



EKLAVYA

UNIVERSITY

ज्ञानप्राप्तये लक्ष्यसन्धानम्

Sagar Road, Damoh (M.P.), Bharat

01

Eklavya University, Damoh (MP)

B.M.L.T. Ist Year

Syllabus 2022-23

School of Nursing & Paramedical Science

**BACHELOR IN MEDICAL LAB TECHNOLOGY (BMLT)
SCHEME OF EXAMINATION: BMLT-1st Year**

S.No.	Subject code	Subject	University Examination Theory	Internal Assessment	External Practical	Total
1	BMLTE20Y101	Basic Histology (Anatomy & Physiology)	100	100	100	300
2	BMLTE20Y102	Microbiology-I	100	100	100	300
3	BMLTE20Y103	Biochemistry-I	100	100	100	300
4	BMLTE20Y104	Hematology-I	100	100	100	300
Total Max. Marks						1200

Note- Internal Assessment marks will be added in theory marks; candidate have to get min. 50% marks i.e.-100 marks in theory and internal assessment collectively for passing the examination and in practical he/she should get 50% marks i.e.-50 marks to get pass.

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ज्ञानं प्राप्स्ये लक्ष्यं संधानम्

Estd. by Madhya Pradesh Nij Vishwavidyalaya (Sheopur Avam Santhalana) Aghyadesh, 2020

School Of Nursing & Paramedical Science

Department of Paramedical Sciences

Syllabus

For

Bachelor of Medical Laboratory Technician

BMLT

P. J. N.



EKLAVYA
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School Of Nursing & Paramedical Science

ज्ञानं प्राप्तये लक्ष्यं संधानम्

Est'd. by Madhya Pradesh Niji Vishwavidyalaya (Shiksha Avam Sanchalanat Achhyadesh, 2020)

Bachelor of Medical Laboratory Technician

VISION STATEMENT OF EKLAVYA UNIVERSITY

Eklavya University, will transform lives and communities through learning.

MISSION STATEMENT OF EKLAVYA UNIVERSITY

- Nurture achievers in life and careers through a value based, industry relevant and future ready education.
- Emphasize research, interdisciplinary learning, and practical hands on education.
- Equip every student with the required social and technical skills to achieve employment generation.
- Provide a holistic education deeply rooted in the ways of the traditional Gurukul system.
- Bring quality education within the reach of every individual, by committing to the achievement and maintenance of excellence in education, research and innovation.
- Create and disseminate knowledge through research and creative inquiry.
- Serve students by teaching them problem solving, leadership and teamwork skills, lateral thinking, commitment to quality and ethical behavior.
- Create a diverse community, open to the exchange of ideas, where discovery, creativity, and personal and professional development is encouraged and can flourish.
- Contribute to the social fabric and economic health of the Bundelkhand region, the state and the country at large, by enhancing and facilitating economic empowerment, providing equal opportunities and employment generation.



EKLAUVYA
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School Of Nursing & Paramedical Science

ज्ञान प्राप्तये लक्ष्य संधानम्

Estd. by Madhya Pradesh Niji Vishwavidyalaya (Sthapna Ayam Sanchalana) Adhyadesh, 2020

VISION STATEMENT OF DEPARTMENT

1. To establish & develop world class self reliant institute for imparting Medical and other Health Science education at under-graduate, post-graduate & doctoral levels of the global competence.
2. To serve & educate the public, establish guidelines & treatment protocols to be followed by treating hospitals.

MISSION STATEMENT OF DEPARTMENT

1. To practice medicine ethically in line with the global standard protocols.
2. To inculcate high moral, ethical and professional standards among students and to improve their overall personality as well as to inculcate compassionate behavior.

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Bachelor of Medical Laboratory Technician

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The Bachelor course is designed for students who are desirous of taking up careers in Paramedical Sciences. This program is aimed at preparing well-trained, professionals who possess both intellectual and technical rigor of high caliber in the areas of Paramedical. The syllabus is wide ranging and indicates a judicious mix of the theoretical orientation and practical knowledge.





