Study & Evaluation Scheme

of

B.Voc.

(MEDICAL LABORATORY TECHNOLOGY)

[Applicable w.e.f. Academic Session - 2021-22 till revised]

[As per NEP given by UGC]

Sikkim Alpine University

Sikkim Alpine University, Jorethang Road,

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Evaluation Scheme

B.Voc. Degree Programme in **MEDICAL LABORATORY TECHNOLOGY**

(Sikkim Alpine University, Sikkim)

Semester I

Sr. No.	Course Code	Name of the Course	Type of Course	Teaching Scheme			Evaluation Scheme		Credits	Total Marks
				L	T	P	IA	EA		
Theory										
1	BVMT-101	Anatomy - I	Gen	4	0	0	40	60	4	100
2	BVMT-102	Physiology – I & Laboratory Basics-1	Skill	4	0	0	40	60	4	100
3	BVMT-103	Phlebotomy & Waste Management-I	Gen	4	0	0	40	60	4	100
4	BVMT-104	Introduction to Microbiology	Skill	3	0	0	40	60	3	100
5	BVMT-105	Computing Skills-I	Gen	3	0	0	40	60	3	100
6	BVMT-106	Functional English l	Gen	2	0	0	20	30	2	50
Lab/ Practical/ Project										
1	BVMT-151	VOCATIONAL PRACTICAL OF ANATOMY-I	Skill	0	0	2	20	30	2	50
2	BVMT-152	VOCATIONAL PRACTICAL OF PHYSIOLOGY-I & LABORATORY BASICS-I	Skill	0	0	2	20	30	2	50
3	BVMT-153	VOCATIONAL PRACTICAL OF PHLEBOTOMY & WASTE MANAGEMENT-I	Skill	0	0	2	20	30	2	50
4	BVMT-154	VOCATIONAL PRACTICAL OF INTRODUCTION TO MICROBIOLOGY	Skill	0	0	2	20	30	2	50
5	BVMT-155	VOCATIONAL PRACTICAL OF COMPUTING SKILLS-I	Skill	0	0	2	20	30	2	50
Total				20	0	10			30	800

Evaluation Scheme

B.Voc. Degree Programme in **MEDICAL LABORATORY TECHNOLOGY**

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Semester II

Sr. No.	Course Code	Name of the Course	Type of Course	Teaching Scheme			Evaluation Scheme		Credits	Total Marks
				L	T	P	IA	EA		
Theory										
1	BVMT-201	Anatomy - II	Gen	4	0	0	40	60	4	100
2	BVMT-202	Physiology II & Clinical Biochemistry-I	Skill	3	0	0	40	60	3	100
3	BVMT-203	Introduction to Haematology	Skill	3	0	0	40	60	3	100
4	BVMT-204	Laboratory Basics-II & Waste Management-II	Gen	4	0	0	40	60	4	100
5	BVMT-205	Advance Phlebotomy & Lab Ethics	Skill	3	0	0	40	60	3	100
6	BVMT-206	Basics of Economics and Market	Gen	3	0	0	40	60	3	100
Lab/ Practical/ Project										
1	BVMT-251	VOCATIONAL PRACTICAL OF ANATOMY-II	Skill	0	0	2	20	30	2	50
2	BVMT-252	VOCATIONAL PRACTICAL OF PHYSIOLOGY-II & CLINICAL BIOCHEMISTRY-I	Skill	0	0	2	20	30	2	50
3	BVMT-253	VOCATIONAL PRACTICAL OF INTRODUCTION TO HAEMATOLOGY	Skill	0	0	2	20	30	2	50
4	BVMT-254	VOCATIONAL PRACTICAL OF LABORATORY BASICS-II & WASTE MANAGEMENT-II	Skill	0	0	2	20	30	2	50
5	BVMT-255	VOCATIONAL PRACTICAL OF ADVANCE PHLEBOTOMY & LAB ETHICS	Skill	0	0	2	20	30	2	50
Total				20	0	10	0	0	30	850

Evaluation Scheme

B.Voc. Degree Programme in **MEDICAL LABORATORY TECHNOLOGY**

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Semester III

Sr. No.	Course Code	Name of the Course	Type of Course	Teaching Scheme			Evaluation Scheme		Credits	Total Marks
				L	T	P	IA	EA		
Theory										
1	BVMT-301	Bacteriology & Clinical Biochemistry-II	Skill	4	0	0	40	60	4	100
2	BVMT-302	Haematology and Immunology - I	Skill	3	0	0	40	60	3	100
3	BVMT-303	Microbial physiology metabolism	Gen	4	0	0	40	60	4	100
4	BVMT-304	Health & Wellness	Skill	3	0	0	40	60	3	100
5	BVMT-305	Communication Skill-II	Gen	2	0	0	20	30	2	50
6	BVMT-306	Financial Literacy	Gen	4	0	0	40	60	4	100
Lab/ Practical/ Project										
1	BVMT-351	VOCATIONAL PRACTICAL OF BACTERIOLOGY & CLINICAL BIOCHEMISTRY-II	Skill	0	0	2	20	30	2	50
2	BVMT-352	VOCATIONAL PRACTICAL OF HAEMATOLOGY AND IMMUNOLOGY-I	Skill	0	0	2	20	30	2	50
3	BVMT-353	VOCATIONAL PRACTICAL OF MICROBIAL PHYSIOLOGY METABOLISM	Skill	0	0	2	20	30	2	50
4	BVMT-354	VOCATIONAL PRACTICAL OF HEALTH & WELLNESS	Skill	0	0	2	20	30	2	50
5	BVMT-355	VOCATIONAL PRACTICAL OF COMMUNICATION SKILL-II	Skill	0	0	2	20	30	2	50
Total				20	0	10			30	800

Evaluation Scheme

B.Voc. Degree Programme in **MEDICAL LABOR**

ATORY TECHNOLOGY

(Sikkim Alpine University, Sikkim)

