

SAURASHTRA UNIVERSITY

RAJKOT – INDIA



**Re-Accredited
Grade B by NAAC
(CGPA 2.93)**

CURRICULUM FOR

UGC - B.Voc. Under National Skills Qualification Framework (NSQF)

Bachelor of Vocational – Medical Laboratory and Molecular

Diagnostics Technology

(B. Voc.- MLMDT)

(Sanctioned by UGC vide letter no. D.O.No. F.2-2/2014 (B.Voc.) Dt. 5-5-2014
to Shree Manibhai Virani & Smt. Navalben Virani Science College-Rajkot)

(Semester I and Semester II)

Effective From June – 2014

Bachelor of Vocational – Medical Laboratory and Molecular Diagnostics Technology
(Semester – I & II)
Saurashtra University
Effective from June - 2014

Bachelor of Vocational – Medical Laboratory and Molecular Diagnostics Technology

(3 years – Six Semester Full Time Course)

Ordinance, Regulations and Examination Scheme:

O.S. B. Voc.- MLMDT – 1:

Candidate for admission to the Bachelor of Vocational – **Medical Laboratory and Molecular Diagnostics Technology** (B. Voc.-MLMDT.) must have passed standard 12th or equivalent examination from Gujarat higher secondary board or any other board.

O.S. B. Voc.- MLMDT – 2:

The duration of the course will be of three full time academic years. The examination for the Bachelor of Vocational – **Medical Laboratory and Molecular Diagnostics Technology** (B. Voc.-MLMDT.) course will be divided into six semesters.

Multi-level Exit: Candidate will be eligible to receive Diploma after first 2 semesters and Advance Diploma after 4 semesters according to guidelines of UGC. No candidate will be allowed to join any other course or service simultaneously.

O.S. B. Voc.- MLMDT. – 3:

Candidate who have passed an equivalent examination from any other board or examining body and is seeking admission to the Bachelor of Vocational – **Medical Laboratory and Molecular Diagnostics Technology** (B. Voc.-MLMDT) course will be required to provide necessary eligibility certificate.

O.S. B. Voc.- MLMDT. – 4:

No candidate will be admitted to any semester examination for Bachelor of Vocational – **Medical Laboratory and Molecular Diagnostics Technology** (B. Voc.-MLMDT) unless a student has put on at least 85% of the total lecture periods and practical periods in each subject in each semester

O.S. B. Voc.- MLMDT – 5 :

No candidate will be permitted to reappear at any semester examination, which he has already passed. The marks of successfully completed paper will be carrying forwarded for the award of class.

O.S. B. Voc.-MLMDT – 6:

There shall be an examination at the end of each semester to be known as Pre Diploma (first semester) examination, Diploma (second semester) examination, Pre Advanced Diploma (third semester) examination, Advanced Diploma (forth semester) examination, Pre B.Voc. Degree (fifth semester) examination and B. Voc Degree (sixth semester) examination at which a student shall appear in that portion of theory papers, practical and viva – voice if any, for which he has kept the semester in accordance with the regulations in this behalf.

A candidate whose term is not granted for what so ever reason shall be required to keep attendance for that semester or term when the relevant papers are actually taken at the college.

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O.S. B. Voc.-MLMDT – 8:

Guidelines to keep term of B. Voc. MLMDT

A candidate will be permitted to continue his/her study up to the 4th semester examination without passing his/her previous semester examination.

A candidate can take admission to fifth (pen-ultimate) semester if he/she is failing in NOT more than two subjects of previous (1 to 4) semesters.

A candidate can take admission to Sixth (Ultimate Final) Semester if he/she is not failing in more than two subjects of 5th Semester. Provided he/she should have cleared all 1 to 4 semester.

