

جامعة الزيتونة للعلوم والتكنولوجيا

بكالوريوس التحاليل الطبية والعلوم المخبرية

Medical laboratory Sciences

خطة 2025

Plan 2025

1. Study Plan:

The curriculum for the Medical Laboratory Science program consists of **(138)** credit hours distributed as follows:

No.	Courses	CH
1	University Requirements (UR)	17
2	College Requirements (NHFR)	16
3	University Elective Courses	4
4	Specialization Course (Mandatory) (NHML)	101
Total		138

1.1 University requirements **(17)** credit hours distributed as follows:

رقم المساق	اسم المساق بالعربية	اسم المساق بالانجليزية	عدد الساعات المعتمدة	المتطلب السابق
UR00101	لغة عربية	Arabic Language	3	*
UR00111	لغة انجليزية	English Language I	3	*
UR00112	لغة انجليزية	English Language II	3	UR00111
UR00122	دراسات فلسطينية	Palestinian Studies	3	*
UR00122	مهارات رقمية	Digital and Computer Skills	1	*
UR00141	مهارات القيادة والاتصال	Leadership and communication skills	1	*
UR00121	حضارة	Culture and Civilization	3	*
	المجموع		17	

1.2 College requirements **(16)** credit hours distributed as follows:

رقم المساق	اسم المساق بالعربية	اسم المساق بالانجليزية	عدد الساعات المعتمدة	المتطلب السابق
NHFR110	الاحياء العامة	General Biology	3	*
NHFR112	الكيمياء العامة	General Chemistry	3	*
NHFR113/ETB S203	الكيمياء العامة عملي	General Chemistry Lab	1	تزامن NHFR112
NHFR131	الصحة العامة	Public Health	2	*
NHFR219	مقدمة في علم الأوبئة	Introduction to Epidemiology	2	*
NHFR220	مقدمة في الاحصاء الحيوي	Basic Math and Biostatistics of Health	2	*
NHFR126	أخلاقيات المهن الصحية	Quality, Safety & Ethics In Health	2	*
NHNS320	علم التغذية	Nutrition across human life span	1	*
NHFR222	مهارات انقاذ الحياة الأساسية	BLS	0	*

	16	المجموع
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1.3 University Elective Courses (The student chooses 4 hours):

رقم المساق	اسم المساق بالعربية	اسم المساق بالانجليزية	عدد الساعات المعتمدة	المتطلب السابق
NHNS226	المعلومات الصحية	Health Informatics	2	*
BASC439	اللغة العبرية	Hebrew Language	2	*
NHNS435	الانظمة والسياسات الصحية	Health system law & Policies	2	*

1.4 Specialization requirements (101) credit hours distributed as follows:

رقم المساق	اسم المساق بالعربية	اسم المساق بالانجليزية	عدد الساعات المعتمدة	المتطلب السابق
NHML121	الأحياء الطبية	Medical Biology for Health Sciences	2	NHFR110
NHML122	الأحياء الطبية عملي	Medical Biology Lab	1	تزامن NHML121
NHML123	كيمياء عضوية	Organic Chemistry	3	NHFR112
NHML124	كيمياء عضوية عملي	Organic Chemistry Lab	1	تزامن NHML123
NHML125	التشريح ووظائف الاعضاء	Human Anatomy for Medical Laboratories	3	NHFR110
NHML126	فسيولوجي	Human Physiology	3	NHFR110
NHML210	كيمياء حيوية	Biochemistry	3	NHML123
NHML211	علم انسجة	Histology	3	NHML125
NHML212	كيمياء تحليلية طبية	Analytical Chemistry	3	NHFR112/110
NHML213	كيمياء تحليلية طبية عملي	Analytical Chemistry Lab.	2	تزامن NHML212
NHML214	أحياء دقيقة طبية	Medical Microbiology	3	NHML121
NHML215	أحياء دقيقة طبية عملي	Medical Microbiology Lab.	2	تزامن NHML214
NHML220	مقدمة في علم الدم	Introduction to Heamatology	2	NHML121
NHML221	مقدمة في علم الدم عملي	Introduction to Heamatology Lab	1	تزامن NHML220
NHML222	أحياء جزيئية	Molecular Biology	3	NHML121
NHML223	علم المناعة والامصال	Immunology and Vaccination	2	NHML121/214/215
NHML224	فسيولوجيا الأمراض	Diseases Pathophysiology	2	NHML211
NHML225	علم الغدد الصماء	Endocrinology	2	NHML210
NHML310	كيمياء حيوية سريرية 1	Clinical Biochemistry 1	3	NHML210
NHML311	كيمياء حيوية سريرية عملي 1	Clinical Biochemistry 1 Lab.	1	تزامن NHML310
NHML312	أحياء دقيقة سريرية 1	Clinical Microbiology 1	3	NHML214/215
NHML313	أحياء دقيقة سريرية عملي 1	Clinical Microbiology 1 Lab.	2	تزامن NHML312
NHML314	علم المناعة التشخيصي والامصال	Diagnostic Immunology and Serology	2	NHML223

