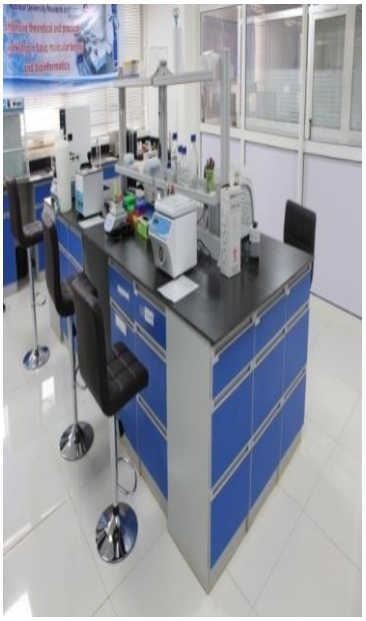
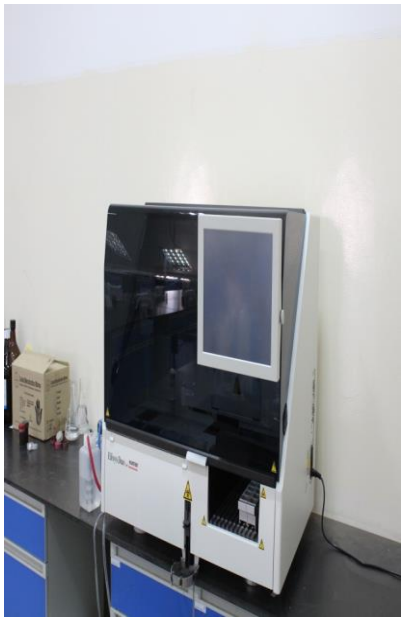
National University Sudan
Faculty of Graduate Studies and Scientific Research
Faculty of Medical Laboratory Sciences

M.Sc. Medical Laboratory Sciences
Microbiology and Infection Control

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Introduction

Medical Laboratory Scientists play a pivotal role in health care. They provide invaluable information for diagnosis, treatment and prevention of diseases. Though so important, the Medical Laboratory sector in Sudan experiences an acute shortage in qualified staff complying with the continuous advances and innovations in medical technologies vis-á-vis instrumentations and procedures.

For this, the faculty of Medical Laboratory Sciences of the National University, provides master programs by course in:

Chemical Pathology.
Microbiology and Infection Control.
Histopathology and Cytology.
Hematology and Immun Hematology.
Parasitology and Medical Entomology.

General objective

Qualify critical mass of Medical Laboratory staff to work in universities, research centers and in health care units.

Specific objectives

The program qualifies the candidates to:

- Describe microorganisms' (bacteria, viruses and fungi) cell strucures, nutrient requirments and metabolism.
- Use methods of sterilization and test their efficacy.
- Perform serological tests for diagnosis of bacterial, fungal and viral infections using the available laboratory facilities.
- Isolate and identify the pathogenic microorganisms and test their susceptibility to antibiotics.
- Determine the minimum inhibitory concentrations of antibiotics in body fluids.
- Adopt appropriate safety measures and maintain quality control in microbiology labs.
- Apply infection control program in hospitals and medical labs.

Learning outcomes

Upon graduation students will acquire:

- Advanced knowledge on bacteriology, mycology, virology, and immunology.
- Advanced practical skills for specimens collection, diagnosis and identifying appropriate antibiotics for treatment of infections.
- Basic and advanced knowledge and skills on infection control.

Admission requirements

- Applicants must satisfy the general regulations set by the faculty of graduate studies and scientific research of the National University- Sudan for registration for master degrees.
- Eligible candidates are holders of:

(a) B.Sc. **(**Honors) in Medical Laboratory Sciences in: Microbiology from the National University or from an equivalent University or a college.

(b) B.Sc. Medical Laboratory Sciences in Microbiology plus qulaifying or postgraduate diploma from the National University or from an equivalent University or a college.

Study program

Semester One

Code	Course	Credit hours	Contact hours/week	
			Theory	Practical
MIC-611	Medical Microbiology	3(2+1)	2	2
MIC-612	General Bacteriology	3(2+1)	2	2
MIC-613	Medical Mycology	4(3+1)	3	2
MIC-614	Diagnostic Virology	4(2+2)	2	4
MIC-615	Basic Infection Control	4(4+0)	4	0

Semester Two

Code	Course	Credit hours	Contact hours/week	
			Theory	Practical
MIC-621	Systemic Bacteriology	4(2+2)	2	4
MIC-622	Clinical Virology	4(4+0)	4	0
MIC-623	Advanced Techniques in Bacteriology	4(2+2)	2	4
MIC-624	Diagnostic Molecular Techniques in Microbiology	2(1+1)	1	2
MIC-625	Advanced Infection Control	4(3+1)	3	2

Semester Three

Code	Course	Credit Hours	Contact Hours	
			Theory	Practical
MIC-631	Dissertation	8(0+8)	0	16

Courses contents

MIC-611 Medical Microbiology
History of microbiology, taxonomy, growth, metabolism types of bacteria; Bacterial cell structure and physiology; Basic methods for isolation and identification of bacteria; Methods of sterilization and disinfection.

