



الجامعة الوطنية - السودان
National University - Sudan

**M.Sc. Parasitology
and Medical
Entomology**





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-à-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:

- Acquire advanced knowledge in Parasitology, Medical entomology, Immunology and Molecular Parasitology.
- Identify human parasites, vectors and their relationships.

Learning outcomes

Upon graduation from the program, students will be able to:

- Perform parasitological tests for specimens in parasitology lab.
- Apply serological and molecular techniques for lab diagnosis of parasites.
- Appropriately handle and manage experimental animals.

Admission requirements

Applicants must satisfy the general regulations set by the faculty of graduate studies 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 qualifying 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
PAR-611	Biology and Metabolism of Parasites	3 (2+1)	2	2
PAR-612	Protozoology	3 (2+1)	2	2
PAR-613	Medical Entomology	3 (2+1)	2	2
PAR-614	Diagnostic Parasitological Techniques I	3 (2+1)	2	2
PAR-615	Experimental Parasitology	3 (2+1)	2	2
PAR-616	Evidence Based Practices in Parasitology	3 (3+0)	3	0

Semester Two

Code	Course	Credit hours	Contact hours/week	
			Theory	Practical
PAR-621	Helminthology	3 (2+1)	2	2
PAR-622	Immunoparasitology	3 (2+1)	2	2
PAR-623	Diagnostic Parasitological Techniques II	3 (2+1)	2	2
PAR-624	Advanced Parasitological Techniques	3 (2+1)	2	2
PAR-625	Molecular Parasitology	3 (2+1)	2	2
PAR-626	Epidemiology of Parasitic Diseases	3 (2+1)	2	2

Semester Three

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

Courses contents

PAR-611 Biology and Metabolism of Parasites

Description of the structure of the cellular properties, function and the chemical element of the parasite system especially protozoa; nutrition reproduction and metabolism of parasites and their ability to cause diseases.

PAR-612 Protozoology

Epidemiology: pathogenicity and management of protozoan infections; Archaeological evidence of protozoan infections; Biology of protozoan; Mode of transmission of parasitic infections; Diagnosis of protozoan infections; Protozoan infection and immune compromised host; Molecular genetics of malaria; Treatment options for protozoan infections; Mechanisms of anti-malarial drugs; Drug action and drug resistance; Current and potential approaches for protozoan infections control.

PAR-613 Medical Entomology

Concepts associated with vector-borne diseases and demographic and descriptive epidemiology; Overview of Medical Entomology; Trends in the evolution of arthropod vectors of diseases; Anthroponotic diseases; Venomous arthropods and their associated problems, psychogenic parasitosis; Application of Molecular Biology; Immunology and bioinformatics; Pesticides used in control of vectors; Forensic entomology.

PAR-614 Diagnostic Parasitological Techniques 1

Quality control in parasitology laboratory; Principles of light microscope; Principles of electron microscope; Principles of fluorescent microscope; Smears preparation and examination.

PAR-615 Experimental Parasitology

Handle and dissects lab models; Collection and inoculation of blood and other materials; Vaccination; Drug screening.

PAR-616 Evidence Based Practices in Parasitology

Research evidence; Posing the right questions; Searching the literature; Critical appraisal of the literature; Qualitative research appraisal; Systematic review; Meta-analysis, Developing evidence-based culture; Clinical evidence changing laboratory practice.

PAR-621 Helminthology

Overview of Medical Helminthology; Biology of helminthes; Patterns of larval development; Epidemiology and conditions leading to helminthic infections; Mode of transmission of helminthes infections; Impact of helminthic infections on human health; Role of immune system in producing the disease in helminthic infections; Tropical pulmonary eosinophilia; Common helminthic infections in children; Impact of helminthes co-infections with other parasitic infections; Diagnosis of helminthes; Diagnosis: light Microscope examination, immunological : ELISA and PCR.

PAR-622 Immunoparasitology

Immunological events during parasitic infection; Types of immune response and the main antigens of each parasite; cells involved in immune response; Escaping mechanism of the parasite; Immuno-pathology of the parasite; Basis of antigen preparation for parasitological uses; Principles of immunological techniques; Vaccination and prevention mechanism of parasitic infections.

PAR-623 Diagnostic Parasitological Techniques II

Advanced parasitological techniques; cultivation and preservation methods used to diagnose and / or maintain parasites of medical importance.

PAR-624 Advanced Parasitological Techniques

Collection, preservation and transport of specimens; Detection and identification of parasites; Recording results; Fixatives used to preserve parasitic elements in faces; Identification of adult intestinal worms.

PAR-625 Molecular Parasitology

Parasite genome structure and expression; Antigenic variability; genetics epidemiology and host-parasite interactions; Current molecular techniques used for identification of certain parasites: plasmodium, leishmania, trypanosoma, toxoplasma and schistosoma.

PAR-626 Epidemiology of Parasitic Diseases

Definition, nature and uses of epidemiology; Basic epidemiologic concepts; epidemiological terminology; Basic epidemiological studies.

PAR-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

Human resources:

- Three assistant professors
- Three lecturers; Two Technologists;
- One laboratory assistant
- One Medical lab attendant

Facilities:

- Three rooms: 70 seats each
- Parasitology lab: 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 components 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 fees to allow her/him an extension 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+ $\geq$ 90) (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, shall award the successful candidate

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