॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड – ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

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Fax : (02462) 215572

Phone: (02462)215542

Academic-1 (BOS) Section

website: srtmun.ac.in

E-mail: bos.srtmun@gmail.com

विज्ञान व तंत्रज्ञान विद्याशाखेतील AEDP अंतर्गत पदवी स्तरावरील प्रथम वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्याबाबत.

प रि प त्र क

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, दिनांक ३१ जुलै २०२५ रोजी संपन्न झालेल्या मा.विद्यापरिषदेच्या बैठकीतील ऐनवेळेचा विषय क्र.०९/६२–२०२५ च्या ठरावानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील **AEDP** अंतर्गत पदवी स्तरावरील प्रथम वर्षाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यास मा.विद्यापरिषदेने मान्यता प्रदान केलेली आहे. त्यानूसार विज्ञान व तंत्रज्ञान विद्याशाखेतील बी.एस्सी प्रथम वर्षाचे खालील विषयाचे अभ्यासक्रम (Syllabus) शैक्षणिक वर्ष २०२५–२६ पासून लागू करण्यात येत आहेत.

01	**B.sc I Year Medical Laboratory Technology (Bsc.MLT)**

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या **www.srtmun.ac.in** या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

सहा.कुलसचिव
शैक्षणिक (१–अभ्यासमंडळे) विभाग

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड – ४३१ ६०६.
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दिनांक :०३.११.२०२५

प्रत : १) मा. कुलगुरू महोदयांचे कार्यालय, प्रस्तुत विद्यापीठ.
२) मा. प्र. कुलगुरू महोदयांचे कार्यालय, प्रस्तुत विद्यापीठ.
३) मा. आधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
४) मा. संचालक, परीक्षा व मुल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
५) मा. प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ यांना देवून कळविण्यात येते की, परिपत्रक अभ्यासक्रम संकेतस्थळावर प्रसिध्द करण्यात यावे.

Swami Ramanand Teerth Marathwada University, Nanded

&

Skill Sector Council of India

Course Structure for

Three Year UG Program

Bachelor Of Science in Medial Laboratory Technology (B.Sc. MLT)

Minor in Computers in Health Care Management

Under

Apprenticeship Embedded Degree Program (AEDP)

Proposed by S.R.T.M. University, Nanded

2025-2026

Program Objectives:

The B.Sc. MLT course aims to:

1. **Build strong laboratory skills** – Teach students to perform a variety of diagnostic tests in biochemistry, microbiology, pathology, hematology, histology, immunology, and other lab areas.
2. **Ensure accuracy in test results** – Train students to work with care and follow correct procedures so results are reliable.
3. **Promote ethics and professionalism** – Encourage honesty, responsibility, and confidentiality in all lab work.
4. **Develop problem-solving skills** – Help students detect errors, troubleshoot issues, and understand test reports.
5. **Teach safety in the lab** – Guide students in safe handling of samples, proper waste disposal, and infection control.
6. **Introduce modern technology** – Familiarize students with advanced laboratory machines and updated testing methods.

Program Outcome:

After completing B.Sc. MLT, students will be able to:

1. **Perform and explain diagnostic tests** – Carry out tests in different laboratory areas and explain their meaning in relation to patient health.
2. **Use and maintain lab equipment** – Operate, clean, and take care of laboratory machines like analyzers, PCR machines, ELISA readers, microscopes, and others.
3. **Apply quality control** – Use proper quality checks to ensure test accuracy and reliability.
4. **Work with ethics** – Keep patient information private and follow all professional rules.
5. **Follow lab safety rules** – Work safely and manage laboratory waste correctly.
6. **Collaborate with healthcare professionals** – Share test results with doctors, nurses, and other healthcare staff to help in patient care.

Credit framework of the 3 Year AEDP Program

Bachelor of Science in Medical Laboratory Technology (B.Sc. MLT)

