, bio safety precautions, levels of bio safety laboratories: BSL 1,BSL2, BSL 3,BSL 4.

Ethical consideration : Non-Maleficence, beneficence, risk minimization, Institutional arrangements, ethical review, transmission of ethical values, voluntariness,, compliance.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Skill Paper - 2) Introduction to Medical Lab Technology-I (Lab/Practical)

Credits – 02

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1. Preparation of patients for Sample collection.
2. Sample collection.
3. Labeling, storage, Transportation, & Handling.
4. Different types Vacutainers.
5. Bio-medical waste management.
6. Lab safety & personnel safety.
7. First AID in Laboratory.
8. Introduction of Different types of glass ware used in the Laboratory.
9. HB estimation by Shali's Method.
10. RBC counting by Neubar's counting chamber.
11. WBC counting by Neubar's counting chamber.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Skill Paper - 3) Biochemistry (Theory)

Credits – 04

UNIT-I) :

Carbohydrates, Definition, functions, classification, structural aspects, Isomerism, reaction of Mono sacharides, disacchrides, polysaccharides, hetero, homo polysaccharides, glyco protiens, Diabetes mellitus, type 1 & 2, blood glucose regulation, hormones role, OGTT, other investigations.

UNIT-II) :

Lipids- Definition, functions, Classifications, Fatty acids, types, triacylglyceral, Properties of TAG, Phospho lipids, glycolipids, lipoprotines, steroides, cholesterol. All chemistry related aspects.

UNIT-III) :

Proteins, & amino acids, definition, functions, amino acid classification, essential & non essential properties, physical& chemical, protein structure, properties. Denaturation, classification of proteins, plasma proteins, Albumin, Globulin, Immunoglobulins.

UNIT-IV) :

Nucleic acid. Definition, functions, structures,nomenclature, purines, pyrimidins, structure of DNA, (Double helical & other types), Denaturation of DNA, structure of RNA, other types, Differences between RNA, DNA & functions of DNA & RNA.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Skill Paper - 3) Biochemistry (Lab/Practical)

Credits – 02

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1. Normal constituent of urine
2. Abnormal constituents of urine
3. Qualitative Identification of carbohydrates.
4. Qualitative Identification of proteins/ amino acids.
5. Quantitative estimation of Glucose.
6. Quantitative estimation of proteins.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Skill Paper - 1) English Communication Skills (Theory)

Credits – 04

Course Title: **English Communication Skills**

Scheme of Instruction
Total Duration: 60 hrs.
Periods / Week: 4
Credits: 4
Instruction Mode: Lecture

Scheme of Examination
Maximum Marks: 100
Internal Evaluation: 30
End Semester: 70
Exam Duration: 3 hrs.

Course Outcomes: Upon the completion of the course, the students are expected to have enhanced their communication skills in English.

Course Objectives: The course aims at the following objectives:
1. Students will be familiar with the basic Grammar concepts and common medical vocabulary.
2. Students will be able to demonstrate effective reading and listening skills.
3. Students will be able to demonstrate effective speaking and writing skills.

Unit	Course Content	Instruction Hours
I	**Language Mechanics** 1. Articles, Parts of Speech 2. Tenses: Types of Past, Present, & Future Tenses 3. Subject-Verb Agreement, Capitalization & Punctuation 4. Medical Vocabulary: Words commonly used in the medical field	15
II	**Listening and Reading Skills** 1. Types of Listening Skills: Listening for specific information, gist, prediction, & inference 2. Listening Comprehension Practice: Listening to conversations, interviews, news, & speeches 3. Types of Reading Skills: Skimming, scanning, intensive reading, and extensive reading 4. Reading Comprehension Practice: Read newspapers, information brochures, and books	15
III	**Speaking Skills** 1. Errors in Pronunciation: Common mistakes in pronouncing difficult words 2. Pronunciation Practice: Producing correct sounds in English and clarity in pronunciation 3. Conversation Skills: Spoken English and day-to-day interaction 4. Speaking Practice: Discussion and giving a speech	15
IV	**Writing Skills** 1. Paragraph construction: Topic sentence, supporting details, and closing sentence 2. Letter Writing: Drafting formal and informal letters and emails 3. Report Writing: Drafting official reports 4. Essay Writing: Introduction, thesis statement, body paragraphs, conclusion	15

Recommended Readings:

1. Doff, A. (2014). *B1 plus intermediate coursebook English unlimited*, special edition. Cambridge University Press.
2. Ludlow, R. & Panton, F. (1995). *The essence of effective communication*. Prentice Hall of India Pvt. Ltd.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Non - Skill Paper - 5) Cell Biology and Biodiversity-I (Theory)

Credits – 03

Microscopy and Organization of Cell-I

Unit-I:

Methods in Cell Biology: Principles of light and electron microscopes, fixation & fixative, staining techniques. Organization of Cell: Extra nuclear and nuclear. Plasma: Structure, Osmosis, active and passive transport, endocytosis and exocytosis. Endoplasmic reticulum: Structure, types and associated enzymes. Mitochondria Structure, mitochondrial enzymes and the role of mitochondria in respiration and mitochondrial DNA. Golgi complex: Structure and functions.

Microscopy and Organization of Cell-II

Unit-II

Ribosomes: Types of ribosomes, their structure and functions. Lysosomes: Polymorphism and their function Centrosome: Structure and functions. Nucleus: Structure and functions of nuclear membrane, nucleolus and chromosomes. An elementary idea of cell transformation in Cancer. An elementary idea of cellular basis of immunity.

