NIGERIAN INSTITUTE OF SCIENCE LABORATORY TECHNOLOGY (NISLT)
Federal Ministry of Science and Technology (FMST)

MINIMUM REQUIREMENT FOR SETTING UP A PRIVATE SCIENCE LABORATORY

PREPARED BY

NIGERIAN INSTITUTE OF SCIENCE LABORATORY TECHNOLOGY

(A statutory professional body of laboratory technologists/scientists chartered by Act No 12 of 2003 of the National Assembly)

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BRIEF ON THE INSTITUTE

The Nigerian Institute of Science laboratory Technology (NISLT) was established by Act 12 of 2003 of the National Assembly and made a parastatal of the Federal Ministry of Science and Technology. The Institute was hitherto known as the Nigerian Institute of Science Technology NIST founded in 1971.

The core mandate of Nigerian Institute of Science laboratory Technology is to "advance science laboratory technology profession and ensure through its registered members effective and efficient management and administration of science laboratories in Nigeria."

In keeping with the mandate of the Institute as spelt out in the Act which among others include serving as a certifying agency through its registered members, the Institute has compiled the minimum requirements for operating a private science laboratory by certified practitioners of science laboratory technology. All practitioners are advised to set their private laboratories in with the stated conditions and invite the Institute for inspection and accreditation.

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REQUIREMENTS FOR PRIVATE PRACTICE IN SCIENCE LABORATORY TECHNOLOGY

The following conditions must be fulfilled by private science laboratory practitioners

- Acquisition of specialized knowledge in science laboratory technology in any relevant areas of the profession.
- Professional affiliation with the Nigerian Institute of Science Laboratory Technology for certification and license to practice.
- Identification and description of the nature and type of services to be offered.
- Registration with corporate affairs commission.
- Registration of private science laboratory with the Nigerian Institute of Science Laboratory Technology.

CONDITIONS FOR APPROVAL BY THE INSTITUTE

- ***Qualified and Competent Personnel***

  There must be full compliment of personnel with qualifications and experiences to support the type of services to be rendered.

- ***Physical Facilities/Structures***

  Physical facilities and structures available for the services must conform to standards. They include the laboratory building, which must be spacious with services like water, light, gas etc. Work benches and adequate a drainage system must be put in place.

- ***Standard Operating Procedure (SOP)***

  Standard Operating Procedures for each procedure and safety protocol must be provided

NISLT, Approved services in Private Chemical Laboratory

By the Act establishing the Institute, members of the profession are covered by law to render the following private services to the public with the registration and licence of the Institute.

1. Sampling and sample preparation
2. Qualitative and quantitative testing/analytical service
3. Auditing services
4. Training
5. Research
6. Handling and Disposal of chemical wastes
7. Water Analysis for
    - Routine chemical analysis for water and waste water include the following
    - pH
    - Electrical conductivity
    - Chemical Oxygen demand (COD)
    - Dissolved Oxygen (DO)
    - Total dissolved solids (TDS)
    - Alkalinity
    - Total acidity
    - Turbidity
    - Metals (including heavy metals)
    - Chloride
    - Nitrate and nitrite
    - Volatile organic compounds
    - Poly aromatic hydrocarbon
8. Soil analysis for
    - Organic carbon
    - pH
    - Total Nitrogen (N)
    - Nitrate

- Ammonium
- Ex changeable cations (Ca, Mg, K*, Na)
- Available phosphorus (P)
- Extractable micronutrients (Zn*, Mn, Fe,Cu)
- Heavy metals
- Pesticide residue
- Fertilizer
- Nitrogen
- Potassium
- Sulphate
- Metals
- Total Carbon (Organic fertilizers only)

9. Petroleum product for
    - Paraffin
    - Olefins
    - Naphthenes
    - Aromatics
10. Metals (especially Pb)
11. Sulphur
12. Plant and food analysis for
    - Protein
    - Crude fat
    - Crude fiber
    - Ash
    - Moisture
    - Vitamins
    - Minerals
    - Amino acids
    - Aflatoxin

