# AOU Medical Laboratory Science — Student Handbook (Part I)

B.MLS · MLSCN pathway · Courses, clinical attachments, pathways & assessment

**AKPAKIP ORO UNIVERSITY (AU)**

**Oro Nation, Akwa Ibom State, Nigeria**

**FACULTY OF MEDICAL SCIENCES**

**DEPARTMENT OF MEDICAL LABORATORY SCIENCE**

**STUDENT HANDBOOK**

**PART I**

**B.MLS Medical Laboratory Science**

**Leading to Eligibility for Licensure with the Medical Laboratory Science Council of Nigeria (MLSCN)**

**Your Guide to Courses, Weekly Topics, Coursework, Clinical/Practical Training and Assessment**

**Academic Structure: Five Years / Ten Semesters**

**Table of Contents**

## A. Welcome, Programme Goals and What You Will Achieve

### A.1 About This Handbook

This handbook is your guide to the B.MLS Medical Laboratory Science programme at Akpakip Oro University. It is built on the Nigerian Universities Commission (NUC) Core Curriculum and Minimum Academic Standards (CCMAS) and designed to prepare you for registration with the Medical Laboratory Science Council of Nigeria (MLSCN), in line with International Federation of Biomedical Laboratory Science (IFBLS) standards.

Teaching follows Outcome-Based Education (OBE): every course you take, every topic taught and every assessment you sit is designed to build toward the outcomes below.

### A.2 What You Will Be Able to Do By Graduation (Programme Educational Objectives)

### Within three to five years of graduating, you are expected to:

PEO1: Apply diagnostic laboratory science across haematology, microbiology, chemical pathology and histopathology to support accurate clinical diagnosis and patient management.

PEO2: Attain licensure with the Medical Laboratory Science Council of Nigeria (MLSCN) and progress into laboratory practice, laboratory management, or postgraduate study.

PEO3: Practise medical laboratory science with integrity, precision and ethical judgement grounded in African cultural values of dignity, empathy, inclusion and justice.

PEO4: Deliver reliable, quality-assured diagnostic services responsive to the disease patterns of Niger Delta and Gulf of Guinea populations.

PEO5: Engage in continuous, life-long learning and the responsible application of molecular diagnostics and emerging laboratory technologies throughout a professional career.

### A.3 Programme Outcomes — Your Graduate Attributes

### By the time you graduate, you will be able to demonstrate the following twelve outcomes:

No.

### Outcome

### Description

### HPO1

### Scientific and Clinical Knowledge

Apply the foundational biomedical, behavioural and clinical sciences relevant to the profession to safe, competent practice.

### HPO2

### Clinical/Professional Skills and Procedures

Perform the clinical, technical or professional procedures expected of a competent entry-level practitioner.

### HPO3

### Patient/Client-Centred Communication

Communicate effectively and compassionately with patients, clients, families and communities, respecting their autonomy and dignity.

**HPO4**

### Professionalism and Ethics

Practise with integrity, accountability and adherence to professional codes of ethics and regulatory requirements.

**HPO5**

### Population, Public and Community Health

Apply knowledge of population health, epidemiology and preventive practice to community and public health challenges.

**HPO6**

### Evidence-Based Practice and Research

Critically appraise and apply research evidence to inform practice, and conduct basic research under supervision.

**HPO7**

### Interprofessional Collaboration and Teamwork

Function effectively as a member of multidisciplinary healthcare and research teams.

**HPO8**

### Health Systems, Management and Leadership

Understand the organisation, financing and management of health systems, including resource-limited settings.

**HPO9**

### Cultural Competence and Health Equity

Practise with cultural sensitivity and attention to health equity, particularly within Niger Delta and Gulf of Guinea communities.

**HPO10**

### Health Informatics and Digital Technology

Use health information systems and digital/AI-enabled tools responsibly to support practice and decision-making.

**HPO11**

### Patient Safety and Quality Improvement

Apply patient/client safety principles and participate in continuous quality improvement.

**HPO12**

### Life-Long Learning and Professional Development

Engage in continuous, reflective, life-long learning and professional development.

## A.4 How to Use This Handbook

### For every semester, you should identify:

The courses you must register, with codes, credit units, status (Core/Elective) and prerequisites.