Semester IV

Sr. No.	Course Code	Name of the Course	Type of Course	Teaching Scheme			Evaluation Scheme		Credits	Total Marks
				L	T	P	IA	EA		
Theory										
1	BVMT-401	Genetics	Skill	4	0	0	40	60	4	100
2	BVMT-402	Virology, Mycology and Cytology	Skill	4	0	0	40	60	4	100
3	BVMT-403	Bio-Chemistry Metabolism	Gen	4	0	0	40	60	4	100
4	BVMT-404	Patho Genic Microbiology	Gen	2	0	0	20	30	2	50
5	BVMT-405	Basics of Accounting	Gen	2	0	0	20	30	2	50
6	BVMT-406	Computing Skill-II	Gen	2	0	0	30	30	2	50
Lab/ Practical/ Project										
1	BVMT-451	VOCATIONAL PRACTICAL OF GENETICS	Skill	0	0	2	20	30	2	50
2	BVMT-452	VOCATIONAL PRACTICAL OF VIROLOGY, MYCOLOGY & CYTOLOGY	Skill	0	0	3	40	60	3	100
3	BVMT-453	VOCATIONAL PRACTICAL OF BIO-CHEMISTRY METABOLISM	Skill	0	0	3	40	60	3	100
4	BVMT-454	VOCATIONAL PRACTICAL OF PATHO GENIC MICROBIOLOGY	Skill	0	0	2	20	30	2	50
5	BVMT-456	VOCATIONAL PRACTICAL OF COMPUTING SKILL-II	Skill	0	0	2	20	30	2	50
Total				18	0	12			30	800

Evaluation Scheme

B.Voc. Degree Programme in **MEDICAL LABORATORY TECHNOLOGY**

(Sikkim Alpine University, Sikkim)

Semester V

Sr. No.	Course Code	Name of the Course	Type of Course	Teaching Scheme			Evaluation Scheme		Credits	Total Marks
				L	T	P	IA	EA		
Theory										
1	BVMT-501	Molecular Biology - I	Skill	4	0	0	40	60	4	100
2	BVMT-502	Clinical Pathology-II	Skill	3	0	0	40	60	3	100
3	BVMT-503	Endocrinology-I, Tumor and Cancer Markers	Gen	3	0	0	40	60	3	100
4	BVMT-504	Advance Bio-Chemical Testing Techniques	Skill	3	0	0	40	60	3	100
5	BVMT-505	Digital literacy	Gen	4	0	0	40	60	4	100
6	BVMT-506	Introduction to National Healthcare System	Gen	3	0	0	40	60	3	100
Lab/ Practical/ Project										
1	BVMT-551	VOCATIONAL PRACTICAL OF MOLECULAR BIOLOGY-I	Skill	0	0	2	20	30	2	50
2	BVMT-552	VOCATIONAL PRACTICAL OF CLINICAL PATHOLOGY-II	Skill	0	0	2	20	30	2	50
3	BVMT-553	VOCATIONAL PRACTICAL OF ENDOCRINOLOGY-I, TUMOR AND CANCER MARKERS	Skill	0	0	2	20	30	2	50
4	BVMT-554	VOCATIONAL PRACTICAL OF ADVANCE BIO-CHEMICAL TESTING TECHNIQUES	Skill	0	0	2	20	30	2	50
5	BVMT-555	VOCATIONAL PRACTICAL OF DIGITAL LITERACY	Skill	0	0	2	20	30	2	50
Total				20	0	10			30	850

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Semester VI

Sr. No.	Course Code	Name of the Course	Type of Course	Teaching Scheme			Evaluation Scheme		Credits	Total Marks
				L	T	P	IA	EA		
Theory										
1	BVMT-601	Toxicology	Gen	4	0	0	40	60	4	100
2	BVMT-602	Endocrinology II and Molecular Biology II	Gen	4	0	0	40	60	4	100
3	BVMT-603	Entrepreneurship	Gen	3	0	0	40	60	3	100
Lab/ Practical/ Project										
1	BVMT-651	VOCATIONAL PRACTICAL OF TOXICOLOGY	Skill	0	0	2	20	30	2	50
2	BVMT-652	VOCATIONAL PRACTICAL OF ENDOCRINOLOGY-II & MOLECULAR BIOLOGY-II	Skill	0	0	2	20	30	2	50
2	BVMT-653	Project Work	Skill	-	-	18	200	400	18	600
Total				11	0	22			33	950

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Detailed Syllabus

Name of the Course: B. Voc. (MEDICAL LABORATORY TECHNOLOGY)

BVMT – 101-ANATOMY

UNIT-1

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

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

Lymphatic System: Lymph vessels, lymph nodes and lymphoid organs, their structure & functions.

UNIT-4

Digestive systems: Parts of gastrointestinal tract and associated glands.(names)

UNIT-5

Respiratory System: Parts of Respiratory System.(diagram ,Name, function)

BVMT-102- PHYSIOLOGY-I & LABORATORY BASICS-I

UNIT-1

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-2

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.

UNIT-3

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-4

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-5

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-6

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.

BVMT – 103 PHLEBOTOMY AND 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.

BVMT-104-INTRODUCTION TO 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.

BVMT -105-COMPUTING SKILLS

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

BVMT-106-FUNCTIONAL ENGLISH

Unit-1

1. The phonology of English - International Phonetic Alphabet [IPA]: consonants, vowels,

Diphthongs and Consonant Clusters. Places and manners of articulation of sounds.

Unit II

2. The syllable and stress patterns: strong and weak forms. Sentence-stress-pause.

3.Intonation: patterns of intonation and use of them for reading and speaking purposes

Unit-III

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

E) 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

1ST SEMESTER PRACTICALS

BVMT-151-ANATOMY

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.