13. Environmental analysis for
    - Emission monitoring
    - Air particulates
    - Factory effluents
    - Raw materials analysis
    - Total elemental composition
    - Purity
14. Pharmaceutical analysis
15. Determination of active ingredients and contaminants/impurities

Recommended Equipment and Materials (depending on the type of laboratory services provided)

Equipment

- Analytical balance
- pH meter
- Conductivity meter
- Flame photometer
- Atomic Absorption Spectrophotometer
- Nitrogen Determinator (Kjeltech 2300)
- UV/ Spectrophotometer
- Centrifuge Machine
- Mechanical shaker
- High Performance Liquid Chromatography
- Fourier Transform Infrared Spectrophotometer
- Oven
- Furnace
- Water Distiller
- Hydrometer

Materials

- Test tube
- Beaker
- Burette
- Pipette
- Reagent bottle
- Funnel
- Cuvette
- Volumetric flask
- Measuring cylinder
- Spatula
- Moisture can e.t.c

NISLT, Approved Services in physical Laboratory

By the Act establishing the Institute, members of the profession are covered by law to render the following private services to the public with the registration and licence of the Institute.

- Equipment Auditing/Accreditation
- Equipment Repair and Maintenance
- Equipment Specification
- Equipment Procurement / Acquisition
- Equipment Installations and Commissioning
- Fabrication and Design of Laboratory Equipment
- Training
- Dealership in Laboratory Equipment and Accessories
- Design and Construction of Laboratory
- Research and Consultancy

Types of laboratory under the physical sciences

- Computing laboratory
- Molecular laboratory
- Nanotechnology laboratory
- Quantum computing laboratory
- Biometrics laboratory
- Radiological laboratory
- Microelectronics integration
- Nuclear engineering laboratory
- Electrical & Electronics laboratory
- Maintenance & Management laboratory/workshop
- Physics laboratory
- Geophysics laboratory
- Geological laboratory, and a lot more.

S/N	List of Equipment /Tools for Physical Laboratory
1	Multiparameters (Analogue & Digital with complete accessories
2	Analogue/digital dual trace cathode ray oscilloscope
3	Function generator (Signal generator
4	Blower
5	Set of Allen key
6	Magnifying work lamp
7	Power supply and its connectors (AC/DC power supply
8	IC CHIP extractor
9	Non adjustable soldering iron
10	Grinding machine with spare stone
11	Electronic component box
12	Drilling machine with set of drilling bits
13	Vero-boards & bread boards
14	Complete tools box
15	Solder suckers/disordering pump
16	Soldering lead
17	60/40 lead solder rosin core
18	Soldering iron with station/station iron
19	Spectrum Analyzer
20	Crocodile clips
21	Speakers (8ohms)
22	Micrometer screw gauge
23	Vernier caliper
24	Measuring tape
25	Multipurpose screwdriver sets
26	Small circuit board holder
27	Set(s) of complete computer and its accessories, etc

BIOLOGICAL SCIENCES LABORATORY

The following areas are considered in the areas of Biological Sciences

- Microbiology
- Parasitology
- Virology
- Mycology
- Bacteriology
- Nematology
- Zoology
- Entomology
- Rhizobiology
- Immunoserology
- Physiology /Pharmacology
- Cytology
- Histology
- Histopathology

Objectives of Biological Laboratory

- Provision of quality-assured microbiological and environmental laboratory services
- Assist other laboratories in developing and strengthening their laboratory services
- Serve as a reference laboratory for difficult, unusual or otherwise unavailable
- laboratory procedures
- Serve as a resource of information on laboratory practice
- Test human and related specimens and environmental samples
- Assist in the development, evaluation and standardization of medical and environmental laboratory testing procedures
- Participate in special studies and research projects
- Provide refresher training and information updates

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NISLT APPROVED SERVICES IN PRIVATE BIOLOGICAL LABORATORY

By the Act establishing the Institute, members of the profession are covered by law to render the following private services to the public with the registration and licence of the Institute.