رقم المساق	اسم المساق بالعربية	اسم المساق بالانجليزية	عدد الساعات المعتمدة	المتطلب السابق
NHML315	علم المناعة التشخيصي والأمصال عملي	Diagnostic Immunology and Serology Lab.	1	تزامن NHML314
NHML316	علم امراض الدم التشخيصي 1	Diagnostic Heamatology 1	2	NHML220/221
NHML317	علم امراض الدم التشخيصي عملي 1	Diagnostic Heamatology 1 lab.	1	تزامن NHML316
NHML318	ندوات و مهارات تقديم النتائج	Seminar and presentation skills	1	50 CH
NHML380	تدريب ميداني 2	Clinical Training 1	3	*
NHML320	كيمياء حيوية سريرية 2	Clinical Biochemistry 2	3	NHML310
NHML321	كيمياء حيوية سريرية عملي 2	Clinical Biochemistry 2 Lab.	1	تزامن NHML320
NHML322	أحياء دقيقة سريرية 2	Clinical Microbiology 2	3	NHML214/215
NHML323	أحياء دقيقة سريرية عملي 2	Clinical Microbiology 2 Lab.	2	تزامن NHML322
NHML324	طفيليات طبية	Parasitology	3	NHML214
NHML325	طفيليات طبية عملي	Parasitology Lab.	1	تزامن NHML324
NHML326	علم امراض الدم التشخيصي 2	Diagnostic Heamatology 2	2	NHML220/221
NHML327	علم امراض الدم التشخيصي عملي 2	Diagnostic Heamatology 2 Lab.	1	تزامن NHML326
NHML381	تدريب ميداني 2	Clinical Training 2	3	*
NHML410	التحليل السريري و المجهري لسوائل	Body Fluids Clinical and Microscopic Analysis	3	NHML310/312
NHML411	التحليل السريري و المجهري لسوائل عملي	Body Fluids Clinical and Microscopic Analysis Lab.	1	تزامن NHML410
NHML412	علم الدم المناعي وبنك الدم	Immunohistochemistry and Blood Bank	1	NHML326
NHML413	علم الدم المناعي وبنك الدم عملي	Immunohistochemistry and Blood Bank Lab.	1	تزامن NHML412
NHML414	السلامة العامة في المختبرات الطبية ومكافحة العدوى	Lab Safety and Infection Control	2	NHML214/215
NHNS401	طرق البحث العلمي	Scientific research methodology	2	NHFR220
NHML480	تدريب ميداني 3	Clinical Training 3	3	*
NHML420	بيولوجيا جزئية تشخيصية ووراثة خلوية	Diagnostic molecular biology and cytogenetics	3	NHML222
NHML421	بيولوجيا جزئية تشخيصية ووراثة خلوية عملي	Diagnostic molecular biology and cytogenetics Lab.	1	تزامن NHML420
NHML422	علم السموم الجزيئي	Molecular Toxicology	2	NHML320
NHML423	الادارة وضبط الجودة في العلوم الطبية التطبيقية	Lab. Management and Quality Control	1	100 CH
NHML499	مشروع بحث التخرج	Graduation Project	2	100 CH
NHML500	تدريب ميداني نهائي	Interschip*	0	Department approval
	المجموع		101	