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School Of Nursing & Paramedical Science

Bachelor of Medical Laboratory Technician

PROGRAMME OUTCOMES (POs)

1. To help the students acquire laboratory and research skills through practical work, assignments, project reports, seminars, workshops and to acquaint them with advanced and clinical practices.
2. To equip the students with sound theoretical knowledge, professional skills and competencies required in paramedical studies.
3. To offer thorough understanding of the issues, ideas and challenges of 21st century thereby broadening the world view of the future laboratory practitioners.
4. To develop multi-tasking skills required in Pathology and Hospitals.
5. To train the students with equipments and infrastructure so that they understand the latest developments in the field.



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School Of Nursing & Paramedical Science

Bachelor of Medical Laboratory Technician PROGRAMME SPECIFIC OUTCOMES (PSOs)

The key outcomes planned in this undergraduate programme in Bachelor in Medical Laboratory Technician are underpinned as follows:

After completing this undergraduate programme, student will:

1. Students will be able to define and explain major concepts in the biological sciences.
2. Examine and analyze the nature and seriousness of the patient's condition or extent of injuries to assess the need for emergency medical care, perform appropriate medical care based on assessment findings of the patient's condition, lift, move, position and otherwise handle the patient to minimize discomfort and prevent further injury.
3. Medical Students will be able to define and explain major concepts in the biological sciences.
4. They are able to correctly use biological instrumentation and proper laboratory techniques.
5. Demonstrate the roles and responsibilities of a paramedic within an EMS system, perform the basic concepts of development, pathophysiology and pharmacology to assessment and management of emergency patients, be able to properly administer medications, and apply effective communication with patients, peers, and healthcare professionals.
6. Perform airway management including oxygenation and ventilation of a patient.
7. Demonstrate a proper history and perform a comprehensive physical examination on any patient, and communicate findings to others.
8. Demonstrate integration of pathophysiological principles and analyze assessment findings to formulate a field impression and implement the treatment plan for the medical patient.
9. Demonstrate integration of pathophysiological principles and analyze assessment findings to formulate a field impression and implement the treatment plan for the trauma patient.
10. Perform safety management principles at the scene of an emergency



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ज्ञान प्राप्तये लक्ष्य संस्थानम्

Estd. by Madhya Pradesh Niji Vidyapeethyaya (Sthapna Avam Sanchalana Adhyadesh, 2020)

School Of Nursing & Paramedical Science

DETAILED CURRICULUM



School Of Nursing & Paramedical Science

EKLAVA UNIVERSITY DAMOH
BACHELOR IN MEDICAL LAB TECHNOLOGY (BMLT)
SCHEME OF EXAMINATION: BMLT-1st Year

S.No.	Subject code	Subject	Theory Internal	Internal Assessment	Practical	Total
1	BMLTE20Y101	Basic Histology (Anatomy & Physiology)	100	100	100	300
2	BMLTE20Y102	Microbiology-I	100	100	100	300
3	BMLTE20Y103	Biochemistry-I	100	100	100	300
4	BMLTE20Y104	Hematology-I	100	100	100	300
Total Max. Marks						1200

Note- Internal Assessment marks will be added in theory marks; candidate have to get min. 50% marks i.e.-100 marks in theory and internal assessment collectively for passing the examination and in practical he/she should get 50% marks i.e.-50 marks to get pass.

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ज्ञान प्राप्तये लक्ष्य संस्थानम्

Estd. by Madhya Pradesh Nij Vichheavidyayala (Siksha Prava Samachalana Adhyadesh, 2020)

School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

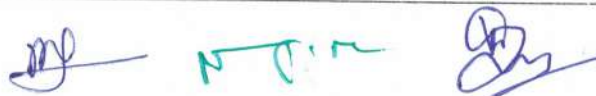
BMLT

3 YEAR DEGREE COURSE

Year	BMLT 1 st Year
Subject	Basic Histology (Anatomy & Physiology)
Time	75 Hours (Theory + Demonstration)