MIC-612 General Bacteriology
New techniques of microbiology: taxonomy, growth, metabolism types of bacteria; Bacterial cell structure and physiology; Basic methods for isolation and identification of bacteria; Methods sterilization and disinfection.

MIC-613 Medical Mycology
Examine the biology of true fungi and other organisms traditionally classified with the fungi: taxonomy, life history traits, ecology, physiology, and pathogenesis; Types of mycoses and evolutionary biology of major classes and orders of fungi; Impact of fungi on humans ; Identification of fungi in microbiology lab.

MIC-614 Diagnostic Virology
Definition, morphology, structure, replication, classification, and ways of causing virual diseases; Type of specimens taken for laboratory diagnosis; Methods for isolation of viruses: cell cultures, electron microscopy, serological and molecular.

MIC-615 Basic Infection Control
Sources of infection in the community and health institutions; Medical facilities; Disinfection and sterilization; Hand hygiene; Personal protective equipment; Contagious and contaminating materials; organisms transmitted from contacts with cntaminated materials; Identifying potential sources of infection in laboratory.

MIC-621 Systemic Bacteriology
Systemic infections; mechanism; path physiology; etiological agents and protocol of diagnosis; Specimens: collection and preservation; diagnosis techniques in bacteriology laboratories.

MIC-622 Clinical Virology
Description of clinical entities; Laboratory diagnosis; Prevention and control of some viral diseases: hepatitis, influenza, herpes, polio-AIDs and association with systemic infections.

MIC-623 Advanced Techniques in Bacteriology
Machines and advanced techniques for isolation and identification of bacterias; Antimicrobial sensitivity tests; Detection of resistant strains; use of molecular techniques for specific isolation of pathogenic bacteria.

MIC-624 Diagnostic Molecular Techniques in Microbiology
Machines and advanced techniques for molecular isolation and identification of microrganisms ; Detection of resistant strains using molecular techniques for specific isolation of microganisms

MIC-625 Advanced Infection Control
Sources of infection in communities; Types and sources of spreading pathogens; Outbreaks, surveillance and reporting of diseases; Basic knowledge on epidemiology apply effective infection control.

MIC-631 Dissertation
Write a research proposal; Conduct a piece of research: Data collection, analysis, interpretation and presentation. Dissertation writing: abstract, introduction, literature review, methodology, results, discussion, conclusions and recommendations, references. Dissertation assessment; Dissertation oral examination

Human resources and facilities

Teaching staff: Three assisstant professors
Three lecturers
Two lab technologists
One lab assisstant
One medical lab attendent

Facilities : Three lecture rooms : 70 seats each
Microbiology Laboratory: 60 seats
University main library: 400 seats.
E. Library: 250 seats.

Duration of the program: Three semesters: 16 weeks each

Teaching modules

Lectures, small group discussions, seminars, practicals, residential field training , tutorials and assignments.

Teaching language: English.

Examinations regulations

- Abide by the examinations rules of the general regulations of the graduate studies of the National University-Sudan
- A student failing any supplementary examination should repeat the course.
- A student scoring less than 60% in the theoretical and / or the practical comopnents of a specialization subject, should sit for a supplementary examination.
- Each student shall conduct a supervised piece of research.
- Duration of the research shall be 16 weeks. If need be, an extension of 4 weeks is allowed if approved by the program coordinator.
- Exceeding the aforementioned period (four weeks) the student has to settle a one semester extra feesto allow her/him an extention of extra four weeks.
- Expiring the extension periods without completing the dissertation, the student shall be dismissed from the program.
- A student scoring less than 60% in the dissertation oral examination will be allowed only one chance for oral defence. In such case the student should settle one semester fees.
- All students shall sit for oral examination at the end of the 3rd semester.

Assessment: Continuous assessment 30%
Final examination 70%

Grading system: A^+ (90-100) A (80-89) B^+(75-79) B (70-74) C^+(65-69) C(60-64) F (<60)

Award of the degree

The Scientific Council of the National University, based on the of recommendation of the board of the Faculty of Graduate Studies and Scientific Research, shall award the successful candidate

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