BVMT-152- PHYSIOLOGY-I & LABORATORY BASICS-I

- 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
- Urine formation and execration
- 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
-

BVMT-153- PHLEBOTOMY & WASTE MANAGEMENT-I

- 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)

BVMT-154-INTRODUCTION TO 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.

BVMT-155-COMPUTING SKILLS

- 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).

2ND SEMESTER

BVMT-201-ANATOMY-II

UNIT-1

Glands of human body – mucous glands, thyroid gland, parathyroid gland, hypothalamus, pituitary, adrenal, pineal, the ovaries, the testes glands, general consideration of lymphatic system, gross anatomy of thoracic duct, histology of lymph node, spleen, tonsils and thymus, gross anatomy of respiratory system, parts of respiratory system, histology of trachea and lungs, parts of reproductive system- Male and female.

UNIT-2

Introduction and definition of integumentary system and Gastro- intestinal system, layers of skin, appendages of skin-hair, sebaceous gland, sweat gland, nails, receptors, function of skin, parts of GIT, oral cavity, salivary glands, structure and function of esophagus, stomach, small and large intestine, liver, gall bladder and pancreas, Histology of tongue, esophagus, stomach, small and large intestine, liver, gall bladder and pancreas.

UNIT-3

Nervous System: Parts of brain, spinal cord, peripheral nerves.(function)

BVMT-202- PHYSIOLOGY II & CLINICAL BIOCHEMISTRY-I

UNIT-1

Excretory Systems: Structure & function of kidney and urinary bladder. Mechanism of urine formation. disorders of kidney.

UNIT-2

Lymphatic system and immunity- Lymphoid tissue formation, composition and functions of lymph, phagocytosis, cytokine therapy, AIDS, autoimmune disease, medical uses of hemopoietic growth factors, organs of lymphatic system, functions of respiratory system, mechanism of respiration, lungs volume and capacities- definition, normal value, their measurement and clinical importance, pulmonary ventilation, diffusion of gasses, pulmonary circulation- oxygen and carbon dioxide transport in blood, disease related to respiratory system.

UNIT-3

Gastrointestinal system- characteristics of G.I, functions of G.I, hormones, saliva, composition, function, control of secretion, gastric juice- composition, mechanism of secretion, functions, regulation of secretion, mucosal barrier, pancreatic juice- composition, function, regulation, liver and gall bladder- composition, function of bile, control of secretion, functions of gall bladder and gallstone, functions of reproductive system – male and female, functions of urinary system-ureters, urinary bladder, urethra.

UNIT-4

Reproductive Systems: Physiology of reproductive organs.
Nervous System: Neurone & its function.

UNIT-5

Lab examination of body fluids : lab investigation of different body fluids- cerebrospinal fluid, synovial fluid, peritoneal fluid etc. Routine biochemical tests: creatinine kinase, blood gases, determination of serum or plasma bicarbonate. Electrolytes, phosphate etc.

UNIT-6

Bio chemical test profile: basic physiology and biochemistry of the human body, interrelated metabolic processes of the body, biochemical tests- liver tests, kidney function tests, endocrine function tests, lipid profile, LDH, CPK, CPK-MB, Amylase, GTT, GCT, blood sugar fasting ,pp and random.

UNIT-7

Analytical techniques: basic steps in analytical chemistry, electrochemistry, photometry, immune-chemistry, separation and analysis of organic compounds, principles of analytical chemistry, photometry, electrochemistry, immunochemistry.

UNIT-8

Biochemical processes: normal and abnormal biochemical process of the body, biochemical changes in the body under pathological conditions, functions of various organs and their clinical assessment.

BVMT-203- INTRODUCTION TO HAEMATOLOGY

UNIT-1

Blood: Composition and functions of blood, blood cells-RBC's, WBC's Platelet, serum, plasma, hemoglobin, haematopoietic systems of human body, human blood group system, body fluids, blood volume, homeostasis, stages of RBC's, WBC's and platelets.

UNIT-2

Haematological disorders and disorders: classification of anemia- morphology and etiological, iron deficiency anemia- distribution of iron in body, iron absorption, causes of iron deficiency, lab findings, megaloblastic anemia- causes and lab findings, hemolytic anemia- causes and lab findings, thalessemia, HDN, multiple myeloma, polycythemia, parasitic infection of blood.

UNIT-3

Bone Marrow: cell composition of normal adult bone marrow, aspiration, indication, preparation and staining, special stain for bone marrow- periodic Acid Schiff, Sudan black, myeloperoxidase, leukemia- classification, blood picture, differentiation of blast cells.

UNIT-4

Coagulopathies and bleeding disorder: bleeding disorders, haemostasis, mechanism of coagulation, clotting or coagulation factors, routine coagulation tests- prothrombin time, activated partial thromboplastin time, bleeding time, clotting time, Clot retraction time, laboratory diagnosis of bleeding disorder.

BVMT-204- LABORATORY BASICS-II & WASTE MANAGEMENT-II

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 behavior in healthcare setting: Learn to maintain restful environment, general and specific etiquettes, legal and ethical issues, impact of comfort on patients health, importance and methodology of cleanliness, and hygiene environment in collection, acquire elementary knowledge on good clinical laboratory practices of WHO.

BVMT-205- ADVANCE PHLEBOTOMY & LAB ETHICS

UNIT-1

Specimen Collection (blood vacutainer method) , urine ,sputum, stool etc.) : characteristics if good phlebotomist, preparation of specimen collection, basics steps for drawing of blood specimen by vein puncture, complications of vein puncture, specimen rejection criteria for blood specimen, hemolysis of blood, blood collection by skin puncture (capillary puncture) arterial puncture.

UNIT-2

Phlebotomy: order of draw for specimen collection, types of anticoagulant, types of vaccutainers, separation of serum and plasma, difference between serum and plasma, maintenance of specimen identification, transport of specimen, effect of storage on blood cell morphology, universal precautions.

