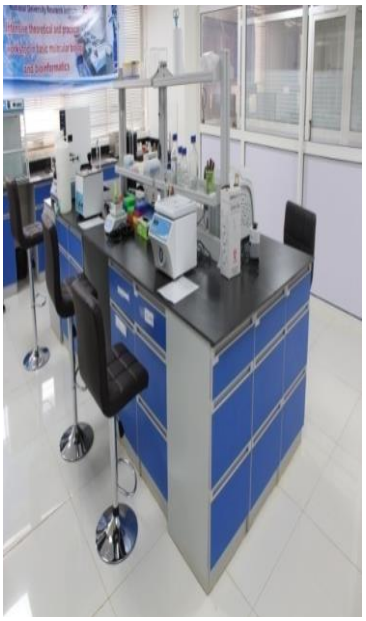
National University Sudan
Facultyof Graduate Studies and Scientific Research
Faculty of Medical Laboratory Sciences




M.Sc. Medical Laboratory Sciences
Histopathology and Cytology

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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 prepare tissues and cells for:

- Histopathogical and cytological techniques using light microscope .
- Immunological assessment of tissues by immunofluorescence and other immunohistochemical techniques.
- Cytogenetic and molecular techniques .
- Advance techniques in tissue transplantainon ,cell culture,and invitrofertilisation princible.

Learning outcomes

Upon successful completion of the program, the graduate shall be able to:

- Use basic and advanced histopathological techniques.
- Apply cytogenetic techniques for detection of abnormalities of tissues.
- Perform internal and external quality control in histopathology lab.
- Abide by standards of biosafety.

Admission requirements

- Applicants must satisfy the general regulations set by the facultyof 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: Histopathology and Cytology from the National University or from an equivalent University or a college.

(b) B.Sc. Medical Laboratory Sciences in Histopathology and Cytology 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
HIS-611	Histopathological Techniques	3(2+1)	2	2
HIS-612	Advanced Histopathological Techniques	3(2+1)	2	2
HIS-613	Immunohistochemisrty Techniques	3(2+1)	2	2
HIS-614	Immunofluorescent Techniques	3(2+1)	2	2
HIS-615	Cytology and Cytological Techniques in Non-Gynecology	3(2+1)	2	2
HIS-616	Cytology and Cytological Techniques in Gynecology	3(2+1)	2	2

Semester Two

Code	Course	Credit hours	Contact hours/week	
			Theory	Practical
HIS-621	Histopathological Diagnosis	4(3+1)	3	2
HIS-622	Cytogenetic and Molecular Techniques	4(3+1)	3	2
HIS-623	Tissue Transplantation Technology	4(3+1)	3	2
HIS-624	Cell Culture Technology	2(1+1)	1	2
HIS-625	Stem Cell Culture Technology	2(1+1)	1	2
HIS-626	In-vitro Fertilization Technology	2(1+1)	1	2

Semester Three

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

Courses contents

HIS-611 Histopathological Techniques
Tissue preparation for light microscopy; Histological preparations; Procedure of biopsy: grossing, fixation, processing, embedded, microtome sectioning; Preparation of routine stain heamatoxylen and eosin for routine work; Microtome sectioning and trouble shooting.

HIS-612 Advanced Histopathological Techniques
Spesial staining techniques and dye to idenentify different tissue disease carbohydrate (mucin ,glycogen),connective tissue (fiber and cell), pigments and lipids,nerve system,bone disease. tissue microarray techniques.Demonstration of microorganisms using to confirm the suspected microbial diagnosis.

HIS-613 Immunohistochemisrty Techniques
Localization of proteins in cells of a tissue section; Use of antibodies binding to antigen in biological tissues; Immunohistochemical staining to diagnose abnormal cells in cancerous tumors; Specific molecular markers characteristic of important cellular events proliferation or death.

HIS-614 Immunofluorecent Techniques
Diagnostic application of immunofleurecent in histopathology ,qualitative and quantitative detection of specific proteins in cells, culture, tissues, on microbeads and microarrays using fluorescence microscopy.

HIS-615 Cytology and Cytological Techniques in Non-Gynecology
Demonstration of benign and malignant changes on cells in non-gynecology; Cytological techniques used to demonstrate the changes on the cell under different circumstances.

HIS-616 Cytology and Cytological Techniques in Gynecology
Demonstration of benign and malignant changes on the cells in female genital tract; Cytological techniques used to demonstrate the changes on the female genital trract under different circumstances.

HIS-621 Histopathological Diagnosis
Selection of apt techniques for diagnosis of lesions and diseases in various body regions; Microscopic manifestations of acute and chronic inflammation; Appearance of necrosis ,fibrosis, cancer, healing and repair.

HIS-622 Cytogenetic and Molecular Techniques
Laboratory techniques and instrumentation for exploring cells genetics: Chromosomes (Cytogenetic), DNA and RNA (Molecular Genetics); Human specimens for investigations : blood, amniotic fluid, bone marrow, tumors and fibroblasts (including fetal tissue); Laboratory tests and procedures to provide critical information for acurate diagnosis, treat and monitor of patient's condition.

HIS-623 Tissue Transplantation Technology
Human organ transplantation; Careful monitoring of dooners and recipients; doners / recipients compliance; Dooner candidate selection: timing and careful management of patients waiting for transplanting; Rapid tests for evaluation and screening of donated organs . Matching of "extended criteria" of donors with appropriate recipients; Quantifying risks related to receiving organs; Government role in organs transplanting: regulations; support services.

HIS-624 Cell Culture Technology
Cell culture techniques with mammalian cell lines; Cells grown in culture; Methods for transforming and separating cells; Tissue culturing; Cell metabolism; Aging process; Effects of drugs and toxic compounds on the cells: mutagenesis and carcinogenesis.

HIS-625 Stem Cell Technology
Advanced histological techniques and immunocytochemistry; Identification of stem cells in human and animals; Instruction in theory and practical of the Procedures for identifying stem cells in different stages.

HIS-626 In-vitro Fertilization Technology
Core knowledge in the fundamental principles of reproductive science ;and the application of essential laboratory techniques in IVF ; Introduction and definitions; Concepts and principles of reproductive science; Application of essential laboratory techniques in IVF; Procedures for removing ova form ovary; Ova / sperms fertilization procedure in laboratory; Transfer of fertilized embryo (egg) to uterus.

HIS-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 resuorce and facilities

Teaching Staff: Three assisstant professors
Three lecturers
Two technologists
One lab assisstant
One lab attendent

Facilities: Three lecture rooms 70 seats each
Histopathology lab: 60 seats
University main library : 400 seatss
E.Library : 250 seats

Duration of the program: Three semesters 16 weeks each

Teaching Modules

Lectures, small groups 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 fees to allow her/him an extention of extra four weeks.
- 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.

- Expiring the extension periods without completing the dissertation, the student shall be dismissed from the program.
- All students shall sit for oral examination at the end of semester three.
- Having scores of less that 60% in defense (Discussion) will be considered as a failing score.

  As a result of paragraph 19, students will be obliged to pay semester fees.

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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