

Bachelor of Vocation (Medical laboratory technology)

B.Voc. (MLT) Syllabus

Year 2nd (Advanced Diploma)

III Semester				
S.No.	Course Code	Subject	Type of Course	Credits
1	BVMLT-301	Basic concepts in MLT-2	Skill	4
2	BVMLT-302	Routine Haematological Test	Skill	3
3	BVMLT-303	Microbial physiology metabolism	Gen	4
4	BVMLT-304	Blood Banking	Skill	3
5	BVMLT-305	Financial Literacy	Gen	2
6	BVMLT-306	Digital Literacy	Gen	2
7	BVMLT-307	Basics of Legal & HR Policies	Gen	3
8	BVMLTP-3	Vocational Practical	Skill	13

III SEMESTER

BVMLT -301 Basic concepts in MLT-2

UNIT-1

Role of the acts and regulation including safety protocols, confidential protocols and home visit protocols, training the technicians, laboratory infrastructure, clinical laboratory management, requisition form, accession list, guidelines of good clinical laboratory, specimen rejection record, data management.

UNIT-2

Role of medical lab technician: To develop broad understanding of the role of MLT, patient comforts, safety and laboratory test result, to exhibit ethical behavior, to develop techniques of grooming, to be vaccinated against common infectious disease, precautions to ensure sample preservation while transport, basics of the first aid, precautions to ensure self safety.

UNIT-3

Documentation: Understand guidelines for documentation, various types of records in laboratory setup, uses and importance of records in laboratory setup, essential requirement of records, understand abbreviations and symbols, enter transcribe, record, store, or maintain information.

UNIT-4

Professional behaviour in healthcare setting: Learn to maintain restful environment, general and specific etiquettes, legal and ethical issues, impact of comfort on patient's

health, importance and methodology of cleanliness, and hygiene environment in collection, acquire elementary knowledge on good clinical laboratory practices of WHO.

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

BVMLT -302 Routine and special Hematological Test

UNIT-1

Routine hematological tests 1: determination of hemoglobin concentration by Sahli's method, cyanmeth method, determination of total erythrocyte count, total leucocyte count, platelet count, packed cell volume (hematocrit), erythrocyte sedimentation rate, enumeration of formed elements.

UNIT-2

Routine hematological tests 2: Determination and calculation of red blood cell indices- MCV(mean cell volume), MCH (mean cell hemoglobin), MCHC (mean cell hemoglobin concentration, study of blood smear, reticulocyte count, differential leucocyte count (DLC) eosinophil count, preparation of blood smear.

UNIT-3

Special hematological tests: screening of sickle cell anaemia, estimation of foetal hemoglobin, hemoglobin electrophoresis, osmotic fragility test, Heinz body preparation, laboratory diagnosis of blood parasites, lupus erythematosus (LE), preparation of bone marrow smear for microscopic examination for microscopic examination, cytochemical tests.

Reference book: [hematology board review, blue prints hematology, diagnostic cytology and hematology, P.B Godkar]

BVMLT -303 Microbial Physiology-Metabolism

UNIT-1

Microbial nutrition, cultivation, isolation and preservation: requirements for growth, physical requirement , chemical requirements , culture media, chemically defined media, complex media, anaerobic growth media, selective media, enrichment culture, cultivation of aerobes and anaerobes, microbial growth, growth in population, bacterial growth, measurement of growth in bacteria, factors affecting growth in microorganisms.

UNIT-2

Enzyme Regulation: enzymes and their regulation, chemical and physical properties of enzymes, nomenclature of enzymes, mechanism of enzyme action. Inhibition of enzyme action, regulation of enzyme, replication of DNA molecules, transcription and translation (process of protein synthesis).

UNIT-3

Microbial metabolism: respiration and fermentation, glycolysis, pentose pathway, the Entner doudoroff pathway, tri-carboxylic acid cycle, catabolism of lipid, protein, glycoxylate cycle, Beta oxidation. Bacterial genetics- conjugation, transformation, transduction.

UNIT-4

Microbial utilization of energy and Biosynthesis: transport of nutrient by bacteria, biochemical mechanism of generation of ATP, synthesis of amino acid- glutamate, lysine, glutamine, serine, arginine family, structure and bio synthesis of peptidoglycon, carbohydrates and phospholipids.

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

BVMLT -304 Blood Banking

UNIT-1

Blood Grouping: introduction, ABO subgroups, red cell antigen, natural antibodies, Rh system, Rh antigen and antibodies, hemolytic disease of new born and prevention, principle of blood grouping, antigen antibody reaction, agglutination, haemagglutination, conditions required for antigen antibody reaction, blood grouping techniques, cell grouping, serum grouping, difficulties in ABO grouping, rouleaux formation, inheritance of blood groups, A&B cell preparation.

UNIT-2

Blood donation and transfusion: principal and practice of blood transfusion, guidelines for the use of blood, blood transfusion practices, procedure for usage, storage of blood, screening of donor, blood donor requirements, criteria for selection and rejection, medical history and personal details, health checks before donating blood, screening for TTI.

UNIT-3

Blood collection, storage and transport and maintenance of blood bank records: blood collection packs, anticoagulants, taking and giving sets in blood transfusion, techniques of collection blood, instructions given to the donor, screening donor's for infectious agents, bacterial contaminated blood, blood donation record book, blood donor card, storage of blood, change in blood after storage, transportation blood bank temperature sheet, stock sheet, blood transfusion request form.