O.S. B. Voc.-MLMDT-9:

Standard of Passing

The standard of passing for Bachelor of Vocational – **Medical Laboratory and Molecular Diagnostics Technology** (B. Voc.-MLMDT) degree examination will be as under:

- 1) To pass any semester examination of the Bachelor of Vocational – **Medical Laboratory and Molecular Diagnostics Technology** (B. Voc.-MLMDT) degree, a candidate must obtain at least 40% marks in the university examination separately in each course of theory and practical.
- 2) Total marks of each theory paper are 100 (University examination 70 marks + Internal examination 30 marks)
- 3) Total marks of each practical and project-viva paper are 100. No internal examination marks in practical and project-viva papers.
- 4) Those of the successful candidates who obtain 50% or more marks in the aggregate of all the semester taken together will be placed in the **second class** and those who obtain 60% or more marks in the aggregate of all the semester taken together will be placed in the **first class**. The successful candidates who obtain 70% or more marks in the aggregate of all the semester taken together will be declared to have passed the examination in the **first class with distinction**.
- 5) A result of candidate who have obtained admission directly in Bachelor of Vocational – **Medical Laboratory and Molecular Diagnostics Technology** (B. Voc.-MLMDT) semester – III will be declared by considering his marks of semester III to VI in aggregate and accordingly class will be awarded as per normal percentage of marks fixed for other candidate.

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B. Voc. - Medical Laboratory and Molecular Diagnostics Technology (Semester – I)

Sr. No.	Paper No.	Subject Name	Component	Credit
1	MLMDT 1.1	Fundamentals of Anatomy and Physiology	Skill	5
2	MLMDT 1.2	General Pathology	Skill	5
3	MLMDT 1.3	Basics of Biochemistry, Instrumentation and reagents	Skill	5
4	MLMDT 1.4	Practical	Skill	12
5	GMLMDT 1.5	Functional English and Communication Skills	General education	3
Total Credits of Semester - I				30

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MLMDT 1.1: Fundamentals of Anatomy and physiology				
No.	Topics	Details	Marks	Min. Lec.
1	Body as a whole and its constituents	The cells, tissues and organization of the body Tissues- epithelial, connective, muscle, nervous Cell regeneration, membranes, glands Organization of the body Bones of the skeleton, Axial skeleton, Appendicular skeleton Cavities of the body Cranial, thoracic, abdominal, pelvic		4
2	Blood	Composition of blood Erythrocytes-Structure and functions Leucocytes-Types, Structure and functions Platelets- Structure and functions, Hemostasis		5
3	Cardiovascular system	Heart-Functional anatomy Properties of heart muscle Heart as a pump Cardiac output and venous return Vascular system Systemic arterial blood pressure		7
4	Respiratory system	Functional anatomy Ventilation and its control Exchange of gases Applied and environmental physiology		6
5	Digestive system	Elementary functional anatomy Salivary glands Stomach and its secretion Liver, pancreas and their role in digestion Bile, Small and large intestine Movement of alimentary tract Gastrointestinal hormones and their functions		7
6	Excretory system	Functional anatomy of kidney Mechanism of formation of urine Water, electrolyte and acid-base balance Skin and its functions		6

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7	Nervous system	Elementary neuroanatomy Properties of neurons Nerve impulse, Types of nerves Synapse and chemical transmitters Central nervous system-Neuroglia, membranes of brain and spinal cord, Ventricles of brain and cerebrospinal fluid Brain- cerebrum, cerebellum Spinal cord- structure Peripheral nervous system-Spinal nerves and cranial nerves Autonomic nervous system-Sympathetic NS Parasympathetic NS Functions of ANS Central visceral regulations		7
8	Special senses and overview of endocrine system	Ear and hearing Structure and physiology of hearing Eyes and sight Structure and physiology of sight Sense of smell and taste Overview of important endocrine glands and their functions		6
9	Muscular system	Muscles characteristics Properties of skeletal muscles Properties of smooth muscles		4
10	Reproductive system	Female reproductive system Anatomy- External and internal parts Puberty, menstrual cycle, Fertilization Male reproductive system Elementary anatomy Functions of male reproductive system		8
Total			100	60

Student Seminar – 5 Lectures
Expert Talk – 5 Lectures
Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

No	Title	Author	Publisher
1	Anatomy and physiology in health and illness	Wilson Katheen, Anne Waugh	Churchill livingstone
2	Concise medical physiology	Sujit Chaudhari	Central
3	Textbook of medical physiology	Arthur Guyton and Hall	W.B. Saunders
4	Understanding medical physiology	R. L. Bijlani	Jaypee

