Bachelor of Vocation (Medical laboratory technology)

B.Voc. (MLT) Syllabus

I Semester				
S.No.	**Course Code**	**Subject**	**Content Type**	**Credit**
1	BVMLT-101	Basics of Human Anatomy & Physiology-I	Gen	4
2	BVMLT-102	Basic Concepts of LAB Technology-1	Skill	4
3	BVMLT-103	Fundamentals of Microbiology	Gen	4
4	BVMLT-104	Phlebotomy & Bio Medical Waste Mgmt.	Skill	3
5	BVMLT-105	**Fundamentals of computer**	Gen	3
6	BVMLT-106	**General English**	Gen	2
7	BVMLT-107	**Personal Grooming**	Gen	3
8	BVMLTP-1	Vocational Practical	Skill	2

BVMLT -101 Basics of Human Anatomy & Physiology-1

UNIT-1

Anatomy : Introduction to human body , definition of anatomy, planes, position and movement of human body, anatomy of head and neck, cranial cavity, mouth pharynx, nose, pectoral region, shoulder, scapular region, upper and lower limbs ,bones and joints, pericardium and heart, lungs , diaphragm, trachea, esophagus, thoracic duct, brief introduction of skeletal system, organization of skeleton, definition, classification, constituents of bones and bone tissue, growth and development of bones, bones of cranium, electronic microscopic structure of cell, Structure of arteries, veins and capillaries

UNIT-2

Anatomy : Tissue- classification, functions and structure of primary tissues – epithelial tissue, connective tissue, muscular tissue, nervous tissue, function of arteries, veins and capillaries, cardiac cycle and heart sound, factors affecting heart rate and its regulation, physiological variations, factors controlling blood pressure, hemorrhage and shock, disease related to cardiovascular system, definition and classification of muscular tissue, characterization of skeletal, smooth, cardiac muscles, types of cartilage, skeletal, smooth and cardiac muscle.

UNIT-3

Physiology: introduction on physiology, cell-description of cell and its components, functions of cell, homeostasis, basics about different organs and systems, structure and functions of urinary system, organs of urinary system, glomerular filteration, physiology of urine formation, functions of kidney, glomerular filteration rate.

UNIT-4

Physiology: Introduction to blood and its components, functions of RBCs, WBCs and platelets, difference between serum and plasma components and organs of lymphatic system, introduction to reproductive system, structure and functions of male and female reproductive organs, parts of male and female reproductive organs.

BVMLT – 102 Basic concepts in MLT-1

UNIT-1

Basic principles and procedures of Laboratory: to develop understanding of the concept of healthy living, laboratory hazards, measuring and dispensing liquid, safety precautions with glass and plastic containers, choose glass or plastic container, clean glass and plastic, pH and buffer solution, procedure of hand hygiene, to be equipped with techniques of use of PPE.

UNIT-2

Care and maintenance of glassware: for example beaker, jars, flasks, test-tubes, Petri dishes, microscope slides, graduated cylinders, graduated pipette, stirring rods etc. cleaning methods, storage of glassware and glass apparatus, types of different laboratory equipments and instrument examples are balance, Bunsen burner, funnel, pipette bulb, autoclave, centrifuge, laminar air flow, hot air oven, incubator, water bath, cell counter, microscope etc.

UNIT-3

Introduction to different laboratory reagents , solutions and stains : for example carbol fuchsin, gram's iodine, giemsa, crystal violet, leishman, saffranine, preparation of reagents for example hypochlorite, ethanol, formaldehyde etc. preparation of different types of media and agar**.**

UNIT-4

Infection control and prevention: Understand practices to curb infection, hospital borne infection, prevention and treatment of needle stick injury, understand the management of blood and body substance spillage in the health care setting.

Reference book: [*P.B Godkar, Henry's clinical diagnosis and management by laboratory methods]*

BVMLT – 103 Fundamentals of microbiology

UNIT-1

Introductory microbiology: Introduction to and brief of microbiology, scope and relevance of microbiology, modern developments in microbiology, explain the types and methods of sterilization, use and types of microscopes; bright microscope, field microscopy, dark field microscopy, phase contrast microscopy, electron microscopy.

UNIT-2

Morphology and structure of microorganisms: Morphology and structure of bacteria, fungi, actinomycete and algae etc., microscopic examination of microorganisms, preparation of culture media, spread plates, pour plates, types of selective and differential media, separation of pure cultures, principles and uses of microbiology equipments and instruments.

UNIT-3

Stains used in microbiology: Introduction to stains; importance of stain in microbiology; types of stains in detailed giving example-simple stain differential stain, negative stain, impregnation method; special staining for certain bacteria, bacterial spores, parasites and fungi; principle, procedure, application and result, interpretation of gram staining and ziehl neelsen staining.

Reference book: *[Burton's microbiology for the health science, the science of laboratory diagnosis, C.P Baveja, P.B godkar* "A Textbook of Basic and Applied Microbiology" by K R Aneja].

BVMLT – 104 Phlebotomy and Bio-Medical waste Management

UNIT-1

Introduction to phlebotomy: To work safely in a lab without cross infection, interpreting investigation slips, the necessary lab equipments used for collection, how to assist patient, how to locate appropriate site for obtaining blood samples, types of veins used for blood collection, how to draw blood specimen from patient, label sample, transport the sample to laboratory, specimen collection (syringe method) and preservation of blood, urine, stool, sputum blood culture etc. duties of phlebotomy technician in preparing, labeling and dispatching the blood reports update patient records.

UNIT-2

Bio-Medical waste Management : to manage bio medical waste in the work place, types of bio hazard bags, uses of different colors and types of bio hazard bags, Disposal of laboratory waste, Basics of accidents, common types of laboratory accidents, first aid in laboratory, human health and medical care in India, Medical laboratories of developing countries, importance of bio medical waste.