2. Courses' Description

رقم المساق	اسم المساق بالعربية	اسم المساق بالانجليزية	عدد الساعات المعتمدة	المتطلب السابق
NHFR110	أحياء عامة	General Bioloy	3	*
الوصف Description	This introductory course provides a comprehensive overview of fundamental biological principles. Topics include cell structure and function, genetics, evolution, biodiversity, ecology, and the physiology of the organism. Students explore the molecular basis of life, mechanisms of inheritance, and the interdependence of organisms within ecosystems. The course emphasizes scientific inquiry, critical thinking, and the application of biological concepts to real-world issues.			
NHFR112	كيمياء عامة	General Chemeistry	3	*
الوصف Description	This foundational course introduces the principles of chemistry, focusing on the structure and behavior of matter. It covers atomic theory, chemical bonding, stoichiometry, thermodynamics, kinetics, equilibrium, acids and bases, and basic electrochemistry. Students learn to apply scientific reasoning and analyze chemical data.			
NHFR113/ETBS2 03	كيمياء عامة عملي	General Chemeistry Lab	1	*
الوصف Description	This laboratory course complements the General Chemistry lecture by providing hands-on experience with core chemical concepts and techniques. Students conduct experiments that reinforce topics such as chemical reactions, stoichiometry, solution chemistry, thermodynamics, and acid-base behavior. Emphasis is placed on proper lab procedures, safety protocols, accurate data collection, and scientific analysis. Through collaborative work and formal lab reporting, students develop critical thinking and practical skills essential for scientific inquiry and future laboratory work.			
NHML121	الأحياء الطبية	Medical Biology for Health Sciences	2	NHFR110
الوصف Description	In this course, students are introduced to the basic principles of life and key biological terminology. Topics covered include basic scientific research skills, the characteristics, attributes, and classification of living organisms, the chemical foundations of life and the most important biochemical compounds, cell types and components and their mechanisms of action, the genetic basis of life, evolution, and identification of the different types of body tissues and their interaction to form organs and systems, as well as how these systems cooperate with each other to build the human body.			
NHML122	الأحياء الطبية عملي	Medical Biology Lab	1	تزامن NHML121
الوصف Description	This undergraduate laboratory course provides a foundational exploration of biological techniques relevant to medical science. Students will gain hands-on experience with core methods such as microscopy, cell culture, DNA/RNA extraction, gel electrophoresis, spectrophotometry, and basic immunoassays. Emphasis is placed on understanding the biological principles behind each technique and their applications in diagnosing and studying human diseases.			
NHML123	كيمياء عضوية	Organic Chemistry	3	NHFR112
الوصف Description	This course provides an in-depth study of the structure, properties, and reactivity of organic molecules. Topics include bonding and molecular structure, functional groups, stereochemistry, reaction mechanisms, and synthesis strategies. Students explore major classes of organic compounds such as alkanes, alkenes, alkynes, alcohols, ethers, carbonyls, and aromatic systems. Emphasis is placed on understanding reaction pathways, predicting products, and applying principles of spectroscopy (IR, NMR, MS) for structural analysis.			