The main topics to be taught and their weekly sequencing.

Clinical, laboratory or practical activities you must attend.

Assignments and coursework you must complete.

Continuous assessment requirements.

Major examinations, projects and any specialisation/posting pathway you must declare.

What you should be able to do by the end of the course.

What you need to prepare for the next semester.

## A.5 Credit Units, Clinical Posting and Grading

One (1) credit unit is equivalent to one hour of lecture/tutorial contact per week, or two-to-three hours of laboratory/clinical contact per week, over a fifteen-week semester. Your indicative total load across the ten-semester programme is approximately 180-195 credit units. Clinical attachments and internship postings are compulsory, logged, and assessed Pass/Fail where indicated. Continuous assessment typically makes up 30-50% of your grade depending on the course, with the balance from end-of-semester or professional examinations.

## B.MLS Medical Laboratory Science

Delivered by the Department of Medical Laboratory Science, Faculty of Medical Sciences, leading to eligibility for licensure with the Medical Laboratory Science Council of Nigeria (MLSCN), with specialisation pathways in Haematology & Blood Transfusion, Medical Microbiology, Chemical Pathology, and Histopathology & Cytology.

### Programme Emphasis

The programme trains medical laboratory scientists competent in diagnostic testing across haematology, microbiology, chemical pathology and histopathology, meeting MLSCN requirements and aligned with international clinical laboratory standards (e.g. IFBLS), with particular attention to the diagnostic needs of the Niger Delta and Gulf of Guinea.

**Curriculum Structure — Semester-by-Semester Summary**

**Semester**

**Level**

**Academic Theme**

**Semester 1**

**100 Level, First Semester**

**Foundations of Medical Laboratory Science I**

**Semester 2**

**100 Level, Second Semester**

**Foundations of Medical Laboratory Science II**

**Semester 3**

**200 Level, First Semester**

**Core Laboratory Sciences I**

**Semester 4**

**200 Level, Second Semester**

**Core Laboratory Sciences II**

**Semester 5**

**300 Level, First Semester**

**Specialty Diagnostic Sciences I**

**Semester 6**

**300 Level, Second Semester**

**Specialty Diagnostic Sciences II**

**Semester 7**

**400 Level, First Semester**

**Specialised Laboratory Practice**

**Semester 8**

**400 Level, Second Semester**

**Research and Internship I**

**Semester 9**

**500 Level, First Semester**

**Research and Internship II**

**Semester 10**

**500 Level, Second Semester**

**Integrated Professional Readiness**

**Semester 1 — 100 Level, First Semester**

**Academic Theme: Foundations of Medical Laboratory Science I**

**Registered Courses**

**Code**

| Course Title | Units | Status | Prerequisite |
| --- | --- | --- | --- |
| GST 101 | Communication in English I | 2 | C | None |
| GST 103 | Nigerian Peoples and Culture | 2 | C | None |
| BIO 101 | General Biology I | 3 | C | None |
| CHM 101 | General Chemistry I | 3 | C | None |
| PHY 101 | General Physics I | 3 | C | None |
| STA 101 | Introductory Biostatistics I | 2 | C | None |
| MLS 101 | Introduction to Medical Laboratory Science | 2 | C | None |
| Total Units This Semester | | | |

**17**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Focus**

Foundational biology, chemistry, physics and biostatistics; orientation to the medical laboratory science profession.

**Coursework Requirements**

**Science problem sets and practicals**

**Biostatistics exercises**

**Career reflection essay**

**Semester 2 — 100 Level, Second Semester**

**Academic Theme: Foundations of Medical Laboratory Science II**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**GST 102**

**Communication in English II**

**2**

**C**

**GST 101**

**GST 104**

**Use of Library, Study Skills and ICT**

**1**

**C**

**None**

**BIO 102**

**General Biology II**

**3**

**C**

**BIO 101**

**CHM 102**

**General Chemistry II**

**3**

**C**

**CHM 101**

**PHY 102**

**General Physics II**

**2**

**C**

**PHY 101**

**MLS 102**

**Medical Laboratory Safety and Quality Assurance I**

**2**

**C**

**None**

**MLS 104**

**Introductory Human Anatomy and Physiology**

**3**

**C**

**BIO 101**

**Total Units This Semester**

**16**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Focus**

Chemistry and physics continuation; laboratory safety and quality assurance principles; introductory anatomy and physiology.