Sr No.	Heads	Credits assigned in each Semester						Total Credits
		I	II	III	IV	V	VI	
1	**Major**	**6**	**6**	**8**	**10**	**10**	Apprenticeship	**40**
2	**Minor**	**2**	**4**	**4**	**4**	**2**		**16**
3	**Open Elective (OE)**	**2**	**2**	**2**	**--**	**--**		**06**
4	**Vocational and Skill Courses (VSC)**	**4**	**4**	**2**	**2**	**--**		**12**
5	**Ability Enhancement Courses (AEC)**	**2**	**2**	**2**	**--**	**--**		**06**
6	**Value Education Course (VEC)**	**4**	**2**	**--**	**--**	**--**		**06**
7	**Co-curricular (CC)**	**2**	**2**	**2**	**--**	**--**		**06**
8	**Project**	**--**	**--**	**2**	**2**	**2**		**06**
9	**Elective**	**--**	**--**	**--**	**4**	**8**		**12**
10	**Apprenticeship**	**--**	**--**	**--**	**--**	**--**	**22**	**22**
Total Credits		**22**	**22**	**22**	**22**	**22**	**22**	**132**

Total credit Major = 40 (T) + 12 (E) + 12 (VSC) + 06 (P) + 22 (Appr) = 92

Semester -I

Sr. no.	Course Category	Course Code	Name of the Course	Total Credits
1.	SSC (Major) (School Specific Courses)	SSCT - 101	Human Anatomy and Physiology-1	6
		SSCT - 102	Basic Microbiology	
		SSCP - 101	Lab Course Based on Human Anatomy and Physiology-1 and Basic Microbiology	
2.	SSM (Minor)	SSMT - 101	Computers in Health Care Management	2
3.	OE (Open Elective)	SSOE - 101	Fundamentals of Human Diseases and Diagnosis	2
4.	VSC/SEC (VSEC) Courses	VSCT - 101	Microbial Preservation techniques	4
		VSCP - 102	Lab Course Based on Microbial Preservation techniques	
5.	AEC (Any One)	AECE- 101	Communicative English-1	2
6.	VEC (Any One)	VECT-101	Environmental Awareness	2
7.	Indian Knowledge System (IKS)	IKST-101	Generic IKS	2
8.	Co-curricular (CCC) (Any One)	CXXX - 101	NSS/NCC/Sports (SPT) /Yoga (YOG)/Fitness (FIT) /Culture (CUL) /Music (MUS) /Performing Arts (PAT)	2
Total				**22**

Semester II

Sr. no.	Course Category	Course Code	Name of the Course	Total Credits
1.	SSC (Major) (School Specific Courses)	SSCT - 201	Human Anatomy and Physiology-II	6
		SSCT - 202	Hematology and Blood Banking-I	
		SSCP - 201	Lab course Based on Human Anatomy and Physiology-II and Hematology and Blood Banking-I	
2.	SSM (Minor)	SSMT - 201	Fundamentals of Computers	4
		SSMP - 201	Lab Course Based on Fundamentals Computers	
3.	OE (Open Elective)	SSOE – 201	Introduction to Health and Hygiene	2
4.	VSC/SEC (VSEC) Courses	VSCT - 201	X-Ray Technology	4
		VSCP - 202	Lab Course Based on X-Ray Technology	
5.	AEC (Any One)	AECE- 201	Communicative English-2	2
6.	VEC (Any One)	VECC-201	The Constitution of India	2
7.	Co-curricular (CC) (Any One)	CXXX - 101	NSS/NCC/Sports (SPT) /Yoga (YOG)/Fitness (FIT) /Culture (CUL) /Music (MUS) /Performing Arts (PAT)	2
Total				**22**

Bachelor of Science in Medial Laboratory Technology (B.Sc. MLT)

Course wise syllabus

Semester I

SSCT - 101: Human Anatomy and Physiology-1

Unit 1

Introduction to anatomy Different system of Human body Cell- Structure & function. Body Tissue – their functions Common anatomical terms (Anterior/Ventral, lateral, medial, median, posterior/dorsal etc.) Anatomical Position & Planes (Supine, prone, recumbent, lithotomy) planes- coronal, sagittal

Unit 2

Respiratory System Respiratory tract structure, Lung's structure Mechanism of respiration, Vital Capacity. Respiratory Diseases – Tuberculosis, Cystic fibrosis, Pneumonia, Asthma, Respiratory failure, Carcinoma.

Unit 3

Digestive Systems (G. I. T) Teeth, Tongue, Salivary Glands, Tonsils, Stomach, Intestine: small, large Rectum, Anal Canal, Liver, Pancreas, Gall Bladder Digestion & Absorption of proteins, fats & Carbohydrate Diseases- Dental Caries, periodontal diseases, Gastric ulcer, Carcinoma, Celiac disease, Inflammatory Bowel disease, Liver-Cirrhosis & Encephalopathy Cholelithiasis, Pancreatitis.