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MLMDT 1.2 : General Pathology				
Sr. No.	Topic	Detail	Mark	Lectures
1.	Cell Injury and Cellular Adaptations	Normal Cell Cell Injury- types of cell injury, etiology of cell injury, morphology of cell injury, Cellular swelling Cell death: types- autolysis, necrosis, apoptosis & gangrene Cellular adaptations-atrophy, hypertrophy, hyperplasia & dysplasia Cellular aging, organ changes in aging		10
2.	Haemodynamic disorders	Internal environment Normal water and electrolyte balance Disturbances of body fluids and electrolytes Oedema, overhydration, dehydration Disturbances in volume of circulating blood- Hyperemia and congestion Hemorrhage and shock Circulatory disturbances of obstructive nature- Thromobosis, Ischaemia, Infarction		10
3.	Inflammation and healing	Acute inflammation Vascular events, cellular events Inflammatory cells Morphology of acute inflammation Chronic inflammation General features Granulomatous inflammation Tuberculoma Healing Regeneration, repairs, wound healing Healing in specialized tissues		10
4.	Neoplasia	Nomenclature and classification Characteristics of tumors Local invasion and metastasis and its mechanism Prognostic markers Grading and staging of cancer Epidemiology and predisposition to neoplasia Carcinogenesis Etiology and pathogenesis of cancer Molecular pathogenesis of cancer Chemical, physical, biologic carcinogens Viruses and tumor Clinical aspects of neoplasia Tumor host interrelationship Diagnosis of cancer		12
5	Genetic and pediatric diseases	introduction to Genetic diseases Developmental defects Cytogenetic abnormalities Single gene defects		10

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		Storage diseases Disorders with multifactorial inheritance Other pediatric diseases		
6	Environmental and nutritional diseases	Environmental pollution Air pollution, tobacco smoking Chemical and drug injury Alcohol, lead and carbon monoxide poisoning, drug abuse Environmental chemicals Injury by physical agents Thermal and electrical injury Injury by radiation Nutritional diseases Obesity, Starvation Protein energy mal nutrition Disorders of vitamins Trace elements Diet and cancer		8
Total			100	60

Student Seminar – 5 Lectures
 Expert Talk – 5 Lectures
 Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

No	Title	Author	Publisher
1	Textbook of Pathology	Harsh Mohan	Jaypee
2	Basic Pathology	V.Kumar, S.Robbins	Harcourt
3	Pathology	Emanuel Rubin	Lippincot
4	Pathology	Ian Cree	Chapanmann Hall

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MLMDT 1.3 : Basics of Biochemistry, Instruments and Reagents				
Unit	Topic	Detail	Marks	Min Lec.
1	Chemistry of carbohydrates & their related metabolism	Introduction-Definition Classification Biomedical importance & properties Metabolism: Glycogenesis & glycogenolysis, Glycolysis Citric acid cycle & its significance HMP shunt & Gluconeogenesis Regulation of blood glucose level Hyperglycemia & hypoglycemia Diabetes mellitus - definition, types, features Gestation diabetes mellitus Glucose Tolerance test, glycosuria Hypoglycemia & its causes		12
2	Chemistry of Proteins & their related metabolism	Introduction-Definition Classification Biomedical importance Metabolism: Catabolism of amino acids Removal of NH ₂ group Transformation, Deamination Decarboxylation- Ammonia formation & transport Urea cycle, Metabolic disorders in urea cycle Fate of some important amino acids- Phenylalanine, Tyrosine & Tryptophan Creatine, Creatinine		8
3	Chemistry of Lipids & their related metabolism	Introduction-Definition Classification Biomedical importance, essential fatty acids Metabolism: Beta oxidation of fatty acids Fatty liver Ketosis Cholesterol & its clinical significance Lipoproteins in the blood & their functions Atherosclerosis		8
4	Chemistry of Nucleic acid and metabolism	Introduction-Definition Elementary chemistry of DNA and RNA Structure of nucleotide DNA and RNA molecule and its structure Functions of nucleic acids Nucleotide metabolism- purines and pyrimidines		9

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5	Enzymes	Introduction- definition Classification Coenzymes, isoenzymes, properties Mechanism of action of enzymes Factors affecting enzyme action Enzyme inhibition and regulation Diagnostic value of serum enzymes - Creatinine kinase, alkaline phosphatase, Acid phosphatase, LDH, SGOT, SGPT, Amylase, Lipase, Carbonic anhydrase etc	9
6	Laboratory instruments	Principle and working of basic laboratory instruments Autoclave, Hot air oven, Incubator, pH meter, water bath, centrifuge, Refrigerator, colorimeter, Balance, Flame photometer, Microscope	10
7	Reagent preparation	Concept of molarity and normality Molar, Normal and percent solution preparation, Dilution of the concentrated solution to desired concentration	4
Total			60