**Coursework Requirements**

**Chemistry/physics practicals**

**Laboratory safety checklist**

**Anatomy/physiology assignment**

**Semester 3 — 200 Level, First Semester**

**Academic Theme: Core Laboratory Sciences I**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 201**

**Human Anatomy and Physiology II**

**3**

**C**

**MLS 104**

**MLS 203**

**Medical Biochemistry I**

**3**

**C**

**CHM 102**

**MLS 205**

**General Microbiology**

**3**

**C**

**BIO 102**

**MLS 207**

**Haematology I**

**3**

**C**

**MLS 104**

**MLS 209**

**Immunology and Serology I**

**2**

**C**

**MLS 104**

**GST 201**

**Entrepreneurship Studies I**

**2**

**C**

**None**

**MLS 291**

**Clinical Attachment I**

**0**

**C**

**Pass/Fail, logged**

**Total Units This Semester**

**16**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Focus**

Anatomy/physiology continuation; biochemistry fundamentals; general microbiology; introductory haematology; immunology/serology; supervised clinical attachment begins.

**Coursework Requirements**

**Biochemistry practicals**

**Microbiology lab reports**

**Haematology practicals**

**Clinical attachment logbook**

**SIWES**

Students begin supervised clinical/laboratory attachment, in accordance with the approved placement arrangement.

**Semester 4 — 200 Level, Second Semester**

**Academic Theme: Core Laboratory Sciences II**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 202**

**Medical Biochemistry II**

**3**

**C**

**MLS 203**

**MLS 204**

**Medical Microbiology I (Bacteriology)**

**3**

**C**

**MLS 205**

**MLS 206**

**Haematology II**

**3**

**C**

**MLS 207**

**MLS 208**

**Histopathology Techniques I**

**2**

**C**

**None**

**MLS 210**

**Immunology and Serology II**

**2**

**C**

**MLS 209**

**GST 202**

**Entrepreneurship Studies II**

**2**

**C**

**GST 201**

**Total Units This Semester**

**15**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Focus**

Biochemistry continuation; bacteriology; advanced haematology; histopathology technique fundamentals; immunology/serology continuation.

**Coursework Requirements**

**Biochemistry practicals**

**Bacteriology lab reports**

**Haematology practicals**

**Histology slide preparation exercise**

**Semester 5 — 300 Level, First Semester**

**Academic Theme: Specialty Diagnostic Sciences I**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 301**

**Chemical Pathology I**

**3**

**C**

**MLS 202**

**MLS 303**

**Medical Microbiology II (Virology and Mycology)**

**3**

**C**

**MLS 204**

**MLS 305**

**Haematology III (Blood Transfusion Science)**

**3**

**C**

**MLS 206**

**MLS 307**

**Histopathology Techniques II**

**2**

**C**

**MLS 208**

**MLS 309**

**Medical Parasitology**

**3**

**C**

**MLS 205**

**MLS 391**

**Clinical Attachment II**

**0**

**C**

**Pass/Fail, logged**

**Total Units This Semester**

**14**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Focus**

Clinical chemistry fundamentals; virology and mycology; blood transfusion science; advanced histopathology technique; parasitology relevant to the region.

**Coursework Requirements**

**Chemical pathology practicals**

**Virology/mycology lab reports**

**Blood transfusion practicals**

**Parasitology practicals**

**Semester 6 — 300 Level, Second Semester**

**Academic Theme: Specialty Diagnostic Sciences II**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 302**

**Chemical Pathology II**

**3**

**C**

**MLS 301**

**MLS 304**

**Cytopathology**

**2**

**C**

**MLS 307**

**MLS 306**

**Clinical Microbiology**

**3**

**C**

**MLS 303**

**MLS 308**

**Molecular Diagnostics and Biotechnology**

**3**

**C**

**MLS 202**

**MLS-E1**

**Specialisation Elective (choose one; see options below)**

**3**

**E**

**Varies**

**Total Units This Semester**

**14**

**Specialisation / Pathway Options**

**Code**

**Option Title**

**MLT-A01**

**Haematology and Blood Transfusion Fundamentals**

**MLT-B01**

**Medical Microbiology Fundamentals**

**MLT-C01**

**Chemical Pathology Fundamentals**

**MLT-D01**

**Histopathology and Cytology Fundamentals**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Focus**

Advanced chemical pathology; cytopathology; clinical microbiology correlation; molecular diagnostics and PCR-based techniques.