NHML123	تزامن	1	Organic Chemistry Lab	كيمياء عضوية عملي	NHML124
This laboratory course offers practical experience in the techniques and procedures used in organic chemistry. Students perform experiments involving synthesis, purification, and characterization of organic compounds. Core techniques include distillation, extraction, recrystallization, chromatography, and spectroscopy. Emphasis is placed on reaction mechanisms, experimental design, proper lab documentation, and safety practices. Through hands-on work and analytical thinking, students gain the skills necessary to interpret data, troubleshoot procedures, and understand the real-world applications of organic chemistry.					الوصف Description
NHFR110		3	Human Anatomy for Medical Laboratories	التشريح ووظائف الاعضاء	NHML125
Study of the general structure of the body; the tissues, organs and systems. Detailed discussion of the anatomy of the skeletal, nervous, cardiovascular, lymphatic, digestive, respiratory, excretory & reproductive systems represent the core of this course.					الوصف Description
NHFR110		3	Human Physiology	فسيولوجي	NHML126
An introductory course exploring how major organ systems function to maintain human health. Topics include the nervous, muscular, cardiovascular, respiratory, renal, digestive, and endocrine systems. Students learn key physiological principles and regulatory mechanisms through lectures and problem-solving, building a foundation for medical and health-related fields.					الوصف Description
NHML123		3	Biochemistry	كيمياء حيوية	NHML210
This course introduces the chemical principles underlying biological systems, focusing on the structure and function of biomolecules, metabolic pathways, and enzyme mechanisms. Students will explore how molecular interactions drive cellular processes and learn foundational techniques used in biochemical research.					الوصف Description
NHML125		3	Histology	علم انسجة	NHML211
This course explores the microscopic structure of tissues and organs in the human body. Students examine the organization and function of the four basic tissue types - epithelial, connective, muscular, and nervous - along with specialized structures in major organ systems. Emphasis is placed on correlating histological features with physiological functions and clinical relevance.					الوصف Description
NHFR112/110		3	Analytical Chemistry	كيمياء تحليلية طبية	NHML212
This course covers the principles and techniques used to identify and quantify matter. Topics include classical methods like titration and gravimetry, as well as instrumental techniques such as spectroscopy, chromatography, and electrochemical analysis. Emphasis is placed on data interpretation, method validation, and real-world applications in environmental, pharmaceutical, and forensic sciences.					الوصف Description
NHML212	تزامن	2	Analytical Chemistry Lab.	كيمياء تحليلية طبية عملي	NHML213
This hands-on laboratory course introduces students to essential techniques in chemical analysis, including titration, spectroscopy, and chromatography. Emphasis is placed on precision, accuracy, data interpretation, and proper lab practices. Students gain practical experience in applying analytical methods to real-world samples.					الوصف Description
NHML121		3	Medical Microbiology	أحياء دقيقة طبية	NHML214
This course is an introductory in medical microbiology. Mainly, it explores and covers basic principles of bacteriology, in addition to introduction in virology, mycology, immunology and parasitology. It discusses the basic concepts of infection control in hospitals, sterilization and disinfection, the basics of infectious diseases in humans, microbial genetics, and specimen collection for the clinical microbiology laboratory. This course studies the basic characteristics of microorganisms. It focuses on the structure, physiology, growth, nutrition classification of microbes, microbial mode of infection, virulence, it examines the host/pathogen relationship					الوصف Description