UNIT-3

Lab ethics: maintaining equipments, awareness of requisition form, specimen rejection record, data management, ethical consideration, train the technician, standard operating procedures, calibration, quality control.

BVMT-206-BASIC OF HEALTH MARKET AND ECONOMY

Unit 1

Health Care Market An Introduction : Main Problems in the Market for Health Care, Health Care and Economic Basics, Analyzing Health Care Markets. Demand-Side Considerations: Demand for Health and Health Care, Market for Health Insurance

UNIT-2

Supply-Side Considerations: Managed Care, Health Care Professionals, Hospital Services, Confounding Factors Public Policy in Medical Care: Policies to Enhance Access, Policies to Contain Costs, Medical Care Systems Worldwide,

UNIT-3

Health Sector in India: An Overview Health Outcomes; Health Systems; Health Financing Evaluation of Health Programs Costing, Cost Effectiveness and Cost-Benefit Analysis; Burden of Diseases ,Role of WHO , Health Care Budget: purpose, types & practices in Indian context.

UNIT-4

Health Economics: Fundamentals of Economics: Scope & coverage of Health Economics, demand for Health Sciences; Health as an investment, population, Health &Economic Development. Tools of Economics-Concepts of need, demand, supply & price in Health Services. Methods & amp; Techniques of Economic Evaluation of Health Programmes: Cost benefit & cost effective methods-output & input analysis. Market, monopoly, perfect & imperfect competition. Health Financing from various sources – Public , Private, TPA.
Economics of Health Programmes for Nutrition, diet & population control, economics of abuse of tobacco & alcohol, environmental influences on health and feeding. Economics of Communicable (STDs & Malaria) & non-communicable (IHD & Cancers) diseases.

2ND SEMESTER PRACTICAL

BVMT-251-ANATOMY-II

Human Anatomy-II (Practical)

Demonstration of:

- Nervous system from models.
- Structure of eye and ear
- Structural differences between skeletal, smooth and cardiac muscles.
- Various bones
- Various joints
- Various parts of male & female reproductive system from models

BVMT-252- PHYSIOLOGY II & CLINICAL BIOCHEMISTRY-I

- To perform total platelet count.
- To perform bleeding time.
- To perform clotting time.
- To study about CSF examination.
- To study about intrauterine contraceptive devices.
- To demonstrate microscopic structure of bones with permanent slides.
- To demonstrate microscopic structure of muscles with permanent slides.

- Analysis of Normal Urine
- Liver Function tests
- Lipid Profile
- Renal Function test
- Blood gas and Electrolytes
- Demonstration of Glucometer with strips

BVMT-253- INTRODUCTION TO HAEMATOLOGY

- Study sickling test using 2% sodium meta bisulphite
- Determination of reticulocyte count.
- Determination of prothrombin time
- Determination of glucose-6-phosphate dehydrogenase(G-6-PD)

BVMT-254-ADVANCE PHLEBOTOMY AND LAB ETHICS

- To learn general laboratory safety rules.
- To demonstrate glasswares, apparatus and plasticwares used in laboratory.
- To demonstrate method of blood collection.
- To separate serum and plasma.
- To demostrate quality control in lab
- To learn sampling

BVMT-255- LABORATORY BASICS-II & WASTE MANAGEMENT-II

- 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 refractormeter
- 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

3RD SEMESTER

BVMT-301- BACTERIOLOGY & CLINICAL BIOCHEMISTRY-II

UNIT-1

Bacteriology-1:Gram positive bacteria- streptococcus, bacillus, mycobacterium, corneybacterium etc.

UNIT-2

Bacteriology-2 Gram negative bacteria- E-coli, klebsiella, salmonella, shigella, vibrio, psedumonas etc.

UNIT-3

Diagnostic and systemic bacteriology-1: staphyloccus, streptococcus, spirochaetes, mycoplasma, rickettsiae etc, systemic grouping of pathogenic bacteria, laboratory investigation of infectious agent.

UNIT-4

Diagnostic and systemic bacteriology-2: Diagnosis of anaerobic infections, identifying characteristics if common pathogenic bacteria, antimicrobial susceptibility test, IMViC, urease, catalase, geletine liquification, coagulase, oxidase, sugar fermentation, antibiotic sensitivity test.

- Renal Function Tests
- Chemical Tests in Renal Disease
- Gastric Function Tests
- Liver Function Tests
- Cardiac Profile Tests
- Acid base balance concepts & disorders
- Phosphorylation
- Enzymes
- Vitamins
- Milk & Composition of Milk
- Interpretative Clinical Chemistry

BVMT-302-HAEMATOLOGY AND IMMUNOLOGY-I

- Details of Introduction to Haematology
- Details of Haematological Diseases
- Details of Haemostasis, Coagulation and Routine Coagulation Tests
- Details of Immunology
- Details of Clinical Immunology
- Details of Factors influencing
- Details of Immunological Reactions & Related Terms
- Details of Antibodies & Immunoglobulin Classes
- Details of Role of Antibodies in Diagnostic Applications
- Details of Research Applications of Antibodies
- Details of Antigen-Antibody Interactions

BVMT –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.