**Coursework Requirements**

**Chemical pathology practicals**

**Cytology slide review**

**Clinical microbiology case study**

**Molecular diagnostics lab report**

**Semester 7 — 400 Level, First Semester**

**Academic Theme: Specialised Laboratory Practice**

Students formally declare one specialisation pathway at the start of Semester 7, carried through Semester 8: (A) Haematology and Blood Transfusion Science, (B) Medical Microbiology, (C) Chemical Pathology, or (D) Histopathology and Cytology.

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 401**

**Laboratory Management and Quality Systems**

**2**

**C**

**MLS 102**

**MLS 403**

**Research Methods in Medical Laboratory Science**

**2**

**C**

**None**

**MLS 405**

**Professional Ethics and Jurisprudence (MLSCN)**

**1**

**C**

**None**

**MLS 407**

**Advanced Clinical Chemistry**

**3**

**C**

**MLS 302**

**MLS 409**

**Public Health Microbiology**

**2**

**C**

**MLS 306**

**MLS 411**

**Laboratory Information Systems**

**2**

**C**

**None**

**MLS-P1**

**Pathway Course (choose track A, B, C or D)**

**3**

**E**

**Declared pathway**

**Total Units This Semester**

**15**

**Specialisation / Pathway Options**

**Code**

**Option Title**

**A - MLS 413**

**Advanced Blood Transfusion Science**

**B - MLS 415**

**Advanced Clinical Microbiology**

**C - MLS 417**

**Advanced Chemical Pathology**

**D - MLS 419**

**Advanced Histopathology and Cytology**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Fieldwork**

At least one supervised laboratory/field exercise relevant to the declared pathway shall be undertaken.

**Coursework Requirements**

**Quality systems audit exercise**

**Research proposal**

**Advanced clinical chemistry practicals**

**Pathway case study report**

**Semester 8 — 400 Level, Second Semester**

**Academic Theme: Research and Internship I**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 402**

**Research Project I**

**3**

**C**

**MLS 403**

**MLS 404**

**Internship/Clinical Posting I**

**4**

**C**

**None**

**MLS 406**

**Laboratory Safety and Biorisk Management**

**2**

**C**

**MLS 102**

**MLS-P2**

**Pathway Course (continuation of declared track)**

**3**

**E**

**Declared pathway**

**MLS 408**

**Seminar in Medical Laboratory Science**

**1**

**C**

**None**

**Total Units This Semester**

**13**

**Specialisation / Pathway Options**

**Code**

**Option Title**

**A - MLS 412**

**Transfusion Medicine Practicum**

**B - MLS 414**

**Clinical Microbiology Practicum**

**C - MLS 416**

**Clinical Chemistry Practicum**

**D - MLS 418**

**Anatomic Pathology Practicum**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Output**

Research project data collection begins; supervised internship/clinical posting in an accredited laboratory; biorisk management training.

**Coursework Requirements**

**Research project proposal defence**

**Internship logbook**

**Pathway practicum logbook**

**Semester 9 — 500 Level, First Semester**

**Academic Theme: Research and Internship II**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 501**

**Research Project II**

**3**

**C**

**MLS 402**

**MLS 503**

**Internship/Clinical Posting II**

**4**

**C**

**MLS 404**

**MLS 505**

**Advanced Molecular Diagnostics**

**2**

**C**

**MLS 308**

**MLS 507**

**Health Laboratory Policy and Regulation**

**2**

**C**

**MLS 401**

**MLS 509**

**Point-of-Care Testing and Emerging Technologies**

**2**

**C**

**None**

**Total Units This Semester**

**13**

**Weekly Scheme of Work**

**Weeks**

**Topics / Learning Activities**

**Focus**

Research project data analysis; continued internship; advanced molecular diagnostics; laboratory policy and regulation; point-of-care testing technologies.