(interaction) from both the standpoint of the pathogenic organism, the human host and the environment.				
NHML214	2	Medical Microbiology Lab.	أحياء دقيقة طبية عملي	NHML215
The course covers basic skills in Medical Microbiology laboratory that include culture media preparation, microbial culturing techniques, microbes staining and grouping.				الوصف Description
NHML121	2	Introduction to Heamatology	مقدمة في علم الدم	NHML220
This course introduces the study of blood and its components specifically the formed cellular elements including erythrocytes, leukocytes and thrombocytes. A detailed description of these elements will be provided with a major prospect on their generation, structure, function and metabolism. A considerable portion of the course will be directed to provide the students with an intensive specialized knowledge of the laboratory procedures for enumeration, examination and identification.				الوصف Description
NHML220	1	Introduction to Heamatology Lab	مقدمة في علم الدم عملي	NHML221
Students will be educated about the major routine examinations in diagnostic hematology laboratories that include complete blood count (CBC) and blood film examination. Students will learn how to conduct these examinations, understand their principles and interpret the results precisely.				الوصف Description
NHML121	3	Molecular Biology	أحياء جزيئية	NHML222
The course covers basics of Molecular Biology that include DNA and RNA structures, organization of the genome, DNA replication, DNA repair systems, DNA recombination, transcription, translation, regulation of gene expression and DNA biotechnology.				الوصف Description
NHML121/214/215	2	Immunology and Vaccination	علم المناعة والامصال	NHML223
This course explores the basic concepts, components and principles of the immune system. It studies human immunology and its applications in disease and diagnosis with focusing on specific and nonspecific immune response in addition to Major Histocompatibility Complex (MHC), principles theories of the immune response, principles and procedures of antigen antibody reactions and types of immunoglobulin (Ig) and their genes.				الوصف Description
NHML211	2	Diseases Pathophysiology	فسيولوجيا الأمراض	NHML224
Study the basic concepts in pathophysiology, cell injury, cell death and adaptation. Also, this course focuses on the description of Acute and chronic inflammation, repair, cell regeneration, fibrosis, wound healing and disorders of immune system. Furthermore, it emphasizes the pathophysiology of integumentary, cardiovascular, hematopoietic, lymphoid, respiratory, renal, gastrointestinal, endocrine, musculoskeletal and, nervous systems.				الوصف Description
NHML210	2	Endocrinology	علم الغدد الصماء	NHML225
The course covers fundamentals of endocrine glands and their hormones that include functions of endocrine glands, types of hormones, hormones assays and analysis, changes in hormone levels in endocrine disorders.				الوصف Description
NHML210	3	Clinical Biochemistry 1	كيمياء حيوية سريرية 1	NHML310
This course provides a foundational understanding of clinical chemistry, focusing on the biochemical principles and laboratory techniques used in the analysis of body fluids for diagnostic and therapeutic purposes. Students will explore the physiological basis of various biochemical parameters, their clinical significance, and the interpretation of laboratory results in the context of human health and disease.				الوصف Description

NHML310	1	Clinical Biochemistry 1 Lab.	كيمياء حيوية سريرية عملي 1	NHML311
This hands-on laboratory course complements theoretical studies in clinical biochemistry by providing practical experience in the techniques and procedures used to analyze biological specimens. Students will learn to operate laboratory instruments, perform biochemical assays, and interpret results in the context of clinical diagnostics. Emphasis is placed on precision, accuracy, safety, and the clinical relevance of laboratory findings.				الوصف Description
NHML214/215	3	Clinical Microbiology 1	أحياء دقيقة سريرية 1	NHML312
The study of microorganism classifications, taxonomy, and properties. A great range of species is discussed with emphasis on human pathogens, virulence factors and pathogenesis. The course also covers theoretical aspects regarding microorganism growth, isolation, identification, antibiotic susceptibility testing, and special anaerobic procedures.				الوصف Description
NHML312	2	Clinical Microbiology 1 Lab.	أحياء دقيقة سريرية عملي 1	NHML313
The application of various microbiology skills leading to the identification of bacterial species and especially human pathogens. This includes the performance of bacterial culture, bacterial isolation, biochemical testing, proper sample and media handling, antibiotic susceptibility testing, and proper application of safety protocols and waste management procedures.				الوصف Description
NHML223	2	Diagnostic Immunology and Serology	علم المناعة التشخيصي والأمصال	NHML314
This course is an applied clinical immunology and serology for clinical laboratory practice and it covers essential theoretical principles along with serology techniques most commonly used in the lab. It provides students with knowledge to perform different serological techniques used in disease diagnosis. It consists of the theory, application and technical performance of common serological testing used in a clinical lab.				الوصف Description
NHML314	1	Diagnostic Immunology and Serology Lab.	علم المناعة التشخيصي والأمصال عملي	NHML315
This course provides a comprehensive introduction to the principles and practices of diagnostic serology, focusing on the detection and interpretation of antigen-antibody reactions in clinical settings. Students will explore the immunological basis of serological testing and gain hands-on experience with techniques used to diagnose infectious diseases, autoimmune disorders, and other immunologically mediated conditions.				الوصف Description
NHML220/221	2	Diagnostic Hematology 1	علم أمراض الدم التشخيصي 1	NHML316
The course aims to provide the students with a prospect of the common hematological abnormalities (disorders) that affect red blood cells and platelets. These disorders will be extensively discussed with major emphasis on Etiology and classifications, cellular and molecular pathogenicity, clinical features and diagnostic impacts starting from the routine examination of CBC and blood film exam ending up with specialized confirmatory examinations that aid in both the diagnosis of these disease, treatment regimen and follow their prognosis.				الوصف Description
NHML316	1	Diagnostic Hematology 1 lab.	علم أمراض الدم التشخيصي عملي 1	NHML317
Students will be reviewing clinical cases from patients with hematological disorders that affect the red cells and platelets. The routine examinations and special diagnostic impacts will be studied accordingly.				الوصف Description
50 CH	1	Seminar and presentation skills	ندوات و مهارات تقديم النتائج	NHML318
This course is designed to develop students' confidence and competence in academic and professional communication. It focuses on the principles and practices of effective oral presentations, including structure, visual aids, audience engagement, and delivery techniques. Students participate in seminars, prepare and present up-to-date subjects/publications, and receive constructive feedback to refine their speaking style.				الوصف Description
*	3	Clinical Training 1	تدريب ميداني 2	NHML380