Unit 4

Cardiovascular System Structure of Heart & its coverings, major Blood vessels- arteries & veins Structure of Blood vessels Cardiac cycle, cardiac output, Blood pressure, factors affecting it. Cardiovascular disease- hypertension, Congestive Cardiac Failure, Transplant, Ischemic heart disease

Course Objectives:

1. Identify and describe the structure and organization of the human body, including major organs, tissues, and anatomical landmarks, through the study of systemic and regional anatomy.

2. Explore the relationships between anatomical structures and their functions, elucidating how form influences function in physiological processes and movement.

3. Develop proficiency in anatomical terminology, anatomical imaging techniques, and anatomical dissection methods, enabling effective communication and hands-on exploration of human anatomy.

Course Outcomes:

1. Comprehensive Understanding of Human Anatomy: Students will demonstrate a thorough comprehension of the structure and function of various systems of the human body, including the respiratory, digestive, and cardiovascular systems, as well as the cellular and tissue-level organization.

2. Application of Anatomical Knowledge: Students will be able to apply anatomical terminology and principles to describe anatomical structures, positions, and planes accurately. They will also analyze the relationship between anatomical structure and function in different systems of the body.

Reference Books:

1. Ross & Wilson, Anatomy and physiology in health illness, LBS, Churchill Livingstone, Medical division of Longman Group (FE) Ltd.
2. C.C. Chatterjee, Human physiology, Medical Allied Agency Calcutta
3. B.D. Chourasia, Human Anatomy, CBS, New Delhi

SSCT – 102 Basic Microbiology

Unit 1

Introduction to microbiology Introduction to Microorganisms, Discovery of Microorganisms, Contribution of Antonie van Leeuwenhoek, Roberts Koch, Louise Pasteur, Paul Ehrlich, Alexander flaming, Joseph Lister, Karl Landsteiner, etc General Characteristics of microorganisms, Classification of Microorganisms, Structure & Function of Bacterial Cell & its arrangement

Unit 2

Sterilization & Disinfection procedures in Microbiology laboratory Sterilization: Definition, Mode of action of Physical methods of Sterilization: Flamming, Incineration, Heat, Hot Air Oven, Autoclave UV- Radiation, Filtration. Disinfections: Mode of action & uses of Chemical disinfectants –Phenol, Alcohol, Halogen, Heavy metals, Qutanary ammonium salts, Aldehyde, gaseous

Unit 3

Culture Media & Isolation methods Culture Media: Types of culture media, Composition, Preparation & uses of Solid Media: Nutrient agar, MacConkeys Agar, XLD, DCA, Blood Agar, TCBS Blood Tellurite Agar, Chocolate agar, Lownstein Jansen media, Loeffer serum slope. Composition, Preparation & uses of Liquid Media: Peptone Water, Nutrient Broth, Bile Broth, Glucose Broth, Transport Media. Inoculation on Different types of culture media in Petriplates, slopes, Broth. Subculture & Preservation of Pure culture. Anaerobic Culture methods with recent advances

Unit 4

Staining & Biochemical Test Quantitation of microorganisms Staining: Principle & reagent of staining of Gram staining, Acid-Fast Staining, Endospore staining, Capsule staining, Flagella staining. Identification of bacteria: IMVIC tests, Hydrogen Sulphide

Production test, Niacin test, Lacithinase test, Nitrate reductase test, Gelatine Liquefaction test, Amino acids metabolism test Quantitaion of Microorganisms: colorimeter, Spectrophotometer, Total count, viable count, Bacteriophage typing methods.

Course Objectives:

1. Understand the basic principles and concepts of microbiology.
2. Describe the structure, function, and classification of microorganisms.
3. Identify the roles of microorganisms in various environments, including their impact on human health.
4. Perform basic microbiological laboratory techniques safely and accurately.

Course Outcomes:

This course provides an introduction to microbiology, focusing on the fundamental concepts of microbial structure, function, genetics, and physiology. Students will explore the roles of microorganisms in health, disease, and the environment. The course includes both theoretical and practical components, emphasizing laboratory techniques and applications.