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Course code	Basic Histology (Anatomy & Physiology)	
BMLTE20Y101		
Pre-requisite	Nil	Syllabus version
Course Objectives:		
<ol style="list-style-type: none"> 1. To prompt introspection and motivate students towards self-appraisal, goal-setting and problem solving. 2. Familiarize students with negotiation techniques and importance of right attitude for better coordination and team building. 3. Guide students to better drafting in creative and critical compositions. 4. Help students review policies of global importance affecting corporate interactions. 		
Course Outcome:		
<ol style="list-style-type: none"> 1. To help students identify & describe Anatomical aspects of muscle bones & Joints. 2. To understand the Anatomical and physiological basis of various clinical conditions e.g. trauma, deformities, pertaining to limbs & spine etc. 3. To understand & describe the mechanism working fo different organs. 4. To understand the physiological processes at cellular level, functional components and that help to survive. 5. To enable students identify & describe the source, course and physiology of circulatory system and other functional systems. 6. To Acquired the knowledge of the relative contribution of each organ system in maintenance of the homeostasis 		
Student Learning Outcomes (SLO):		
<ol style="list-style-type: none"> 1. Students will be able to demonstrate their ability to perform an appropriate primary/initial assessment of the ill or injured patient in the pre hospital setting. 2. Students will be able to demonstrate their ability to perform an appropriate secondary/focused history and physical exam of the trauma patient in the pre-hospital setting. 3. Students will be able to perform an appropriate secondary/focused history and physical exam for patients with medical complaints or signs and symptoms in the pre-hospital setting 4. Students will be able to formulate an appropriate treatment plan to include administration of IV fluids and/or pharmacological medications for the trauma patient in the pre hospital setting. 		



Unit – 1	15
The anatomic and physiological organization of human body and integrated physiology, Cell Organization and function, Skeletal system, bones, joints, and muscles, Body fluids and their significance, Blood morphology, chemistry and function.	
Unit – 2	15
Respiratory system, Cardiovascular system, Alimentary system, mechanism and physiology of digestion and absorption. Liver structure, Urinary system, Male genital system. Female genital system, Nervous system. Spleen, lymph node and R.E. System. Endocrine glands and their functions.	
Unit – 3	15
Introduction to histopathology and laboratory organization, Laboratory equipment, uses and maintenance, Laboratory hazards and safety precautions ,Compound microscope – optical system, magnification and maintenance.	
Unit – 4	15
Reception, recording and labeling of histology specimens, Fixation and various fixatives, Processing of histological tissues for paraffin bedding, Embedding and embedding media, Decalcification various types, there Micro tomes various types, there working principle and maintenance, Microtome knives and knife sharpening, Practical section cutting, cutting faults and remedies, Routine staining procedures, mounting and mounting media. Dye chemistry, theory and practice of staining. Solvents, mordents, accelerators and accentuators, Uses of controls in various staining procedures.	
Unit – 5	15
Introduction to exfoliative cytology with special emphasis on female genital tract, Collection processing and staining of the Cytologic specimen.	
# Mode: Flipped Class Room, Case Discussion, Lectures.	
Suggested Reading:	
1. Text Book of Medical Laboratory Technology Histology, 5th edition – Praful B. Godkar.	
2. Text Book of Medical Laboratory Technology 5th edition – RamnikSood.	
3. Text Book of Histology ,A.K Jain and B.D Chourasia	
4. Drew Provan, Andrew Krentz. Oxford Handbook of Clinical and Laboratory Investigation 2nd edition. Oxford University Press.	

Practical

1. Gross examination and fixation of the specimen
2. Decalcification of the calcified tissue
3. Processing of histology tissue for paraffin embedding
4. Study of microtome and sharpening of the microtome knife.
5. Section cutting of paraffin wax embedding tissue.
6. To fix the sections of the slides.
7. Preparation of variable percentage alcohol from commercially available ethyl alcohol.
8. Staining of tissue section using haematoxylin eosin and peppicolous staining method.
9. Study Bone –Upper Limb, Lower Limb, Skull, Vertebrate etc.
10. Physiological Study of system Organ
Kidney ,Heart, Liver, Lungs, Spleer
Male Reproductive
Female Reproductive



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School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

BMLT

3 YEAR DEGREE COURSE

Year	BMLT 1 st Year
Subject	Microbiology-I
Time	75 Hours (Theory + Demonstration)