Clinical laboratory practice in affiliated hospital laboratories, under supervision in hematology, blood bank laboratories, clinical chemistry, clinical microbiology laboratories, clinical microscopy, clinical immunology and serology, laboratory morning reports, test performance, isolation, and identification.				الوصف Description
NHML310	3	Clinical Biochemistry 2	كيمياء حيوية سريرية 2	NHML320
This advanced-level course gives deeper insight into the biochemical and molecular mechanisms underlying human health and disease, with a focus on complex analytical techniques and clinical applications. Students will explore the pathophysiology of major organ systems, advanced diagnostic markers, and emerging technologies in clinical chemistry.				الوصف Description
NHML320	1	Clinical Biochemistry 2 Lab.	كيمياء حيوية سريرية عملي 2	NHML321
This advanced laboratory course builds upon foundational clinical biochemistry skills, offering in-depth training in sophisticated analytical techniques and complex diagnostic assays. Students will engage in high-level biochemical testing, data interpretation, and problem-solving using real and simulated clinical cases.				الوصف Description
NHML214/215	3	Clinical Microbiology 2	أحياء دقيقة سريرية 2	NHML322
Studying different methods and techniques applied for the diagnosis of pathogenic microorganisms isolated from different clinical specimens including microorganism growth, isolation, and identification. The courses utilizes human body-system based study of human pathogens. Course includes signs and symptoms of infections, protocols for proper sampling and handling of clinical material, procedures for identification of pathogens, and other microbiology testing techniques.				الوصف Description
NHML322	2	Clinical Microbiology 2 Lab.	أحياء دقيقة سريرية عملي 2	NHML323
The proper handling of various types of clinical samples. The application of appropriate microbiology tests and protocols toward the identification of pathogens. This includes basic and advanced microbiology skills such as bacterial culture, biochemical testing, antibiotic susceptibility testing, and other special tests.				الوصف Description
NHML214	3	Parasitology	طفيليات طبية	NHML324
Students will study the various parasites of medical importance that cause diseases in humans, their structures, life cycles, diseases they cause, treatments, in addition to laboratory diagnosis, prevention, and control.				الوصف Description
NHML324	1	Parasitology Lab.	طفيليات طبية عملي	NHML325
Students will gain skills on how to process clinical specimens for the detection of parasites. This includes concentration and staining techniques, and microscopical examination for the identification of various parasitic stages.				الوصف Description
NHML220/221	2	Diagnostic Hematology 2	علم امراض الدم التشخيصي 2	NHML326
The course aims to provide the students with a prospect of the common hematological abnormalities (disorders) that affect white blood cells (leukocytes). Both benign and malignant disorders will be studied and extensively discussed with major emphasis on Etiology and classifications, cellular and molecular pathogenicity, clinical features and diagnostic impacts starting from the routine examination of CBC and blood film exam ending up with specialized confirmatory examinations that aid in both the diagnosis of these diseases, treatment regimen and follow their prognosis.				الوصف Description
NHML326	1	Diagnostic Hematology 2 Lab.	علم امراض الدم التشخيصي عملي 2	NHML327
Students will be reviewing clinical cases from patients with hematological disorders that affect leukocytes. The routine examinations and special diagnostic impacts will be studied accordingly.				الوصف Description
*	3	Clinical Training 2	تدريب ميداني 2	NHML381