Reference Books

1. P.Chakraborthy A Text Book Of Microbiology, Calcutta New Central Book Agency.
2. R.Anantnaryan Text Book of Microbiology, Hyderabad Orient Longman
3. Praful B.Godkar Darshan B.Godkar Text Book Of medical lab. Technology Bhalani Publication House

SSCP - 101 Human Anatomy and Physiology-1 and Basic Microbiology Practical

1. Perform Gross Examination of Liver (museums specimen)
2. Perform Gross Examination heart (museums specimen)
3. Perform Gross Examination Lungs (museums specimen)
4. Perform Gross Examination stomach (museums specimen)
5. Perform Gross Examination Intestine (museums specimen)
6. Demonstration of Working Principle of Autoclave.
7. Demonstration of Working Principle of Hot Air Oven.
8. Demonstration of bacterial shape & arrangement by Monochrome Staining Technique.
9. To Demonstration of Bacterial capsule by negative staining.
10. To Prepare Media, Reagent & Perform procedure of liquid & solid media.
11. To Perform Inoculation of Specimen into solid, liquid media & Slant.
12. To Perform Plating Methods for isolation of Bacteria.

SSMT – 101 Computers in Health Care Management

Unit 1: Basics of Computers in Healthcare

- What is a computer?
- Parts of a computer: Monitor, CPU, Keyboard, Mouse
- How computers are used in hospitals
- Health records: Paper vs. digital
- Introduction to health-related computer systems

Unit 2: Hospital Computer Systems

- How hospitals use computers in different departments (OPD, IPD, Lab, Pharmacy, Billing, Radiology)
- Patient registration and appointment booking
- Basics of data storage and retrieval
- Hospital Management System (HMS)

Unit 3: Computers in Medical Tests

- Use of computers in CT scan, MRI, X-ray, Ultrasound
- Computers in pathology labs
- Patient monitoring using machines (ICU, BP, ECG, etc.)
- Introduction to telemedicine (doctor from far can see reports)

Unit 4: Safety and New Technology

- Keeping patient data safe (privacy and security)
- Good and safe use of computers in hospitals
- New technology: Mobile apps, smart watches, AI in healthcare
- Simple rules for using hospital computers ethically

Course Objectives:

By the end of this course, the student will be able to:

- Understand the basic use of computers in hospitals and clinics.
- Learn to handle patient data using computer systems.
- Gain basic skills in hospital software for different departments.
- Learn safe and ethical use of health information technology.

- Become familiar with modern computer-based healthcare tools.

Career Outcomes:

After completing this course, students can work as:

- Hospital/Clinic Reception and Data Entry Assistant
- Medical Office Assistant
- Health Record/Data Operator
- Lab/Radiology Software Assistant
- Telemedicine Assistant

Reference Books:

- Basic Computers for Healthcare Workers – Simple Edition
- Introduction to Computers in Healthcare – Dr. S. Sharma
- Health Information for Beginners – Easy Learning Series
- Computers Made Easy for Medical Staff – P. Joshi

SSOE 101 – Fundamentals of Human Diseases and Diagnosis

Unit 1: Introduction to Human Body and Disease

- Basic body systems: Digestive, Respiratory, Circulatory, Nervous, Urinary
- What is a disease? Types of diseases: Infectious, Genetic, Lifestyle
- Causes of disease: Bacteria, viruses, poor lifestyle, pollution, etc.
- Signs and symptoms of illness
- Prevention and health promotion

Unit 2: Common Infectious and Lifestyle Diseases

- Communicable diseases: Tuberculosis, Malaria, Typhoid, Hepatitis, COVID-19
- Non-communicable diseases: Diabetes, Hypertension, Heart disease, Obesity
- Cancer: Basic idea and warning signs
- First aid and emergency signs
- Vaccination and its importance

Unit 3: Basics of Disease Diagnosis

- Importance of early diagnosis
- Patient history and physical examination

- Use of laboratory tests (blood, urine, stool tests)
- Use of imaging tests (X-ray, CT scan, MRI, ultrasound)
- Referral to specialists and hospital admission

Unit 4: Diagnostic Tools and Supportive Tests

- Blood pressure, pulse, temperature, oxygen monitoring
- ECG: Basic idea
- Blood sugar testing (glucometer)
- Pregnancy tests, rapid tests (malaria, dengue, HIV)
- Infection control and patient safety in diagnosis

Course Objectives:

By the end of this course, the student will be able to:

- Understand the basic structure and function of the human body.
- Identify common human diseases and their causes.
- Learn basic signs, symptoms, and diagnosis methods.
- Assist healthcare professionals in identifying and managing diseases.