BVMT-304 – HEALTH AND WELLNESS

UNIT 1

Personal Health, Nutrition, and Fitness, Your Lifestyle and Your Health, Your Role in Maintaining Your Health, Guidelines for a Healthy Diet, Dietary Guidelines and Nutritional Facts, Nutrition and Chronic Diseases, Individual Caloric and Nutritional Needs, Benefits of Physical Activity

UNIT 2

Preventing Disease and Injury, Immunity and Preventing Disease, Lifesaving and Emergency Care Procedures, Strategies for Preventing Accidents

UNIT 3

Growth, Development, and Sexuality, Human Reproduction and Development, Benefits of Healthy Sexual Practices, Peer Pressure and Sexual Activity, Family Planning Strategies

UNIT 4

Substance Abuse, Health Effects of Using Alcohol, Tobacco, and Other Drugs, Harmful Effects of Dietary Supplements and Anabolic Steroids, Effects of Medicines and Illegal Substances, Peer Pressure Substance Abuse

BVMT-305-COMMUNICATION SKILLS

UNIT-1

a) Application writing
b) Paragraph writing, essay writing and précis writing
c) Pre-testing of oral and writing skills

UNIT-2
Professional Skills
a) Bio-data, CV and resume writing
b) Joining letter, cover letter and resignation letter
c) Inter- office memo, formal Business letter, informal notes
d) Minutes of the meeting, reporting events, summary writing

UNIT-3
Presentation skills
a) Power-point presentations and presenting techniques
b) Body language
c) Describing people, places and events
d) Extempore, speech and just- a minute sessions

UNIT-4
Interview skills
a) Developing skills to- debate, discussion, basics of GD and styles of GD
b) Discussion in groups and group discussion on current issues
c) Steps to prepare for an interview and mock interviews
Public speaking
a) Art of public speaking
b) Welcome speech
c) Farewell speech
d) Votes of thanks
Oral practice
a) Debate
b) Just-a-minute
c) Group discussion
d) Mock interviews

BVMT-306-FINANCIAL LITERACY

Company Final Accounts

- Books of Account.
- Introduction to Company Final Accounts.
- Formats of Financial Statements: Schedule III (Companies Act 2013).
- Familiarity with the Items of Financial Statements. (Preparation of Company Financial Statements is not required).

Financial Statements: Analysis and Interpretation

- Meaning and Types of Financial Statements.
- Nature of Financial Statements.
- Limitations of Financial Statements.
- Analysis and Interpretation of Financial Statements.
- Steps involved in the Financial Statement Analysis.
- Methodical Classification.
- Ratio Analysis.
- Advantages of Ratio Analysis.
- Limitations of Ratio Analysis.

Funds Flow Statement

- Meaning of Funds Flow Statement.
- Uses of Funds Flow Statement.
- Funds Flow Statement vs Income Statement.
- Treatment of Provision for Taxation and Proposed Dividends.

Cash Flow Statement

- Meaning of Cash Flow Statement.
- Uses of Funds Flow Statement.
- Treatment of Provision for Taxation and Proposed Dividends

3RD SEMESTER PRACTICAL

BVMT-351- BACTERIOLOGY & CLINICAL BIOCHEMISTRY-II

- Staining
- Grams staining
- ZN staining
- Alberts staining
- Hanging drop preparation
- Culture methods
- Introduction to biochemical reactions
- Identification of bacterial culture
- Colony characteristics
- Morphological characteristics
- Motility study
- Interpretation of biochemical reactions
- Antibiotic sensitivity testing- Kirby Bauer method
- Applied bacteriology- exercise
- Immunology: Serological tests:
- Specimen collection Principle, Methods,Procedure
- Normal values/ significant titer
- Interpretations
- Limitations: of all the following tests
- Widal
- ASO
- CRP
- RPR/VDRL/TRUST
- RA
- HBsAg /anti HIV detection
- ELISA

BVMT-352- HAEMATOLOGY AND IMMUNOLOGY-I

- Describe Haematology
- Describe of Haematological Diseases
- Describe Haemostasis, Coagulation and Routine Coagulation Tests
- Describe Immunology
- Describe Clinical Immunology
- Describe Factors influencing
- Describe Immunological Reactions & Related Terms
- Describe Antibodies & Immunoglobulin Classes
- Describe Role of Antibodies in Diagnostic Applications
- Describe Research Applications of Antibodies
- Describe -Antibody Interactions

BVMT-353- 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.

4TH SEMESTER

BVMT-401- GENETICS

UNIT-1

Recombinant DNA Technology: Genetic engineering and gene cloning in microorganisms, strategies of genetic engineering, restriction enzymes, vectors, plasmids, genetic engineering for human welfare- 1) production of pharmaceuticals 2) insects pest control 3) use of genetically engineered microorganisms for control of pollution.

UNIT-2

Genetics: Genetics disorder, karyotyping, electrophoresis and hybridization techniques, introduction to medical genetics, structure of RNA and DNA, genetics of common diseases, CLIA techniques. Gene mutation, gene theraphy, chromosome mapping, mendelian genetics.

BVMT-402- VIROLOGY, MYCOLOGY AND CYTOLOGY

- Introduction to Virus
- Virus Classification
- General Characteristics common to Virus
- Cultivation of Viruses
- Reaction to Physical & Chemical Agents
- Methods of Inactivation of Viruses
- DNA containing Viruses
- RNA containing Viruses
- General Transmission Routes for Viruses
- Interferons
- Laboratory Diagnosis of all Important Viruses
- Clinical Mycology
- Cytological Techniques

BVMT-403-BIOCHEMISTRY METABOLISM

UNIT-1

Digestion and Absorption of Carbohydrates : Metabolic pathways of carbohydrates, glycolysis and alcoholic fermentation, pentose phosphate pathway, glucuronate, glycoxylate pathway TCA cycle, glycogenesis, glyconeogenesis, biosynthesis, of starch and ascorbic acid.

UNIT-2

Digestion and transport of lipid: oxidation of fatty acids, degradation of triglycerides and phospholipids. Formation and utilization of ketone bodies. Biosynthesis of saturated and unsaturated fatty acids. Biosynthesis of triglycerides and phospholipids, biosynthesis of cholesterol. Biosynthesis of prostaglandins, lipoxins, prostacyclins.

UNIT-3

Digestion of protein: General reactions of amino acids, deamination, transaminaion and decarboxylation. Urea cycle, catabolism of carbon skeletons of amino acids, Glycine and alanine, serine and threonine, phenylalanine and tyrosine, tryptophan, histidine, leucine, cysteine, and methionine, lysine, glutamic acid and glutamine, aspartic acid, asparagines. Biosynthesis of nutritionally non essential amino acids.