Student Seminar – 5 Lectures
Expert Talk – 5 Lectures
Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

No	Title	Author	Publisher
1	Text book of biochemistry for medical students	D M Vasudevan	Jaypee
2	Fundamentals of biochemistry	J L Jain	S Chand
3	Biochemistry	D Voet, J Voet	Wiley
4	TB of biochemistry and human biology	G P Talwar	Prentice Hall

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MLMDT 1.4 : Practical	
Paper	Marks
MLMDT 1.1	100
MLMDT 1.2	100
MLMDT 1.3	100
GMLMDT 1.5	50
Total	350

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GMLMDT 1.5 : Functional English and Communication Skills				
Sr. No.	Topic	Detail	Marks	Min. Lect.
1	Grammar	1. Determiners 2. Tenses <ul style="list-style-type: none"> <input type="checkbox"/> Defining a Verb <input type="checkbox"/> Chief forms of a Verb <input type="checkbox"/> Tense and Time <input type="checkbox"/> Further Division of Tenses <ul style="list-style-type: none"> o The Present Tense o The Past Tense o The Future Tense 3. Active – Passive Voice <ul style="list-style-type: none"> <input type="checkbox"/> Introduction <input type="checkbox"/> Defining the Voice <input type="checkbox"/> Some General rules regarding the change of voice 4. Modals & Auxiliaries <ul style="list-style-type: none"> <input type="checkbox"/> Introduction to Auxiliaries <input type="checkbox"/> The Primary Auxiliaries <input type="checkbox"/> Introduction to Modals <input type="checkbox"/> The Most Commonly used Modals <input type="checkbox"/> Important points about the Modals <input type="checkbox"/> Modals and Their Uses 5. Prepositions / Prepositional Phrases		10
2	Writing Comprehension	1. Business Letters : <ul style="list-style-type: none"> <input type="checkbox"/> Introduction <input type="checkbox"/> Functions of a Business Letter <input type="checkbox"/> Inward Structure / Layout of a Business Letter <input type="checkbox"/> Other Important Parts of Business Letter <input type="checkbox"/> Outward appearance of a business letter <input type="checkbox"/> Arrangement Styles <input type="checkbox"/> Salient Features of a Business Letter <input type="checkbox"/> Legal Aspects of a business Letters <input type="checkbox"/> Kinds of Business Letter Inquiry & Reply Order & Reply Cancellation of order Complaint / Adjustment Sales Letter 2. Report Writing : <ul style="list-style-type: none"> <input type="checkbox"/> Introduction <input type="checkbox"/> The Nature of a Report <input type="checkbox"/> The P's of an Effective Report <input type="checkbox"/> Functions of a Report <input type="checkbox"/> Preparing a Report <input type="checkbox"/> Types of Reports <input type="checkbox"/> Business report 		20

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		<input type="checkbox"/> Press report 3. Job Application / Resume Writing. <input type="checkbox"/> Introduction <input type="checkbox"/> A Cover Letter <input type="checkbox"/> Curriculum Vitae / Resume 4. Letters of Appointment & Resignation.		
3	Conversation Skills	Conversations based on everyday situation / Dialogue Writing. <input type="checkbox"/> Introduction <input type="checkbox"/> Nature of Conversations <input type="checkbox"/> Purpose of conversation <input type="checkbox"/> Guidelines for Effective Conversation Skills <input type="checkbox"/> Proverbs used in Everyday Conversation with their Meanings / Explanations <input type="checkbox"/> Comparisons used in Everyday Conversation <input type="checkbox"/> Practical Conversations		10
4	Communication Skills	(1) Communication – Meaning, Features & Process (2) Verbal & Non – Verbal comm. Verbal Oral Communication Written Communication Non – Verbal Body language Space Para language Others (3) Group discussion skills <input type="checkbox"/> Meaning <input type="checkbox"/> Characteristic <input type="checkbox"/> Do's & Don'ts <input type="checkbox"/> Relevance <input type="checkbox"/> Moderating a group discussion (4) Presentation skills <input type="checkbox"/> Meaning <input type="checkbox"/> Planning a presentation skills <input type="checkbox"/> Preparing a presentation skills <input type="checkbox"/> Delivering a presentation skills <input type="checkbox"/> Presentation skills (5) Public Speaking <input type="checkbox"/> Meaning <input type="checkbox"/> Essential of effective public speaking (6) Facing Interviews <input type="checkbox"/> Importance <input type="checkbox"/> Do's & Don'ts		20
Total			100	60