Career Outcomes:

After completing this course, students can work as:

- Medical Assistant or OPD Attendant
- Diagnostic Center Helper
- Patient Support Staff
- Basic Health Worker in clinics or health camps
- First Aid and Health Education Assistant

Reference Books:

- Basic Pathology and Human Diseases – Dr. S. N. Sharma
- Introduction to Human Diseases – Zelman, Raymond
- Essentials of Human Diseases and Conditions – Margaret Schell Frazier
- Manual of Common Diseases for Health Workers – Dr. R. Joshi

VSCT – 101 Microbial Preservation techniques

Unit 1

Introduction to Microbial Preservation Principles of Microbial Preservation, Factors affecting microbial viability, Traditional Preservation Techniques, Heat-based methods (Pasteurization, Sterilization) Cold-based methods (Refrigeration, Freezing) Drying techniques (Desiccation, Lyophilization)

Unit 2

Modern Preservation Techniques Chemical Preservation, Antimicrobial agents (Preservatives, Antibiotics), Chemical disinfectants, Low-temperature preservation (Cryopreservation), Freeze-drying (Lyophilization), Encapsulation techniques.

Unit 3

Innovative Preservation Approaches, Storage and Maintenance of Preserved Microorganisms High-pressure processing, Pulsed electric field technology, Radiation-based preservation, Storage conditions, Quality control measures.

Unit 4

Applications of Microbial Preservation Biotechnology and pharmaceutical industries, Food and beverage preservation, Conservation of microbial diversity.

Course Objectives:

1. Explore the principles underlying microbial preservation techniques.
2. Discuss emerging trends and advancements in microbial preservation.

Course Description:

Microbial Preservation Techniques is a comprehensive course designed to explore various methods employed to preserve microorganisms for research, industrial, and medical purposes.

Textbook:

1. "Principles of Microbial Preservation" by John Smith

2. "Microbial Preservation Techniques: Methods and Applications" by Jane Doe

VSCP – 102 Microbial Preservation techniques Practical

Short-term Preservation Methods

1. Maintenance of microbial culture on agar slants and stabs
2. Refrigeration of microbial cultures Long-term Preservation Methods
3. Cryopreservation of microbial cultures
4. Lyophilization (Freeze-drying) of microbial cultures
5. Viability Testing and Reviving Cultures
6. Colony forming unit (CFU) count post-preservation

7. Staining and morphological observation of preserved vs. fresh cultures

Semester II

SSCT – 201 Human Anatomy and Physiology-2

Unit 1

Introduction to anatomy Definition of anatomy & its division Common anatomical terms (anterior/ventral/lateral/medial /median/posterior/dorsal) Anatomical position and planes Planes-coronal, sagittal Bones Structure of bones Classification of bones with example Formation Function of bones.

Unit 2

Central Nervous System Brain – Coverings Parts of brain, function, Spinal cord, peripheral nerves, Autonomic nervous system- sympathetic parasympathetic. Diseases- Stroke, Alzheimer's disease, epilepsy, Myasthenia Gravis Parkinson's disease Genito-Urinary System and Skin Structure and functions of the Skin

Unit 3

Kidney –Ureter, Bladder Kidney – Structure & Function of Nephrons Mechanism of urine formation Formation of erythropoietin and some common kidney diseases.

Unit 4

Diseases Maintenance of acid base balance and electrolyte Balance Normal body temperature and mechanism of its Diseases- Urolithiasis, Renal failure & transplant, Hypo & hyperpyrexia Testis- Vas deferens, prostate, Seminal vesicles, Ovaries, uterus, vagina Diseases- Menopause, Carcinoma.

Course Objectives:

1. Understand the basic concepts and principles of human physiology.
2. Explain the physiological mechanisms that maintain homeostasis.

Course Outcomes:

This course provides an in-depth study of the physiological functions of the human body. It covers the major systems, including the nervous, cardiovascular, respiratory, renal, digestive, endocrine, and muscular systems. The course emphasizes the mechanisms of homeostasis and the integration of physiological functions in health and disease.

SSCT – 202 Hematology and Blood Banking-I

UNIT-1

Physiology of blood: (i) Normal Erythropoiesis, (ii) Leucopoesis, (iii) Formation and function of blood platelets.

Introduction: (i) Collection of blood samples for haematological studies, (ii) Types of anticoagulants. (iii) Capillary blood, venous blood and storage of samples.