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Course code	Microbiology – I	
BMLTE20Y102		
Pre-requisite	Nil	Syllabus version
Course Objectives:		
<ol style="list-style-type: none"> 1. Students will be able to explain the general and specific structure of microorganism 2. The course will provide basic understanding of various types of cells and organisms. 3. Students will be able to understand how to grow and control microorganisms. 4. The course will provide the conceptual basis for understanding pathogenic microorganism and particularly address the fundamental mechanisms of their pathogenicity. 5. Student will be able to explain to prevent infectious diseases including infection control measures 		
Course Outcome:		
<ol style="list-style-type: none"> 1. Students will be able understand general and specific structure of microorganism 2. Students will understand various types of cells and organisms. 3. Students will be able to demonstrate basic microbiology laboratory techniques that will allow students to investigate the structure and physiology of microorganisms. 4. To Learn about Microbiology as a major should have a thorough knowledge and understanding of the core concepts in the discipline of Microbiology. 5. To able to know about how microorganisms are used as model systems to study basic biology, genetics, metabolism and ecology. 		
Student Learning Outcomes (SLO):		
<ol style="list-style-type: none"> 1. Students will have a thorough knowledge and understanding of the core concepts in the discipline of Microbiology. 2. Students will know about how microorganisms are used as model systems to study basic biology, 3. Genetics, metabolism and ecology. 4. Students will understand about applications of microorganisms. 5. Students will understand the nature and details that microorganisms are ubiquitous in nature. 		




Unit – 1	15
Introduction and brief history of microbiology. Safety measures in microbiology. General characteristics and classification of bacteria and fungi. Growth and nutrition of microbes. Care and maintenance of laboratory equipments. Care and handling of various microscopes - binocular, dark field, phase contrast, fluorescence and electron microscope. Principles and methods of sterilization.	
Unit – 2	15
Uses and mode of action of antiseptics and disinfectants. Handling and cleaning of glassware apparatus, decontamination and disposal of contaminated material. Preparation, uses and standardization of culture media. Principles of staining methods and preparation of reagent. Aerobic and anaerobic culture methods. General characters and nature of antigens and antibodies. Principles of antigen antibody reactions. Endocrine glands and their functions.	
Unit – 3	15
Collection , transportation and processing of clinical samples for microbiology Investigations. Principles and mode of action of antibiotics and chemotherapeutic agents for bacteria and fungi. Care and handling of laboratory animals. Laboratory organization, management, recording of results and quality control in microbiology.	
Unit – 4	15
Virology-Introduction to medical virology, Nomenclature and classification of viruses. General characteristics of viruses: - physical, chemical and biological properties. Collection, transport, processing and storage of samples for viral diagnosis.	
Unit – 5	15
Parasitology-Introduction to medical parasitology, General characteristics and classification of protozoa, Laboratory procedure collections, preservation and processing of samples for parasites. Morphology and life cycle of intestinal protozoa:- Entamoeba and Giardia, Laboratory diagnosis of intestinal protozoal infection- Entamoeba and Giardia, Morphology and laboratory diagnosis of - trichomonas vaginalis, entamoeba gingivalis. Morphology and life cycle of haemprotozoa:- Plasmodium(malaria parasite). Laboratory diagnosis of malaria parasite infection, characters and classification of helminthes, Morphology and life cycle of Nematodes (intestinal):- Ascaris, Enterobius, Ancylostoma, Strongyloides, Laboratory diagnosis of intestinal Nematode infection.	
Practical	
<ol style="list-style-type: none"> 1. Introduction to use the different instruments and their safety. 2. To study the working principle of various microscope core and its maintenance. 3. To study the principle and method of sterilization. 	

4. To prepare the following culture media.
 - a) Nutrient agar
 - b) MacConkey agar
5. Isolation of microorganisms by streak plate method
6. To stain bacteria in culture by gram staining method.
7. Staining of sputum smear for the detection of Mycobacterium tuberculosis by Ziehl-Neelsen method.
8. To study the motility of bacteria.
9. Identification of bacteria by gram staining.
10. To determine bacterial cell count.