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Students' seminar - 5 Lectures
Expert Talk - 5 Lectures
Students Test - 5 Lectures

Total Lectures 60 + 15 = 75

Reference Book

No	Title	Author	Publisher
1	High School English Grammar and Composition	Wren & Martin	Churchill Livingstone
2	Anthology of English language and communication skills	Sharma S R, Jacob John	Mark
3	Handbook of practical communication skills		Jaico
4	Language and communication skills	Shastri, Rameshchandra	ABD

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B.Voc.- Medical Laboratory and Molecular Diagnostics Technology (Semester – II)

Sr. No.	Paper No.	Subject	Component	Credit
1	MLMDT 2.1	Clinical Pathology & Parasitology	Skill	5
2	MLMDT 2.2	Hematology	Skill	5
3	MLMDT 2.3	General Microbiology	Skill	5
4	MLMDT 2.4	Practical	Skill	12
5	GMLMDT 2.5	Basic Computer Skills	General Education	3
Total Credits of Semester - II				30

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MLMDT 2.1 : Clinical Pathology and Parasitology				
Sr. no	Topics	Details	Marks	Min Lec.
1	Urine analysis	Formation and Composition of urine Collection and preservation of urine Physical and chemical examination of urine Microscopic examination of urine Clinical significance of urine analysis		6
2	Cerebrospinal fluid analysis	Formation and composition of CSF Collection and preservation of CSF Physical and chemical examination of CSF Microscopic examination of CSF Clinical significance of CSF analysis		4
3	Semen analysis	Composition of semen Collection and preservation of semen Physical and chemical examination of semen Microscopic examination of semen Clinical significance of semen analysis		4
4	Sputum analysis	Composition of sputum Collection and preservation of sputum Physical and chemical examination of sputum Microscopic examination of sputum Clinical significance of sputum analysis		4
5	Introduction to cavity fluids	Transudates and exudates Synovial fluid analysis Peritoneal fluid analysis Pericardial fluid analysis		8
6	Parasitology	Definition - parasitism, Host, Vectors etc. Classification of Parasites		2
7	Protozoa	i. Intestinal Amoebae E. Histolytica and E. coli : Life cycle, Morphology, Disease & Lab Diagnosis ii. Flagellates of intestine/genitalia Giardia lamblia and Trichomonas vaginalis : Life cycle, Morphology, Disease & Lab Diagnosis iii. Malarial Parasite a. Plasmodium vivax : Life cycle, Morphology, disease & lab diagnosis b. Differences between P. vivax, P. malaria, P. falciparum & P.ovale.		12

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8	Nematodes	Intestinal Nematodes: a. Ascaris : Life cycle, Morphology, disease & lab diagnosis b. Brief discussion about Enterobius vermicularis (Thread worm) and Ancylostoma duodenale (Hook worm) Tissue Nematodes: W. Bancrofti - Life cycle, Morphology, Disease & Lab Diagnosis		12
9	Phylum Platyhelminths	Cestodes - T. solium, T. saginata & E. granulosus. Trematodes - S. haematobium & F. hepatica Lab diagnosis of parasitic infections		8
Total			100	60

Student Seminar – 5 Lectures
Expert Talk – 5 Lectures
Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

No	Title	Author	Publisher
1	A Textbook of Parasitology	S.S. Kelkar	Bombay Popular P.
2	Medical Parasitology	Rajesh Karyakarte	Books & Allied ltd
3	Text book of medical laboratory technology	Praful Godkar	Bhalani
4	Clinical diagnosis and management by laboratory methods	Bernard Henry	W B Saunders

