

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



**M.Sc. Medical Laboratory Sciences**  
**Haematology and Immunohaematology**



# **M.Sc. Medical Laboratory Sciences Haematology and Immunohaematology**

## **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**

To 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:

- Conduct advanced haematological tests for diagnosis and follow up of blood disorders.
- Run advanced coagulation tests to diagnose bleeding and thrombotic disorders.
- Perform all the serological tests necessary to provide safe blood and blood products.
- Perform blood fractionation.

## **Learning outcomes**

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

- Train and transfer knowledge to staff working in the laboratory settings
- Upgrade and efficiently manage the laboratory.
- Provide accurate diagnosis of blood
- Assure quality and abide by regulations of laboratory services.
- Write research proposals, conduct and evaluate the research projects in the field of Hematology and Immun Hematology.

## **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: Hematology and Immunochemistry from the National University or from an equivalent University or a college.
- (b) B.Sc. Medical Laboratory Sciences in Hematology and Immunochemistry 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 |
| HEM-611 | Benign Disorders of White Blood Cells    | 3(2+1)       | 2                   | 2         |
| HEM-612 | Malignant Disorders of White Blood Cells | 3(2+1)       | 2                   | 2         |
| HEM-613 | Red Blood Cells Disorders 1              | 3(2+1)       | 2                   | 2         |
| HEM-614 | Red Blood Cells Disorders II             | 3(2+1)       | 2                   | 2         |
| HEM-615 | Hemostatic System                        | 3(2+1)       | 2                   | 2         |
| HEM-616 | Bleeding and Thrombotic Disorders        | 3(2+1)       | 2                   | 2         |

#### Semester Two

| Code    | Course                                     | Credit hours | Contact hours/ week |           |
|---------|--|--------------|---------------------|-----------|
|         |  |              | Theory              | Practical |
| HEM-621 | Quality Assurance in Hematology            | 3(2+1)       | 2                   | 2         |
| HEM-622 | Automation in Hematology                   | 3(2+1)       | 2                   | 2         |
| HEM-623 | Blood Transfusion and Stem Cell Therapy    | 3(2+1)       | 2                   | 2         |
| HEM-624 | Hematological Changes in Systemic Diseases | 3(2+1)       | 2                   | 2         |
| HEM-625 | Hematology in Selected Populations         | 3(2+1)       | 2                   | 2         |
| HEM-626 | Molecular Hematology                       | 3(2+1)       | 2                   | 2         |

## Semester Three

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

### Courses contents

#### **HEM- 611 Benign Disorders of White Blood Cells**

Benign white cell disorders and causes; Lab diagnosis and follow-up; Application of the most up-to-date techniques.

#### **HEM- 612 Malignant Disorders of White Blood Cells**

Malignant white cell disorders and causes; Lab diagnosis and follow-up; Prognosis with application of the molecular, cytogenetic, cytochemical and immunological techniques.

#### **HEM- 613 Red Blood Cells Disorders I**

Red blood cells physiology and pathology; Routine and advanced investigations in diagnosis and follow-up of patients with anemias and other RBCs disorders.

#### **HEM- 614 Red Blood Cells Disorders II**

Hereditary and acquired hemolytic anemias; Aplastic anemia and polycythemia: routine and advanced investigations.

#### **HEM- 615 Hemostatic system**

Hemostatic mechanism: physiological and anatomical components.

#### **HEM- 616 Bleeding and Thrombotic Disorders**

Bleeding and coagulation disorders; Diagnose and monitor cases.

#### **HEM- 621 Quality Assurance in Hematology**

General and specific aspects of quality assurance and quality control in hematology lab.

#### **HEM- 622 Automation in Hematology**

Principles of cells counters ; Use and maintenance of automatic machines in hematology lab ; Interpretation of results

#### **HEM- 623 Blood Transfusion and Stem Cell Therapy**

Molecular basis; Biochemical basis; Detection methods of blood group antigens and hemopoietic stem cell biology; Perform compatibility tests prior to blood transfusion, bone marrow and solid organ transplantation.

#### **HEM- 624 Hematological Changes in Systemic Diseases**

Hematological manifestations of the systemic diseases: parasitic, bacterial, viral or autoimmune.

#### **HEM- 625 Hematology in Selected Populations**

Specific hematological aspects in pediatrics, geriatrics and pregnancy.

## **HEM- 626 Molecular Hematology**

Genetic and molecular bases of hematology ; Perform molecular diagnosis of hematological disorders.

## **HEM-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 assistant professors

Three lecturers

Two technologists

One lab assistant

**Facilities:** Three lecture rooms: 70 seats each

Hematology 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 and journal club, 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 an oral examination at the end of semester three.

**Assessment :** Continuous assessment: 30%  
Final examination: 70%

**Grading system:** A<sup>+</sup> (90-100) A (80-89) B<sup>+</sup>(75-79) B (70-74) C<sup>+</sup>(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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