Mode: Flipped Class Room, Case Discussion, Lectures.

1. Harley, Klein and Prescott, textbook of microbiology, Tata McGraw Hill
2. Pelczar, Chan & Kreig, Microbiology, Tata McGraw Hill.
3. Salle AJ, "Fundamentals of Principles of Bacteriology", Tata McGraw Hill
4. Purohit, Microbiology, Agrobios India.
5. Dubey & Maheshwari, "Textbook of Microbiology", S.Chand
6. Laboratory acquired infections by C.H. Collins Manual of Clinical Laboratory methods by Copal E Hopier Medical Laboratory Methods By Beuer Bailey & Scott's diagnostic microbiology by Tille, P. M.

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School Of Nursing & Paramedical Science

Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	BMLT 1 st Year
Subject	Biochemistry - I
Time	75 Hrs

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Course code	Biochemistry – I	
BMLTE20Y103		
Pre-requisite	Nil	Syllabus version
Course Objectives:		
<ol style="list-style-type: none"> 1. To know various biochemical processes occurring inside human body at cellular and molecular level 2. To know about the mechanism, requirement and factors affecting the biochemical processes at all levels. 3. To understand the outcome of different biochemical processes. 4. To understand the affects of various biochemical processes on human body. 5. To understand and practice various methods of analysing various biochemical contents in samples. 		
Course Outcome:		
<ol style="list-style-type: none"> 1. Student will acquire knowledge about pathology, biochemistry and microbiology lab procedures. 2. Student will have proper understanding of procedures carried out in lab 3. Student will be able to work in different labs independently. 4. Student will know about various instruments used in medical laboratory. 		
Student Learning Outcomes (SLO):		
<ol style="list-style-type: none"> 1. To know about mentainance and care of the instruments used in medical laboratory. 2. To know about methods of application, optimization and calibration of the medical laboratory devices in lab 3. Student will understand various biochemical processes occurring inside human body at cellular and Molecular level. 4. Student will understand about the mechanism, requirement and factors affecting the biochemical processes at all levels. 		
Unit – 1		15
Introduction to medical technology- Role of medical laboratory technologists, Ethics, Responsibilities, Safety urmeases , First aid (accidents).		
Unit – 2		15
Introduction to Glasswares: Cleaning and care of general laboratory glasswares and equipments. Preparation and storage of distilled water ,Analytical balance, Preparation of reagents and standard solutions, Storage of chemicals.		

Unit – 3	15
Units of Measurements: S.I. Units- Measurement of volumetric apparatus, (pipettes, flasks, cylinders), Calibration of volumetric apparatus.	
Radioisotopes: Introduction of Radioisotopes and their use in Biochemistry. Mole, molar and normal solutions, pH and pH measurement, buffer solutions, Osmosis, dialysis, surface tension.	
Unit – 4	15
Urine analysis: Qualitative sugar analysis for, sugar, proteins, bile pigments, ketone bodies, porpholinogen, faecal of blood.	
Unit – 5	15
Collection and recording of biological specimens: Separation of serum and plasma. preservation and disposal of biological samples material. Basic statistics (mean, SD, CV, normal distribution, probability. Normal or Reference range: Definition, influencing factors, Determination, Volumetric analysis- Preparation of standard acid and base solutions, chloride estimation	
Practical	
<ol style="list-style-type: none"> 1. To study different laboratory glassware. 2. To study analytical balance. 3. To study colorimeter. 4. To study flame photometer. 5. To study dialysis. 6. To prepare solution and reagents. 7. Urine analysis <ol style="list-style-type: none"> a) Determination of sugar. b) Determination of protein. c) Determination of bile salt. d) Determination of bile pigment. e) Determination of bile pigment and urobilinogen. f) Determination of ketone bodies 	
# Mode: Flipped Class Room, Case Discussion, Lectures.	
Suggested Reading:	
<ol style="list-style-type: none"> 1. Text Book of Biochemistry 4th edition – U. Satyanarayana and Chakrapani. 2. Text Book of Medical Laboratory Technology 5th edition – Praful B. Godkar. 3. Text Book of Medical Laboratory Technology 5th edition – Ramnik Sood. 4. District Laboratory Practice in Tropical Countries 3rd edition (vol. 1) – Monika Cheesbrough. 5. District Laboratory Practice in Tropical Countries 3rd edition (vol. 2) – Monika Cheesbrough. 	



