Department of Biology

2025-2026

((Pathological analyses))

Stage (-3-)

LEC- ((1))

Laboratory Procedure

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Laboratory Safety Rules

1

Personal Protective Equipment

Proper use of gloves, lab coats, and other equipment to minimize the risk of exposure to hazardous substances.

2

Waste Disposal

Proper handling and disposal of biohazardous materials, such as used needles, contaminated glassware, and chemical waste.

3

Decontamination Protocols

Established procedures for cleaning and disinfecting work surfaces, equipment, and the overall laboratory environment.

4

Emergency Preparedness

Training and drills to ensure laboratory personnel are equipped to respond effectively to accidents or spills.

Laboratory Procedure

1

Specimen Collection

Obtaining biological samples, such as blood, urine, or tissue, from the patient.

2

Sample Processing

Preparing the specimen for analysis, including centrifugation, dilution, or staining.

3

Analytical Testing

Performing a variety of diagnostic tests to identify and quantify specific substances or organisms.

4

Result Interpretation

Analyzing the test results and comparing them to reference values.

Laboratory Glassware and Basic Equipment :

Pathological analytical laboratories require high-precision, durable, and cleanable tools for analyzing samples. The glassware used is typically borosilicate glass (e.g., Pyrex) due to its resistance to thermal shock and chemical corrosion.

Essential Glassware

Beaker : Cylindrical containers used for stirring, mixing, and heating liquids.

Volumetric Flask : Used for preparing solutions with high precision.

Conical Flask / Erlenmeyer Flask : Used for mixing, titration, and storing solutions, minimizing evaporation.

Graduated Cylinder : Used to measure liquid volumes with good accuracy.

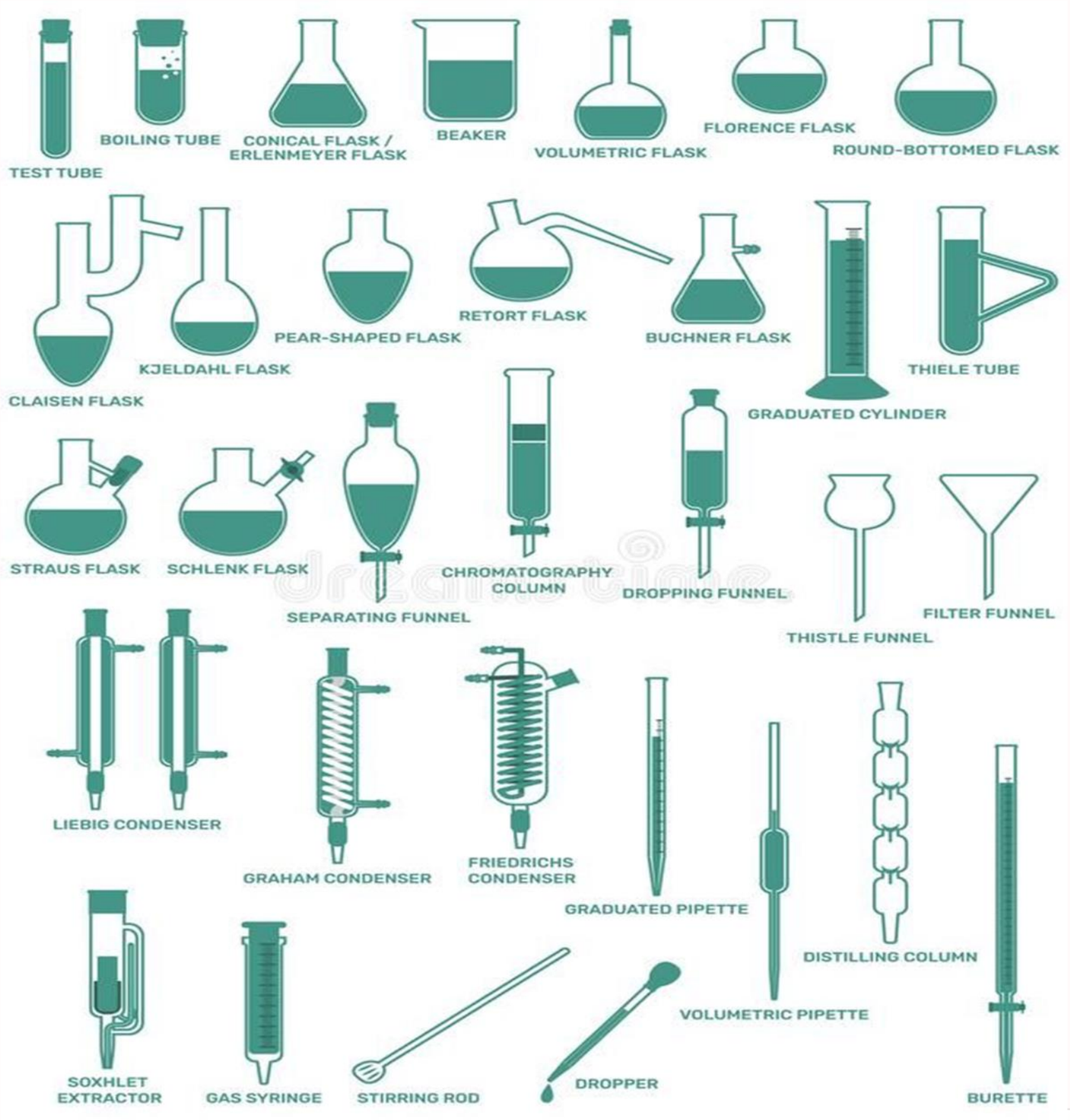
Pipette : Used to transfer precise volumes of liquids. Types include volumetric and graduated pipettes.

Burette : A long, graduated glass tube with a stopcock, used for titration.

Test Tube : Small tubes used for holding, mixing, or heating small quantities of liquids.

Petri Dish : Shallow cylindrical glass dish used to culture microorganisms.

Funnel : Used to transfer liquids into narrow-necked containers or for filtration.



Basic Equipment

1- Microscope: Essential for observing cells, tissues, and microorganisms.

2- Centrifuge: Separates blood or fluid components by density.

3- Hematology Analyzer: Counts and analyzes blood cells.

4- Chemistry Analyzer: Evaluates blood, serum, and body fluid samples.

5- Urinalysis Analyzer: Automates testing of urine samples.

6- PCR Machine/Molecular Analyzers: Used for DNA/RNA detection and genetic analysis.

7- Blood Gas/Electrolyte Analyzer: Measures specific blood chemistry parameters.

8- Autoclave: Sterilizes equipment and disposes of biohazardous waste.

9- Incubator: Maintains optimal temperature for growing cultures.

10- Refrigerator/Freezer: Preserves reagents, samples, and biological specimens.

Microscope

Centrifuges

Haematology Analysers

Biochemistry Analysers

PCR Machines

Slide Stainers

Tissue Processors

ELISA Readers

Incubators

Cryostats

Autoclaves

pH Meters

Microtomes

Refrigerators

Fume Hoods

Heat Blocks