Glutamate, and glutamine, aspartate, asparagines, proline, alanine, cysteine, tyrosine, serine, Glycine.

UNIT-4

Digestion of Nucleic Acids: Degradation of purines and pyrimidines, biosynthesis of purines, pyrimidines and nucleotides. Catabolism of heme and formation of bile pigments. Biosynthesis of porphrins and heme. Conjugation of bilirubin and its clinical significance.

BVMT-404-PATHO GENIC MICROBIOLOGY

UNIT-1

Infectious disease: Brief introduction to terminology of infectious diseases, frequency of disease, recognition of infectious diseases, infections, disease cycle, virulence and mode of transmission, emerging and re-emerging infectious diseases, global travel and health considerations, nosocomial infections.

UNIT-2

Microbes of medical importance: nomenclature and classification of microbes of medical importance. Origin of normal flora, distribution and occurrence of normal flora of skin, eyes, respiratory tract, mouth, intestinal tract and urinary tract.

UNIT-3

Mode of microbial infections: microbial adherence, passive penetration into body, active penetration into body, events in infection following penetration, microbial virulence factors.

UNIT-4

Antimicrobial Drugs: Development of chemotherapy, general characteristics of antimicrobial drugs, determination level of antimicrobial activity, mechanisms of action of antimicrobial agents, factors influencing the effectiveness of antimicrobial drugs, antimicrobial drugs example sulfonamides, quinolones, penicillins, cephalosporins, tetracyclines, erythromicin, chloramphenicol, drug resistance, antifungal and antiviral drugs.

BVMT-405- BASICS OF ACCOUNTING

UNIT-1

Introduction to Accounting :Need for Accounting – Definition – Objectives, Advantages – Book keeping and Accounting–Accounting concepts and conventions - Accounting Cycle - Classification of Accounts and its rules - Double Entry System - Journalization - Posting to Ledgers, Balancing of ledger Accounts (Simple problems).

UNIT –2

Subsidiary Books: Types of Subsidiary Books - Cash Book, Three-column Cash Book- Petty cash Book (Simple Problems).

UNIT-3

Bank Reconciliation Statement:Need for bank reconciliation - Reasons for difference between Cash Book and Pass Book Balances- Preparation of Bank Reconciliation Statement- Problems on both favorable and unfavorable balances (Simple Problems).

UNIT-4

Trail Balance and Rectification of Errors:Preparation of Trail balance - Errors – Meaning – Types of Errors – Rectification of Errors (Simple Problems).

UNIT -5

Final Accounts: Preparation of Final Accounts: Trading account – Profit and Loss account – Balance Sheet – Final Accounts with adjustments (Simple Problems).

BVMT-406-COMPUTING SKILLS-II

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.

4TH SEMESTER PRACTICAL

BVMT-401-GENETICS

- To perform separation of amino acids by paper chromatography
- To perform separation of amino acids by thin layer chromatography
- To perform separation of DNA by Agarose gel electrophoresis.
- Separation of protein by PAGE
- Separation of protein by paper electrophoresis
- Isolation of DNA
- Separation of DNA by Agarose gel electrophoresis
- Demonstration of thermal cycler and PCR.
- Demonstration of PCR HLA B-27
- Demonstration of PCR HIV
- Demonstration of PCR MTB

BVMT-452-VIROLOGY, MYCOLOGY AND CYTOLOGY

- Describe Virus
- Describe Virus Classification
- Describe General Characteristics common to Virus
- Describe Cultivation of Viruses
- Describe Reaction to Physical & Chemical Agents
- Describe Methods of Inactivation of Viruses
- Describe DNA containing Viruses
- Describe RNA containing Viruses
- Describe General Transmission Routes for Viruses
- Describe Interferons
- Describe Laboratory Diagnosis of all Important Viruses
- Describe Mycology
- Describe Parasitic Fungi
- Describe Laboratory Diagnosis of Mycotic Infections
- Describe Laboratory Culture
- Describe Detection and Identification of Fungi by PCR Technology
- Describe Differentiation between Normal and Abnormal Cells
- Describe Sampling Techniques in Cytology
- Describe Various types of Specimens and Requirements for Cytological Studies
- Describe Various Cytological Tests
- Describe Fixation of Cytological Smears
- Describe Importance of Cyto-Centrifuge in Cytology
- Describe Liquid Based Cytology (LBC)

BVMT-453-BIO-CHEMISTRY METABOLISM

- Colorimetric estimation of inorganic phosphate.
- Estimation of Lipoproteins in plasma
- Estimation of proteins by Lowry's method.
- Estimation of total lipids in serum by Vanillin method.
- Estimation of total and free cholesterol in serum.
- Estimation of Ca+ in serum
- Estimation of blood glucose by the methods of (i) Folin
- Wu (ii) Nelson Somogyi.
- Isolation and assay of glycogen from rat liver.
-

BVMT-454-PATHOGENIC MICROBIOLOGY

- Identification of both gram positive and gram negative microorganisms on the basis of :

  (i) Morphology.

- Bio-chemical characteristics.
- Serological reactions.
- Demonstration of pathogens (Viruses, fungi, parasites) in permanent mounted slides.
- Demonstration of cysts/ovas of protozoa/Helminths.
- Demonstration of Laboratory grown fungi on sabauraud's agar.
- Germ tube test for candida albicans
- Demonstration of fungi through normal saline/KOH preparation.

BVMT-455-COMPUTING SKILLS-II

- 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.