- Microbial count
- Biochemical test
- Serological test
- Antibody purification and characterization
- Polyclonal and monoclonal antibody production
- Widal test
- Blood grouping
- Genotyping

Examination of clinical and non clinical samples e.g. blood, sputum, urine, skin scraping and Stool microscopy

DNA analysis Using PCR

- Pathogenic study
- Identification of micro organism
- Genetic study or genetic disorder in human

Sensitivity test for micro organism

- Tests for indicator organisms and pathogens from various food commodities:
- Raw and pasteurized milk,
- Water and environmental samples;
- Environmental swabs and biosolids.
- Pathogen enumeration in foods and environmental samples.
- E. coli, coli form and aerobic colony counts
- Total microbial load of milk
- Alkaline phosphatase testing in milk and cheese to determine efficacy of pasteurization.
- Test on water, waste water and soil environmental samples
- Microscopy analysis

Microbiology Laboratory Equipment / Apparatus /Materials

	Equipment	
1	Autoclave	
2	Centrifuge	
3	Microscope	
4	Refrigerator / Freezer	
5	Incubator	
6	Laminar flow hood	
7	Weighing Balance	
8	UV Spectrophotometer	
9	Shaking water bath	
10	Laboratory blender	
11	Fume cupboard	
12	Desiccators	
13	PH Meter	
14	Oven	
15	Hot plate	
16	Colony Counter	
17	Haematocrit Machine and reader	

Apparatus / Material

1	Slide / cavity slide/cover slip	
2	Bunsen burner	
3	Spirit Lamb	
4	Conical flask	
5	Flat and round bottom flask	
6	Test tube/test tube holder	
7	McCartney bottles	
8	Reagent bottles	
9	Beakers	
10	Durham’s Tube	

Apparatus / Material contd.

11	Petri dishes i.e. Pyrex and disposable	
12	Spatula	
13	Lancet blade	
14	Filtration Apparatus	
15	Capillary tube	
16	Forceps	
17	Non-absorbent cotton wool	
18	Foil paper	
19	Inoculating loop	
20	Hand glove	
21	Multo disk	
22	Syringe and Needle	
23	Cork borer	
24	Wire basket for culture bottle and test tube	
25	Disinfectant	
26	Sterile swab	
27	Litmus paper	
28	Volumetric flask	
29	Measuring Cylinder	
30	Conical Flask	
31	Autometric Dispenser	

Staining Reagent

1	Crystal Violent	
2	Lugol's Iodine	
3	Absolute alcohol	
4	Dilute Carbon fuchsin	
5	Saframine	
6	Zichl – Neelseen's carbon fuchsine stain	

Staining Reagent contd.

7	Methylene blue stain	
8	Cotton blue-in-lactophenol	
9	Malachite green	
10	Leifson's stain	
11	Buffer solution	
12	Ethanol	
13	Saline solution	
14	Oil immersion	
15	Methylated Spirit	
16	Kovac reagent	
17	Sugar fermentation test reagent (sucrose, glucose)	

Culture Media

1	Nutrient Agar	
2	Dextrose Agar	
3	Blood Agar	
4	Eosin Methylene Blue	
5	Manitol salt Agar	
6	Diagnostic sensitivity Test Agar	
7	Muella – Hinton Agar	
8	Actinomycete Agar	
9	Milk protein – Hydrolysate Agar	
10	Nutrient Gelating medium	
11	Czapek Dox Agar	
12	Nutrient Gelating Medium	
13	Lactose Broth	
14	Starch Agar	
15	Typtone Broth	
16	Lead acetate Agar	
17	Yeast Extract glucose medium	

Culture Media Contd.

18	Malt extract Agar	
19	Milk Agar	
20	MacConkey Agar	
21	Malt extract broth	
22	Nutrient Broth	
23	Plate count Agar	
24	Crystal violet without salt	
25	Crystal violet with salt	
26	M-Endo Agar	
27	Listeria selective enrichment	
28	Muller Hinton Broth	