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MLMDT 2.2 : Hematology				
Sr. No.	Topics	Details	Marks	Min Lec.
1.	Blood cell formation	Introduction to blood Functions of blood Formation of blood Haemopoiesis Erythropoiesis, leucopoiesis and thrombopoiesis		8
2.	General aspects of anemia	Classification of anemia- Morphological and etiological Iron deficiency anemia- Iron absorption, causes of iron deficiency, lab findings Megaloblastic anemia Causes and lab findings Hemolytic anemia- Classification, causes and lab findings Genetic defects of hemoglobin Sickle cell anemia and thalasaemia		12
3.	General aspects of white cell disorders	Granulocytes and their disorders Monocytes and their disorders lymphocytes and their disorders		10
4.	Haematological malignancies	Acute leukemia Chronic leukemia Malignant lymphoma Multiple myeloma Myeloproliferative disorders		10
5.	Platelets	Blood coagulation Bleeding disorders due to vascular and platelet abnormalities Coagulation disorders		10
6.	Basic Hematological techniques	Preparation of blood collection Basic steps for drawing blood by vein, capillary and artery puncture Complications during and after blood collection Specimen rejection criteria for blood Anticoagulants- types and concentration Transport of blood sample Effect of storage on blood cell morphology Universal precautions		10
Total			100	60

Student Seminar – 5 Lectures

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Expert Talk – 5 Lectures
Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

No	Title	Author	Publisher
1	Essential haematology	A.V.Hoffbrand	Black well
2	De Gruchy's Clinical Haematology in medical practice	Frank Firkin, C Chester man	Black well
3	Principles of haematology	Peter Haen	WCB
4	Haematology	Emmanuel Besa	Harwal

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MLMDT 2.3 : GENERAL MICROBIOLOGY				
Sr. No	Topics	Details	Marks	Min Lec.
1	Morphology and fine structure of bacteria	Size, shape and arrangement of bacteria Bacterial structure Structure external to cell wall Capsule, Flagella, Pili (Fimbriae), Sheath Cell wall structure, Gram nature of bacteria Structures internal to cell wall Cytoplasmic membrane, Inclusion, vacuoles, Nuclear material Spore and cyst		10
2	Growth and Maintenance of bacteria	Bacterial division, Batch Culture, Continuous culture, bacterial growth Total count, viable count, Bacterial nutrition- oxygen requirement, CO ₂ requirement, temperature, pH, light		9
3	Control of microbes	Sterilization and Disinfection Control of microbes by physical and chemical agents Antibiotics		9
4	Culture Media	Basic requirements, Types of media Selective, differential, transport, Maintenance media Anaerobic Cultivation, Preparation of media, Forms of Media		8
5	Pure culture and cultural characteristics	Natural microbial population Selective methods Pure culture- methods of isolating pure culture Maintenance and preservation of pure culture Cultural characteristics		7
6	Staining Methods	Simple, Grams staining, Ziehl-Neelsen staining or AFB staining, Negative staining		5
7	Collection and Transportation of	Methods of specimen collection General Principles, Containers,		8

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	Specimen	Rejection, Samples- Urine, Feces, Sputum, Pus, Body fluids, Swab, Blood Identification of microbes from specimen by 1)Microscopy 2)Rapid methods of identification 3)Molecular methods		
8	Disposal of Laboratory/Hospital Waste	Non-infectious waste, Infected sharp waste disposal Infected non-sharp waste disposal		4
			100	60

Student Seminar – 5 Lectures
Expert Talk – 5 Lectures
Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

No	Title	Author	Publisher
1	Microbiology	Michael Pelczar	Tata McGraw Hill
2	Microbiology	Prescott	Tata McGraw Hill
3	Principles of microbiology	R M Atlas	Tata McGraw Hill
4	Microbiology an introduction	Tortora, Funke	Pearson

MLMDT 2.4 : Practical	
Paper	Marks
MLMDT 2.1	100
MLMDT 2.2	100
MLMDT 2.3	100
GMLMDT 2.5	50
Total	350

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GMLMDT 2.5 : Basic Computer Skills				
Sr. No.	Topics	Details	Marks	Min Lec.
1	Basics & Booting Procedure	Introduction to Computers, Characteristics, Data Processing Cycle History and Generations of Computers Classification of Computer by Processing Capabilities Micro, Mini, Mainframe and Super Computers Layered Approach of Operating System, booting process What is software? Types of Software		10
2	Hardware & Peripherals	What is hardware? Types of Input Devices, Output Device, Peripherals Types of Memory, Internal, External		8
3	Word Processing Using Ms Word	Introduction to Word, Font, Paragraph, Style, Editing, Pages, tables. Illustrations, bookmark, hyperlink, header footer, text, symbol , Page layout ribbon, Foot note End note, Caption, Mail merge, Spell check, comments, Document View, Show Hide, Zoom, Window and Office Button Options, Printing documents. Password Protection		12
4	Spread Sheet Using Ms Excel	Sheet Introduction, Selecting row, column, cell, changing height, and Formula bar. Cell Referencing - Relative, Absolute, Mixed, Calculative Examples like salary sheet, mark sheet etc. Conditional formatting, inserting, deleting row or column, Cell Changing height and width, Pivot table and Pivot chart, types of different chart, editing charts. Print Preview and Page Layout, Useful functions from Function Library. Data sorting and subtotaling, filter, Protecting sheet.		8
5	Presentation Using Ms Power Point	Inserting new slide, different layout of slide, Inserting date, slide number, movie, sound, object, header footer, Designing slide theme and background, custom animation, slide transition		6