5th SEMESTER

BVMT-501-MOLECULAR BIOLOGY

- Details of Tumour & Cancer Markers
- Details of Characteristic Features of Cancer
- Details of Pathophysiology of Cancer
- Details of the Carcinogens
- Details of Characteristics of Growing Tumour Cells
- Details of Muti-step process of Cancer
- Details of Tumor Markers
- Details of Laboratory Experiments
- Details of Cytogenetics & Important definitions
- Details of Normal Chromosome structure
- Details of Important aspects of Cytogenetic Studies
- Details of Use of Cell culture for Cytogenetic studies
- Details of General Method of Preparation of Cell culture
- Details of Study of Constitutional Chromosome Patterns
- Details of FISH Technique
- Details of Genetic Disorders and Inborn errors of Metabolism
- Details of Clinical Cytogenic Testing (CCT)
- Details of Radioammuno Assay
- Details of Chemiluminiscent Assay

BVMT-502-CLINICAL PATHOLOGY-II

- Pathology of Blood Vessels and Lymphatics
- Pathology of Heart
- Pathology of Respiratory System
- Pathology of the Eye, ENT and Neck
- Pathology of Oral Cavity and Salivary Glands
- Pathology of the Gastrointestinal Tract
- Pathology of the Liver, Biliary Tract and Exocrine Pancreas
- Pathology of the Kidney and Lower Urinary Tract
- Pathology of the Male Reproductive System and Prostate
- Pathology of the Female Genital Tract
- Pathology of the Breast
- Pathology of the Skin
- Pathology of Endocrine System
- Pathology of the Musculoskeletal System
- Pathology of Soft Tissue Tumours
- Pathology of the Nervous System

BVMT-503-ENDOCRINOLOGY-I, TUMOR AND CANCER MARKERS

UNIT-1

Endocrinology-1: introduction, difference between hormones and enzymes, regulation and general mechanism of action of hormones, pituitary glands and hypothalamus, hormones of pituitary gland- growth hormone, prolactin, gonadotropin, follicle stimulating hormone, leutinizing hormone, thyroid stimulating hormone, adrenocorticotrophic hormone, oxytocin, ADH, hormones of the thyroid gland, thyroid disorder.

UNIT-2

Endocrinology-2: Adrenocortical hormones- synthesis, and secretion, aldosterone and its function, cortosol and its function, cushing's syndrome, Conn's syndrome, adrenal medulla- metabolism, hormones of the gonads- testosterone, estrogen, progesterone their synthesis and functions, HCG hormone, menstrual cycle, menopause, hormones of pancreas- insulin- its metabolic effects on carbohydrates, fats and proteins, control of insulin secretion, glucagon- functions, metabolic effects, blood glucose regulation, diabetes mellitus, somatostatin, hormones of kidney –rennin.

UNIT-3

Tumor and cancer marker-1: Introduction, the carcinogens- definition, oncogene- definition, mechanism of action, characteristics of growing tumor cells- general, morphological, biochemical changes, Tumor Markers- introduction and definition, clinical classification of tumor markers, enzymes as tumor markers, alkaline phosphatase, creatine phosphatase, lactate dehydrogenase, prostatic acid phosphatase, prostate specific antigens(PSA).

UNIT-4

Tumor and cancer marker-2: Hormones as tumor markers (introduction of each type in brief), oncofetal antigens, alpha feto protein, carcino embryonic antigen, squamous cell carcinoma antigen, carbohydrate markers (brief introduction of each type), CA-125, blood group antigen, bladder cancer markers, FDP, nuclear matrix protein.

BVMT-504-ADVANCE BIOCHEMICAL TESTING TECHNIQUES

UNIT-1

Chromatography: Separation and identification of amino acids by paper chromatography and thin layer chromatography.

UNIT-2

Phospholipids: separation of phospholipids by thin layer chromatography.

UNIT-3

Lactic acid: Estimation of lactic acid in blood before and after exercise.

UNIT-4

Starch: Preparation of starch from potato and its hydrolysis by salivary amylase

BVMT-505-DIGITAL LITERACY

Unit 1:

Review of MS office

Advance options in MS excel

Excel

Power point

Introduction to internet learning platform

Using internet-based learning platform

Using google and you tube for learning

Using smart phone to become smart

UNIT-2

Benefits of digital learning

Using internet for personal requirement

Online payments method

Use of social media for advisement

Digital security and privacy

Various cybercrime and their safety guideline

Best practice for securing online and network transaction

Managing privacy and security and social media accounts

BVMT-506-INTRODUCTION TO NATIONAL HEALTHCARE SYSTEM

UNIT-1

1. Introduction to healthcare delivery system

a. Healthcare delivery system in India at primary, secondary and tertiary care

b. Community participation in healthcare delivery system

c. Health system in developed countries.

d. Private Sector

e. National Health Mission

f. National Health Policy

g. Issues in Health Care Delivery System in India

UNIT-2

2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.

UNIT-3

3. Introduction to AYUSH system of medicine

a. Introduction to Ayurveda.

b. Yoga and Naturopathy

c. Unani

d. Siddha

e. Homeopathy

f. Need for integration of various system of medicine

UNIT-4

4. Health scenario of India- past, present and future Demography & Vital Statistics-

a. Demography – its concept

b. Vital events of life & its impact on demography

c. Significance and recording of vital statistics

d. Census & its impact on health policy

6. Epidemiology

a. Principles of Epidemiology

b. Natural History of disease

c. Methods of Epidemiological studies

d. Epidemiology of communicable & non-communicable diseases, disease transmission, host defence immunizing agents, cold chain, immunization, disease monitoring and surveillance.