Reference Book: [success in phlebotomy, phlebotomy simplified, complete text book of phlebotomy].

BVMLT -105-Fundamental of Computers

Unit-1

Introduction to Computers, History of Computer , Generations, Characteristics, Advantages and limitations of Computer, Classification of Computers, Functional Components of Computer, Input, Output and Processing, Concept of Hardware and Software, Data & Information .Concept of data storage, Number system. Decimal, Binary, Hexadecimal ASCII .

UNIT-2

Introduction to GUI Based Operating System, Basics of Operating system , Basics of DOS & LINUX, The User interface, File and directory management, Windows setting, Control Panel, devices and Printer setting, Using various window commands for desktop.

UNIT-3

Word Processing, Word processing basics, Menu Bar, Opening and closing documents, save & save as , Page setup, print preview, and printing. Text creation and manipulation Editing, cut copy paste, Document creation, editing, Formatting the text – Paragraph indenting, bullets and numbering, changing case, Table manipulation – creation of table , insertion and deletion of cell, row and column.

UNIT-4

Network basics , Internet, Basics of computer network LAN, WAN etc, Concept of Internet, Basic of Internet Achitecture, Services on Internet Architecture, World wide web and websites, Communication on Internet, Internet Services, Preparing Computer for Internet Access, ISPs and Examples, Internet Access Technologies. Web Browsing, Configuring web browser, Popular search engines Downloading and printing web pages. Internet application, Basics of E-mail , E-mail addressing , forwarding and searching, Composing.

BVMLT-106-GENERAL ENGLISH AND SOFT SKILL

Introduction to English language

a) Role and significance of English language in the present scenario

b) English language: its relevance for the Indian industry.

c) Introduction to listening, speaking, reading, writing and bench marking of the class.

Functional Grammar

a) Parts of speech, articles, tenses, verbs and modals.

b) Practice of daily use words, numerals and tongue twisters

c) Vocabulary building, construction of simple sentences: Basic sentence pattern, subject and predicate.

d) Sentence construction – simple, complex and compound

English communication- About myself

a) Let's talk, making conversation, meeting and greeting

b) Introduction myself, my family and my friends

c) My opinions, my likes and dislikes

d) Life at collage, hostel and workplace

PRACTICALS

BVMLTP-101.PRACTICAL ANATOMY AND PHYSIOLOGY

Human anatomy (practical)

Demonstration of

- Study of Human Skeleton parts with skeletal models.
- Study with charts and models of all organ systems mentioned above.
- Microscopic slides examination of elementary human tissues, cells.
- Major organs through models and permanent slides.
- Parts of circulatory system from models.
- Parts of respiratory system from models.
- Digestive system from models.
- Excretory system from models.

Human Physiology (Practical)

- To measure pulse rate
- To measure blood pressure
- To measure temperature

- Measurement of the Vital capacity
- Determination of blood groups
- Transport of food through esophagus
- Calculation and evaluation of daily energy and nutrient intake.
- Measurement of basal metabolic rate
- Demonstration of ECG
- Bile juice secretion and execration 11. Urine formation and execration.

BVMLTP-102- PRACTICALS Basic Concepts of LAB Technology-1

- Principals and working of laboratory instruments
- Importance and methods of cleaning of glass apparatus
- Calibration of apparatus and glasswares
- Preparation and standardization of volumetric solutions
- Basic titration such as acid vs alkali, silver nitrate vs sodium chloride
- Preparation of buffer solution and measurement of their pH Verification of Beer Lamber's Law
- Verification of Beer Lamber's Law
- Verification of Beer Lamber's La
- Determination of serum creatinine : Alkaline picrate Method
- Determination of serum bilirubin
- Malloy and Evelyn
- DMSO method
- Determination of serum glutamate pyruvate transaminase (SGPT) and serum glutamate Oxaloacetate transaminase
- (SGOT) End point reaction
- Sterilization Techniques

BVMLTP-103-Fundamentals of Microbiology

- Use of microscope in examination of unstained bacteria, fungi, algae, parasites and stained cell preparations including simple staining, Gram's staining, acid fast staining, capsule staining, spore staining using
- Prokaryotic and eukaryotic cells, hanging drop preparation.
- Preparation of culture media, spread plates, pour plates,
- Selective media, differential media.
- Separation of pure cultures and study the effect of selective nutrients on prokaryotes
- Isolation of Soil Bacteria, Soil Fungi, Soil Actinomycets
- Selective media for Soil microflora and use of growth factors, Study of Rhizosphere interactions, Quantitative measurements of Soil nutrients and Rhizosphere microflora and preparation of starter cultures of Rhizobia, Azotobacter.

BVMLTP-104-Phlebotomy & Bio Medical Waste Mgmt

- Waste minimization
- color coding
- Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
- BMW Management & methods of disinfection
- Modern technology for handling BMW
- Use of Personal protective equipment (PPE)

BVMLTP 105- PRACTICAL FUNDAMENTALS OF COMPUTER

- Starting MS WORD, Creating and formatting a document,
- Changing fonts and point size,
- Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting
- objects, Page setup, Page Preview, Printing a document, Mail Merge.
- Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text
- wrapping , Sorting data, Auto Sum, Use of functions, referencing formula cells in other

- formulae , Naming cells, Generating graphs, Worksheet data and charts with WORD, Creating
- Hyperlink to a WORD document , Page set up, Print Preview, Printing Worksheets.
- Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank
- Presentation, creating, saving and printing a presentation, Adding a slide to presentation,
- Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word
- art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing
- Note pages, preparing audience handouts, printing presentation documents, MS-Access.
- Creating tables and database, Internet, Use of Internet (Mailing, Browsing, Surfing).