Systematic Study of Animals-I

Unit-III

Detailed study of the following animal types: Protozoa: Amoeba, Paramecium and Plasmodium. Prtozoa (Porifera): Sycon, Cnidaria (Coelenterata): Obelia. Classification upto orders with brief ecological note and economic importance (if any) of the following: Protozoa: Entamoeba, Tryanosoma, giardia, Noctiluca, Eimeria, Opalina Vorticella, Balantidium and Nyctiluca, Eimeria, Opalina Vorticella, Balantidium and Nyctotherus. Parazoa (Porifera): Grantia, Euplectella, Hyalonema and Spongilla. Cnidaria (Coelenterata): Hydra, Sertularia, Plumularia, Obelia, Tubularia, Bougainvilllea, Porpita, Velella, Physalia, Rhizostoma Milliapora, Aurelia, Alcyonium, Tubipora, Zoanthus, Metridium, Madrepora, Favia, Fungia and Astrangia.

Systematic study of Animals-II

Unit-IV

Detailed study of the following animal types: Platyhelminthes: Fasciola,
Taenia Aschelminthes: Ascaris, Parasitic adaptations in Helminths. Annelida: Pheretima, Classification upto orders with brief ecological note and economic importance (if any) of the following: Platyhelminthes: Dugesia, Schistosoma and Edchinococcus. Aschelminthes: Ascaris, Oxyuris, Wuchereria. Annelida: Nereis, Polynoe, Eunice, Arenicola, Aphrodite, Amphitrite, Chaetopterus, Tubifex and Pontobdella.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Non - Skill Paper - 5) Cell Biology and Biodiversity-I (Lab/Practical)

Credits – 01

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1. Classification upto orders with ecological notes and economic importance, if any. Of the following animals:
Protozoa:
(a) Examination of cultures of Euglena and paramecium,
(b) slides: Amoeba, Euglena, Trypanosoma, Monocystis, Paramoecium (Binary fission and cjtin.)

Parazoa (Porifera): Specimens: Sycon, Grantia, Euplectella, Hyalonema, Spongilla, Esupongia.
Cnidaria (Coelenterata):
(a) Specimens: Porpita, Velella, Physalia, Aurelia, Rhizostoma Metridium, Millipora, Alcyonium,
(b) Slides: Hydra (W.M) Hydra with buds. Obelia (colony and medusa). Sertularia, Plumularia.

Platyhelminthes:
(a) Specimens: Dugesia, fasciola, Taenia,
(b) Slides: Miracidium, Sporocyst, Redia, Cercaria of Fasio, Scolex nottio, Tamate.
Almns: Ac is maend feleric II, Anylot Ali: Phyetimae is. Hete one I, olyno, Eunce. Arthropoda: Peripatus, Prawn, Lobster, Cancer (Crab). Sacculina, Eupagurus (Hermit crab), Lepas, Balanus, Apis, Lepisma (Silver Fish), Schistocerca (Locust), Poecilocerus, (AK Grasshopper), Gryllus.(Cricket). Mantis (Preying Mantis) Cicada, Forficula (Earwig) Cimex, Scarabaeus (Dung beetle), Agrian (Dragon fly), Odontotermes
Mollusca: Anodonta, Mytilus, Ostrea, Cardium, Pholas, Solen (Razorfush) Peeten, Haliotis, Patella, Aplysia, Doris, Ehindermta: Seschiu, Ohrxa Aneon, Hehordata alanossus

2. CELL BIOLOGY

Paper chromatography. Gel Electrophoresis through photographs or through research laboratories, Familarity with TEM & SEM. Study of different ultrastructures of cell organelles through photographs.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Non-Skill Paper - 6) Basic Computers and Information Technology (Theory)

Credits – 03

Objective- To Develop a basic understanding of computes and their role in the practice of modern medicine.

Unit 1)

Jhon Von Neumann Architecture, different types of computer Hardware, CPU, Input Devices, Out put devices, Storage Devices, Communication Devices, Configuration of hardware devices and their application, convert decimal to binary and vice versa.

Unit 2):

Networking- Basic idea of local Area Network (LAN), MAN wide area network (WAN) E-mail, browsers and servers, multimedia, operating system: software needs, application software, programming language, artificial intelligence, windows, print, control panel, paint, calculator, desktop, find, run, snipping tool, sticky note, word pad, notepad, gadgets, windows defender, firewall.

Unit 3)

Microsoft- word commands, formatting text and documents, sorting and tables, background images, hyper links, Mail merge, Graphics, columns, smart art, spelling & grammar, Thesaurus, Translate, watermarks, borders, Drop Cap.

Unit 4)

Microsoft Excel-Conditional formatting, Formulas, Functions, Fill features, Sort& Filter, Wrap text, Merge & Center.Insert - Tables, Illustration, charts, Links, Text, Background, Remove duplicates. Microsoft power point- Designs, slid transition, Smart Art, animation hyper links, automatic slide advance, background images.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Non-Skill Paper - 6) Basic Computers and Information Technology (Lab/Practical)

Credits – 01

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1. Microsoft Word
2. Microsoft power point
3. Microsoft Excel
4. Microsoft Access.

B. Voc. (Medical Laboratory Technology)

SEMESTER-I

(Non-Skill Paper - 7) ISLAMIYAT (Theory)

Credits – 02

As per Department of Islamic Studies