UNIT-2

Blood group system – (i) ABO blood group system, subgroup of ABO, variants of ABO blood group system, (ii) Rh blood group system, (iii) Serological techniques for detection of ABO and Rh antigens, (iv) Technique for blood grouping and serological Techniques.

Blood collection: i) Screening of donor, (ii) Blood Collection, (iii) Storage and transportation of blood, (iv) Component preparation: a) Red cell concentrate, b)Washed red cells, c) FFP d) Cryoprecipitate, e) Platelet concentrate.

UNIT-3

Haematology: Methods of blood collection and anticoagulants, Haemoglobin estimation, Total R.B.C, Total W.B.C. count, Platelet count, Packed cell volume/ determination of haematocrit, bleeding time, whole blood coagulation time and prothrombin time. Osmotic fragility test.

UNIT-4

Blood banking: ABO cell grouping and serum grouping by slide and tube method. Rh typing – various techniques. Anti A/ anti B titer, Anti D titration by albumin and indirect antiglobulin technique, Test for HBsAg (Hepatitis B surface Antigen) ELISA and Rapid Test (Demonstration). Test for HIV Antibodies (ELISA and Rapid Test).

Course Objectives: Students must understand how to assess laboratory and pathological testing, including specimen collection, handling techniques, and the competency of the professional doing the tests. A greater grasp of laboratory tests will not only let testing to be employed more efficiently but will also provide a deeper and more accurate comprehension of the nuances and interpretation of lab assessment.

Learning Outcome:

1 Students will comprehend the pathological foundation of sickness for which a certain test is done.

2 Students will comprehend the limitations of such studies in order to be able to pick the most appropriate diagnostic test for a specific diagnostic issue.

Reference book:

1. Medical Laboratory Technology,5th reprint 1999,Vol.I,II & III, K.L.Mukharjee,

TataMcGraw Hill

2. Text book of Medical Laboratory Technology, P.B.Godkar, 1994,Bhalani Publishing

House, Mumbai.

3. Medical Laboratory Technology, Ramnik Sood, 4th ed., 1994,Jaypee Brothers.

4. Hand book of Medical Laboratory Technology, Bharucha, Meyerm, Mody, Carman.

5. Lynch's Medical Laboratory Technology, 3rd ed., Stanley S. Raphael, W. B. Saunders Company, Asian edition. 20.

6. Practical Haematology. J. A. Dacie & S. M. Lewis, The English Language Book Society, 8th ed., ElBS.

SSCP – 201 Haematology, Blood Banking-1 and Human Anatomy and Physiology-2 Practical

1. Perform Gross Examination of Liver (museums specimen)
2. Perform Gross Examination heart (museums specimen)
3. Perform Gross Examination Lungs (museums specimen)
4. Perform Gross Examination stomach (museums specimen)
5. Perform Gross Examination Intestine (museums specimen)
6. Lab safety assessment
7. Physical examination of urine
8. Determination of protein and glucose in urine
9. Examination of throat and mouth specimen
10. Storage of specimen
11. Methods of blood collection and anticoagulants
12. Separation of serum and plasma from whole blood

SSMT – 201 Fundamentals of Computer

Unit 1: Computer Basics and Classification

- Definition and characteristics of computers
- Types of computers: Analog, Digital, Hybrid, Supercomputers
- Generations of computers (1st to 5th)
- Difference between hardware and software
- Role of computers in different sectors (education, business, science)

Unit 2: Input-Output and Storage Devices

- Input devices: Scanner, Joystick, Light Pen, MIC, Web Camera
- Output devices: Projector, Plotter, Speakers
- Primary and secondary storage: RAM, ROM, Hard Disk, SSD, Cloud Storage
- Storage units: Bit, Byte, KB, MB, GB, TB
- Data backup and storage safety

Unit 3: System Software and Application Software

- Types of software: System, Application, Utility
- Operating Systems: Basic roles and types (GUI vs CLI)
- Common utility programs (antivirus, file management tools)
- File types and extensions: .docx, .jpg, .pdf, .exe, etc.
- Installing and uninstalling software (theory)

Unit 4: Introduction to Programming and IT Concepts

- Basics of programming: Algorithm, Flowchart
- Introduction to coding (using simple block-based tools like Scratch)
- Number systems: Binary, Decimal, Conversion
- Computer ethics, plagiarism, and copyright
- Introduction to mobile computing and apps (non-healthcare related)

Course Objectives:

By the end of this course, the student will:

- Understand how a computer works at the basic hardware and software level.
- Learn about computer types, input-output devices, and number systems.
- Understand file formats, software types, and basic system settings.
- Get introduced to programming logic and basic coding concepts.
- Build a strong foundation for further study or professional use of computers.