UNIT-4

Compatibility, blood components and blood transfusion reaction: purpose of compatibility testing, single tube and emergency compatibility testing techniques, difficulties in cross match, collection of blood components for transfusion, platelets, packed red cell, PRP, investigation of a transfusion reaction, hemolytic transfusion reaction, actions to take when transfusion reaction occurs.

Reference book: [Basic and applied concepts of blood banking and transfusion practices, blood banking and transfusion medicine, modern blood banking and transfusion practices]

BVMLT-305-ADVANCE COMPUTING SKILL

Unit-1

Advance Word Processing Tools

Setting the layout of Table and documents, Mail merge techniques. Letter envelopes etc, Using spell check and Thesaurus, Foot note nad Endnotes, Using Charts , shapes and pictures in word .

Unit-2

Basics of Spreadsheet, Functions of Spreadsheet, Applications, Elements of Electronic Spread sheet, creating document saving and printing the worksheet, manipulation of cells, Functions and charts, using formulas, Functions and charts

UNIT-3

Advance Spreadsheet Tools, Manipulations with charts and its types, Sorting, Filtering of data, Pivot table, data validation techniques, Grouping and subtotaling of data, Text to column option . Printing of customized worksheet.

UNIT-4

Presentation Software, Using Powerpoint, Opening an powerpoint presentation, Saving a presentation , Entering and editing text, inserting and deleting slides in a presentations , preparation of slides , adding clip arts, charts etc., Providing Aesthetics, Enhancing text presentation ,working with color lines styles and movie and sound ,adding header and footer, presentation.

BVMLT-306-HUMAN VALUE AND PROFESSIONAL ETHICS

UNIT-1

Need, Basic Guidelines, Content and Process for Value Education

Understanding the need, basic guidelines, content and process for Value Education

Self-Exploration its content and process, Natural Acceptance' and Experiential Validation- as the mechanism for self-exploration

Continuous Happiness and Prosperity- A look at basic Human Aspirations

Right understanding, Relationship and Physical Facilities- the basic requirements for fulfilment of aspirations of every human being with their correct priority

Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

Method to fulfil the above human aspirations: understanding and living in harmony at various levels

UNIT 2:

Understanding Harmony in the Human Being Understanding human being Understanding the Body as an instrument Understanding the harmony of Body, correct appraisal of Physical needs, meaning of Prosperity in detail.

UNIT 3:

Understanding Harmony in the Family and Society - Harmony in Human Relationship

Understanding Harmony in the family – the basic unit of human interaction

Understanding values in human-human relationship

Trust and Respect as the foundational values of relationship

Understanding the meaning of trust

Difference between intention and competence. Understanding the meaning of respect

Understanding the harmony in the society (society being an extension of family)

UNIT-4

Natural acceptance of human values

Definitiveness of Ethical Human Conduct

Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order

b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,

c) Ability to identify and develop appropriate technologies and management patterns for above production systems.

Case studies of typical holistic technologies, management models and production systems

Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b) At the level of society: as mutually enriching institutions and organizations

PRACTICALS:

BVMLTP-301-Basic concepts in MLT-2

- To prepare of the 1/10 N HCL
- To prepare the different concentration of solutions.
- To prepare different bulbs required in the laboratory
- To find out the normality of given solution
- Routine examination of urine (physical examination of urine)
- Determination of specific gravity of urine by urinometer and refractometer
- Chemical examination of urine.
- Microscopic examination of urine
- Physical and chemical examination of semen
- Microscopic examination of semen
- Physical examination of stool
- Chemical examination of stool
- Microscopic examination of stool
- Determination of reducing substances in stool
- Determination of reducing substances in stool

BVMLTP-302-Routine Hematological Test

- Determination of blood clotting time 1.capillary method
- 2.tube method
- Determination of the foetal haemoglobin
- Determination of the anti-D antibody titer
- To perform indirect coomb's test

BVMLTP-303-Microbial physiology metabolism

- Measurement of Soil Enzymes.
- Use of ultraviolet light for its germicidal effect.
- The replica plating technique.
- Presumptive, confirmed and completed tests for safety of water supplies
- Effect of temperature, Osmotic pressure, energy source etc. on growth of prokaryotes
- Relation of free oxygen to microbial growth, monitoring
- of dissolved oxygen in various effluents

- Determination of COD in Industrial effluents.
- Effects of antimetabolites on Microbial culture (Inhibition by Sulfanilamide).
- Determination of Water Activity of various substrates and assay of surface active agents.
- Turbidimetric/spectrophotometric monitoring of growth using liquid cultures.
- Efficiency of photosynthesis in photoautotrophs.

BVMLTP-304-Blood Banking

- To perform direct coomb's test
- To perform cross matching test by saline-tube method
- Determination of D by tube method.
- Qualitative test for Determination of D(Rho) antigen on human red blood cells.
- 1.tube method 2.slide method
- Determination of serum sodium and potassium using flame photometer/commercial kit
- Determination of serum chloride
- Determination of bleeding time

BVMLTP-305- Practical Advance Computing skills

- Word Processing
- Mail merge techniques
- Using Charts , shapes and pictures in word .
- Basics of Spreadsheet
- document saving and printing the worksheet
- formulas , Functions and charts
- Advance Spreadsheet Tools
- worksheet.
- Presentation Software
- Using Powerpoint working with color lines
- styles and movie and sound ,presentations.