5TH SEMESTER PRACTICAL

BVMT-551-MOLECULAR BIOLOGY

- Describe Tumor & Cancer Markers
- Describe Characteristic Features of Cancer
- Describe Pathophysiology of Cancer
- Describe Carcinogens
- Describe Characteristics of Growing Tumor Cells
- Describe Muti-step process of Cancer
- Describe Tumor Markers
- Describe Laboratory Experiments
- Describe Cytogenetics & Important definitions
- Describe Normal Chromosome structure
- Describe Use of Cell culture for Cytogenetic studies
- Describe General Method of Preparation of Cell culture
- Discuss Study of Constitutional Chromosome Patterns
- Describe FISH Technique
- Describe Genetic Disorders and Inborn errors of Metabolism
- Describe Clinical Cytogenic Testing (CCT)
- Describe Radioammuno Assay Test
- Describe Chemiluminiscent Assay Test

BVMT-552-CLINICAL PATHOLOGY-II

- Describe Pathological Conditions of Blood Vessels and Lymphatics
- Describe Pathological Conditions of Heart
- Describe Pathological Conditions of Respiratory System
- Describe Pathological Conditions of the Eye, ENT and Neck
- Describe Pathological Conditions of Oral Cavity and Salivary Glands
- Describe Pathological Conditions of the Gastrointestinal Tract
- Describe Pathological Conditions of the Liver, Biliary Tract and Exocrine Pancreas
- Describe Pathological Conditions of the Kidney and Lower Urinary Tract
- Describe Pathological Conditions of the Male Reproductive System
- Describe Pathological Conditions of the Female Genital Tract
- Describe Pathological Conditions of the Breast
- Describe Pathological Conditions of the Skin
- Describe Pathological Conditions of Endocrine System
- Describe Pathological Conditions of the Musculoskeletal System
- Describe Pathological Conditions of Soft Tissue Tumours
- Describe Pathological Conditions of the Nervous System

BVMT-553-ENDOCRINOLOGY – I, TUMOR AND CANCER MARKER

1. To determine T3 conc. in serum sample.

2. To determine T4 conc. in serum sample.

3. To determine TSH conc. in serum sample.

4. To determine LH conc. in serum sample.

5. To determine FSH conc. in serum sample.

6. To determine Prolactin conc. in serum sample.

7. To determine TSH conc. in serum sample.

8. To perform TRIPLE test.

9. Beta HCG

BVMT-554- ADVANCE BIO-CHEMICAL TESTING TECHNIQUES

- Chromatography technique
- Paper Chromatography, Thin layer chromatography, HPLC, Gas liquid chromatography, Ion exchange chromatography
- Phospholipids differenciation
- Lactic acid formation
- Starch formation

BVMT-555-DIGITAL LITERACY

- Uses Advance options in MS excel
- Excel
- Power point
- Using internet-based learning platform
- Using google and you tube for learning
- Using smart phone to become smart
- Using internet for personal requirement
- Online payments method
- Use of social media for advisement

6TH SEMESTER

BVMT-601-TOXICOLOGY

- Details of Toxicology—Toxicokinetics & Toxicodynamics
- Details of Relationship between Drug usage and Intensity of its Effect
- Details of Metabolism and Excretion of Drugs
- Details of Monitoring Individual Drug Concentration
- Details of Drug assay Techniques
- Details of Laboratory Experiments
- Details of Therapeutic and Toxic Levels of Drugs
- Details of Routine Examination of Cerebrospinal Fluid
- Details of Routine Examination of Cavity Fluids
- Details of Routine Examination of Gastric Contents
- Details of Routine Examination of Sputum
- Details of Routine Examination of Semen

BVMT-602-ENDOCRINOLOGY-II AND MOLECULAR BIOLOGY-II

- Describe Hormones of the Gonads
- Describe Clinical Chemistry of Menstrual Cycle
- Describe Clinical Chemistry of Pregnancy
- Describe Disorders of Male Gonadal function
- Describe Gynecomastia
- Describe Disorders of Female Gonadal function
- Describe Amenorrhoea
- Describe Climacteric hirsutism and virilisum
- Describe Other hormones
- Describe Laboratory Tests
- Describe Prenatal Cytogenetics
- Describe Postnatal Cytogenetics
- Describe Chromosomal aneuploidy syndromes
- Describe Prenatal chromosomal Diagnosis
- Describe Laboratory Experiments
- Describe Molecular Diagnosis of Genetic Diseases
- Describe Forensic Identity Testing
- Describe Parentage Testing
- Describe about Prenatal & Postnatal Cytogenetics
- Describe about Laboratory Diagnosis of Hemopoeitic Neoplasms using Molecular Techniques
- Describe about Laboratory Diagnosis of Lymphomas using Molecular Techniques

BVMT-603-ENTREPRENEURSHIP

Entrepreneurship: Concept and Functions

Unit 2 An Entrepreneur

Unit 3 Entrepreneurial Journey

Unit 4 Entrepreneurship as Innovation and

Unit 5 Understanding the Market

Unit 6 Business Finance and Arithmetic

Unit 7 Resource Mobilization

6TH SEMESTER PRACTICAL

BVMT-651-TOXICOLOGY

- Describe Toxicology—Toxicokinetic & Toxicodynamic
- Describe Relationship between Drug usage and Intensity of its Effect
- Describe Metabolism and Excretion of Drugs
- Describe Monitoring Individual Drug Concentration
- Described rug assay Techniques
- Describe Laboratory Experiments
- Describe Therapeutic and Toxic Levels of Drugs
- Describe Routine Examination of Cerebrospinal Fluid
- Describe Routine Examination of Cavity Fluids
- Describe Routine Examination of Gastric Contents
- Describe Routine Examination of Sputum
- Describe Routine Examination of Semen

BVMT-652- ENDOCRINOLOGY-II AND MOLECULAR BIOLOGY-II

Endocrinology-2

o Hormones of the Gonads

o Clinical Chemistry of Menstrual Cycle

o Clinical Chemistry of Pregnancy

o Disorders of Male Gonadal function

Ø Gynecomastia

o Disorders of Female Gonadal function

Ø Amenorrhoea

Ø The Climacteric

Ø Hirsutism and Virilisum

o Other Hormones

o Laboratory Tests

· Cytogenetics-2

o Prenatal & Postnatal Cytogenetics

o Chromosomal Abnormalities

o Forensic Identity Testing

o Parentage Testing