Career Outcomes:

After completing this course, students can:

- Work as basic computer lab assistant
- Support system technicians in software/hardware setup

- Assist in educational and office environments requiring technical help
- Build interest in programming and data science for future specialization
- Be prepared for higher-level IT or diploma courses

Reference Books:

- Computer Fundamentals – Anita Goel (Pearson)
- Learn Computer Basics in 7 Days – Krishna Rungta
- Introduction to Computers – Peter Norton
- Fundamentals of Information Technology – Alexis Leon

SSMP – 201 Lab Course Fundamentals of Computers

1. Identify and explain different types of input and output devices
2. Compare different storage devices and demonstrate file storage
3. Identify file types by extension and open with suitable software
4. Create simple folder and file structure for organizing data
5. Run utility tools (e.g., disk cleanup, antivirus scan)
6. Draw flowchart for real-life activity (e.g., making tea)
7. Do binary to decimal and decimal to binary conversion manually
8. Use a simple block coding tool (like Scratch or code.org) to run a basic program

SSOE – 201 Introduction to Health and Hygiene

Unit 1: Introduction to Health and Personal Hygiene

- What is good health?
- Importance of bathing, clean clothes, oral hygiene
- Hand washing steps and hygiene tools (soap, sanitizer, tissue)
- Menstrual hygiene and waste disposal

Unit 2: Cleanliness at Home and Workplace

- House cleaning: Kitchen, toilets, water tanks
- Use of disinfectants and cleaning tools
- Safe disposal of waste
- Clean environment in hospitals and labs (basic idea)

Unit 3: Infection and Disease Prevention

- What is infection? How does it spread?

- Common germs (bacteria, virus, fungi – simple idea)
- Use of gloves, mask, and sanitizer
- Vaccination and its role in prevention

Unit 4: Healthy Habits and First Aid

- Safe eating, clean drinking water
- Exercise, sleep, and stress management
- First aid for small injuries, burns, fainting
- When to see a doctor

Course Objectives:

By the end of this course, the student will be able to:

- Understand the meaning of good health and personal hygiene
- Learn about cleanliness, hand washing, and safe food habits
- Know how infections spread and how to prevent them
- Identify simple steps for home health and cleanliness

Career Outcomes:

This subject helps students to:

- Work as health assistants in schools, NGOs, or clinics
- Support infection control in hospitals/labs
- Join as helpers in community health projects
- Build base for studying MLT, Nursing, Public Health

Reference Books:

- Personal Hygiene and Health – NCERT (School Level)
- Health and Hygiene for All – Dr. Kiran Sharma
- Infection Prevention Made Simple – Local Govt. Manual
- Basic First Aid Handbook – Red Cross Society

VSCT - 201 X-Ray Technology

Unit 1

History of X-rays, X-ray Tube Construction: Cathode, Anode, Tube housing, X-ray Production: Bremsstrahlung and Characteristic radiation. Radiation exposure charting.

Unit 2

Components of X-ray machine, Film/screen systems and digital radiography, Cassettes and image receptors, Patient positioning (Chest, Skull, Abdomen, Spine, Limbs)

Unit 3

Types of X-ray Machines: Fixed, Mobile, Digital, Control Panel: kVp, mA, Exposure Time, Focal Spot Size, Factors Affecting Image Quality: Density, Contrast, Sharpness, Distortion, Grids and Beam Restriction Devices

Unit 4

Contrast studies: Barium, IVP, HSG, Darkroom procedures and image processing, Quality control and maintenance, Safety Measures in X-ray Room, Maintenance and Quality Control of X-ray Equipment.

Reference book:

- "Manual of Radiographic Technique" – A. M. Stewart
- "Clark's Positioning in Radiography" – Whitley, Jefferson, Holmes
- "Essentials of Radiologic Science" – Robert A. Fosbinder

VSCP – 202 X-Ray Technology Practical

1. Operation of X-ray machine (analogue/digital)
2. Chest X-ray in PA and lateral views
3. Upper and lower limb X-ray positioning
4. Abdomen and spine positioning
5. Barium swallow/meal enema demo (contrast technique)
6. Use of CR/DR systems
7. Darkroom film development (manual and auto processor)
8. X-ray equipment maintenance check