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Department of Paramedical

SYLLABUS

Bachelor of medical laboratory technician (BMLT)

3 YEAR DEGREE COURSE

Year	BMLT 1st Year
Subject	Hematology – I
Time	75 Hrs

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Course code	Hematology – I	
BMLTE20Y104		
Pre-requisite	Nil	Syllabus version
Course Objectives:		
<ol style="list-style-type: none"> 1. To know the requirements, methods of analysis and differentiation of various samples in relation to pathology. 2. To differentiate between diseases at molecular, cellular and individual levels. 3. To learn about basic principles of instruments used in hematology lab. 4. To understand basic principles and method used for blood test. 5. To understand method of taking blood sample from vein puncture. 		
Course Outcome:		
<ol style="list-style-type: none"> 1. To know and understand every disease etiology and management. 2. To understand pathogenesis and ways to find out the cues of the diseases. 3. To know about symptoms and effects of various diseases. 4. To know the requirements, methods of analysis and differentiation of various samples in relation to pathology. 5. To differentiate diseases at molecular, cellular and individual levels. 		
Student Learning Outcomes (SLO):		
<ol style="list-style-type: none"> 1. Students will be able to develop knowledge of basic pathologic processes and skills needed to interpret. 2. Laboratory data as well as make clinic pathologic correlations. 3. Students will be able to promote the development of investigative skills to better understand pathologic processes as they apply to both individual patients and the general patient population. 4. Students will be able to perform an appropriate secondary/focused history and physical exam patients with medical complaints or signs and symptoms in the pre-hospital setting. 		
Unit – 1		15
Introduction to hematology and Laboratory Organization, Lab Safety and instrumentation, Formation of Blood, Composition and functions of blood.		

Unit – 2	15
Various anticoagulants, their uses, mode of action and their merits and demerits, Collection & Preservation of blood for various hematological investigations, Physiological Variations in, Hb, PCV, TLC and Platelet. Normal and absolute values in hematology. Quality assurance in hematology.	
Unit – 3	15
Haemoglobinometry, various methods of estimation of Hemoglobin, errors involved and standardization of instrument for adaptation Hemoglobin estimation. Hemocytometry, procedures for cell leucocytes and platelet counts. an error involved and means to minimize such errors. Romanowsky dyes, preparation and staining procedure of the blood smears.	
Unit – 4	15
Morphology of normal blood cells and their identification. Erythrocyte sedimentation rate, factors in influencing and various procedures for its estimation with their significance. Haematocrit value by macro and micro methods their merit and demerits. Routine examination of urine. Quality control of clinical investigations	
Unit – 5	15
Examination of biological fluids such as CSF, etc. Examination of semen.	
# Mode: Flipped Class Room, Case Discussion, Lectures.	
<ol style="list-style-type: none"> 1. Robbins & Cotran, Pathologic Basis & Diseases 2. Harsh Mohan, Pathologic Basis & Diseases 3. Todd & Sanford, Clinical Diagnosis by Laboratory Method 4. Dacie & Lewis, Practical Hematology 5. Ramanik Sood, Laboratory Technology Methods and Interpretation 	
Practical	
<ol style="list-style-type: none"> 1. Microscope 2. Hb%(Salis Method) 3. Hb%(Drakin's) Cyanmeth 4. Preparation of Slide and Staining Procedures Examination 5. Morphology of normal blood cells and identification 6. Total erythrocytes count 	

7. Total Leucocytes count
8. Differential leucocytes count
9. Platlet's Count
10. ESR ,PCV
11. Urine Routine Test, Physical, Chemical, and microscopy
12. CSF Examination
13. Semen Examination

PRACTICAL REFERENCE

1. Practical book Dacie & Lewis, Practical Hematology
2. Ramanik Sood, Laboratory Technology Methods and Interpretation
3. S.K Jain practical book,pathology
4. S.S Rao,practical Pathology,Laboratory Technology