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		Rehearse timings, slide show , Setup slide show, hide slide, different views of slide Use of slide master, Printing handout, slide, etc		
6	Internet	Introduction to Internet What is Internet? Use of Internet? Applications of Internet World wide web(web page, web site, web client and web server) Web browsers Search engines Email Blogs and forums Social media and chatting E-commerce FTP Bookmarks Internet Search Basic search Tips and Tricks for search How to stay safe on internet? How to download and upload? IP addressing		8
7	HTML	Introduction HTML Block Structure Basic tags: Texts formatting tags Line breaks Link Color, Image List creation Table, Frame, Form HTML multimedia HTML Plug-in HTML Audio HTML Video Introduction to HTML 5		8
			100	60

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Reference Books:

No	Title	Author
1	Pc Software For Windows Made Simple	R.K. Taxali
2	Introduction To Information Technology	V. Rajaraman
3	Computer Fundamentals	P. K. Sinha.
4	Internet The Complete Reference	Young
5	World wide web design with HTML	Cxavier

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**B. Voc.- Medical Laboratory and Molecular Diagnostics Technology
PROPOSED THEORY & PRACTICAL SUBJECTS- Sem. 3 to 6
(Semester – III)**

Sr. No.	Subject	Component	Credit
MLMDT 3.1	Immunology & Serology	Skill	5
MLMDT 3.2	Endocrinology, Tumor & Cancer markers	Skill	5
MLMDT 3.3	Clinical Biochemistry	Skill	5
MLMDT 3.4	Practical	Skill	12
GMLMDT 3.5	Introduction to Bioinformatics & Biostatistics	General education	3
Total Credits of Semester - III			30

**B. Voc. - Medical Laboratory and Molecular Diagnostics Technology
(Semester – IV)**

Sr. No.	Subject	Component	Credit
MLMDT 4.1	Immunohaematology & Blood Banking Techniques	Skill	5
MLMDT 4.2	Histopathology & Cytology techniques	Skill	5
MLMDT 4.3	Systemic Bacteriology, Mycology & Virology	Skill	5
MLMDT 4.4	Practical	Skill	12
GMLMDT 3.5	Life Education - Yog & Meditation, Positive Thinking, Time Management, Stress Management	General education	3
Total Credits of Semester - IV			30
One month training in Pathological Laboratory			

**Bachelor of Vocational – Medical Laboratory and Molecular Diagnostics
Technology (Semester – I & II)
Saurashtra University
Effective from June - 2014**

**B. Voc.- Medical Laboratory and Molecular Diagnostics Technology
(Semester –V)**

Sr. No.	Subject	Component	Credit
MLMDT 5.1	Molecular biology and rDNA technology	Skill	05
MLMDT 5.2	Clinical genetics	Skill	05
MLMDT 5.3	Molecular diagnostics	Skill	05
MLMDT 5.4	Practical	Skill	12
GMLMDT 5.4	One month hospital internship & report submission	Skill & General Education	03
Total Credits of Semester - V			30

**B. Voc.- Medical Laboratory and Molecular Diagnostics Technology
(Semester –VI)**

Sr. No.	Subject	Component	Credit
MLMDT 6.1	Therapeutic Drug monitoring and toxicology	Skill	05
MLMDT 6.2	Quality Laboratory management and Automation	Skill	05
MLMDT 6.3	Small Research Projects / Dissertation based on Diagnostic techniques/Research Proposal/Review writing	Skill	09
MLMDT 6.4	Practical	Skill	08
GMLMDT 6.4	Medical ethics and ISR	Gen. Education	03
Total Credits of Semester - VI			30