**Coursework Requirements**

**Research project interim report**

**Internship logbook**

**Molecular diagnostics case study**

**Semester 10 — 500 Level, Second Semester**

**Academic Theme: Integrated Professional Readiness**

**Registered Courses**

**Code**

**Course Title**

**Units**

**Status**

**Prerequisite**

**MLS 502**

**Research Project III (Final Report and Defence)**

**3**

**C**

**MLS 501**

**MLS 504**

**Internship/Clinical Posting III**

**4**

**C**

**MLS 503**

**MLS 506**

**Professional Practice and Licensure Preparation (MLSCN)**

**2**

**C**

**MLS 405**

**MLS 508**

**Seminar in Medical Laboratory Science II**

**1**

**C**

**MLS 408**

**MLS 599**

**Final Qualifying Examination**

**0**

**C**

**Pass/Fail**

**Total Units This Semester**

**10**

**Weekly Scheme of Work**

**Weeks**

### Topics / Learning Activities

### Requirements

Complete and defend the research project; complete final internship/clinical posting; prepare for MLSCN licensure examination.

### Graduation Portfolio Requirements

### Transcript

### Clinical attachment and internship logbooks

### Research project report

### MLSCN licensure examination readiness record

### Professional development portfolio

### B. Your Weekly Study Model

### Plan your week across the following components:

Lectures — core teaching contact.

Tutorials — problem-solving and case discussion.

Laboratory/clinical/practical sessions.

Independent study — reading and revision.

Coursework — assignments, case reports and logbooks.

Group work — team-based case studies and ward/field exercises.

Maintain a personal Clinical Attachment Logbook and Professional Portfolio throughout your five years, consolidating practical reports, attachment evaluations and reflective notes. You will need this evidence for MLSCN licensure examination and registration.

### C. What a Normal Teaching Semester Looks Like

### A normal fifteen-week teaching semester generally follows this pattern:

### Week(s)

### What Happens

### Week 1

Orientation / course introduction.

### Weeks 2-5

Core theory and guided tutorials.

### Week 6

Continuous assessment / test.

### Weeks 7-10

Advanced theory plus laboratory/clinical/practical activities.

### Week 11

Practical/coursework assessment.

### Weeks 12-13

Integrated case-based/problem-based learning.

### Week 14

Revision and case presentations.

### Week 15

Final revision / course completion.

### Examination period

As separately published by the University.

### D. Recommended Textbooks and References

Use these as your core reading list across the programme. Your lecturers will indicate the specific chapters and editions relevant to each course in the weekly scheme.

### D.1 B.MLS Medical Laboratory Science

### Haematology and Blood Transfusion Science

Bain, B.J. — Dacie and Lewis Practical Haematology, Elsevier.

Hoffbrand, A.V. and Moss, P.A.H. — Essential Haematology, Wiley-Blackwell.

Mollison, P.L. — Blood Transfusion in Clinical Medicine, Wiley-Blackwell.

### Medical Microbiology and Parasitology

Murray, P.R., Rosenthal, K.S. and Pfaller, M.A. — Medical Microbiology, Elsevier.

Cheesbrough, M. — District Laboratory Practice in Tropical Countries, Cambridge University Press.

### Chemical Pathology and Clinical Chemistry

Burtis, C.A., Ashwood, E.R. and Bruns, D.E. — Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, Elsevier.

### Histopathology and Cytopathology

Bancroft, J.D. and Gamble, M. — Theory and Practice of Histological Techniques, Elsevier.

Bibbo, M. and Wilbur, D. — Comprehensive Cytopathology, Elsevier.

### Immunology, Molecular Diagnostics and Biotechnology

Abbas, A.K., Lichtman, A.H. and Pillai, S. — Cellular and Molecular Immunology, Elsevier.

### Laboratory Management, Quality and Professional Practice

Medical Laboratory Science Council of Nigeria (MLSCN) — Code of Professional Conduct, current edition.

CLSI — Clinical Laboratory Quality Management guidelines, current edition.

## E. Where to Get Further Help

This Student Handbook covers what you need to plan and succeed in each semester. Detailed course specifications, learning-outcome mapping and marking schemes for each course are held by your course lecturers in their course files, and can be requested from your Head of Department or Faculty Officer.