Clinical laboratory practice in affiliated hospital laboratories, under supervision in hematology, blood bank laboratories, clinical chemistry, clinical microbiology laboratories, clinical microscopy, clinical immunology and serology, laboratory morning reports, test performance, isolation, and identification.				الوصف Description
NHML310/312	3	Body Fluids Clinical and Microscopic Analysis	التحليل السريري و المجهرى لسوائل	NHML410
Theoretical aspects of microscopic and biochemical techniques in the analysis human body samples and fluids including urine, stool, cerebrospinal fluid (CSF), seminal fluid, synovial fluid, pleural, peritoneal fluid, and others.				الوصف Description
NHML410 تزامن	1	Body Fluids Clinical and Microscopic Analysis Lab.	التحليل السريري و المجهرى لسوائل عملي	NHML411
Practical application of microscopic and biochemical techniques in the analysis of human body samples and fluids including urine, stool, cerebrospinal fluid (CSF), seminal fluid, synovial fluid, pleural, peritoneal fluid, and others.				الوصف Description
NHML326	1	Immunohistochemistry and Blood Bank	علم الدم المناعي وبنك الدم	NHML412
The course intends to educate the students about the necessity and the technical procedures of performing safe blood donation and transfusion. The student will learn all blood transfusion requirements starting from blood donation to testing donated blood for compatibility and infectious pathogens. Blood donation will be extensively studied and practiced gaining the optimal levels of experience and knowledge in the field.				الوصف Description
NHML412 تزامن	1	Immunohistochemistry and Blood Bank Lab.	علم الدم المناعي وبنك الدم عملي	NHML413
The course intends to educate the students about the practical procedures of performing safe blood donation and transfusion. The students will know how to perform blood transfusions starting from blood donation to testing donated blood for compatibility and infectious pathogens.				الوصف Description
NHML214/215	2	Lab Safety and Infection Control	السلامة العامة في المختبرات الطبية ومكافحة العدوى	NHML414
The course covers topics related to safety in medical laboratories such as management of hazardous medical waste, infection control, storage of medical materials and care of medical instruments.				الوصف Description
NHFR220	2	Scientific research methodology	طرق البحث العلمي	NHNS401
The course provides students with knowledge regarding scientific methods of problem solving and includes: performing literature review, asking scientific questions, hypothesis stating, study objectives, study designs, Data collection and analysis, grant proposal writing, and report writing.				الوصف Description
*	3	Clinical Training 3	تدريب ميداني 3	NHML480
Clinical laboratory practice in affiliated hospital laboratories, under supervision in hematology, blood bank laboratories, clinical chemistry, clinical microbiology laboratories, clinical microscopy, clinical immunology and serology, laboratory morning reports, test performance, isolation, and identification.				الوصف Description
NHML222	3	Diagnostic molecular biology and cytogenetics	بيولوجيا جزيئية تشخيصية ووراثة خلوية	NHML420
This course explores tools used for molecular diagnosis of diseases including inherited diseases, infectious diseases, and cancer. This involves amplifying DNA; nucleic acid hybridization; genetic testing (ARMS, RFLP-PCR, RT-PCR, HPLC, SSCP, competitive oligopriming and others); DNA sequencing; cell cycle and diagnostic cytogenetic techniques. In addition, basic patterns of inheritance, pedigrees and inherited diseases will be covered.				الوصف Description

NHML420 تزامن	1	Diagnostic molecular biology and cytogenetics Lab.	بيولوجيا جزيئية تشخيصية ووراثة خلوية عملي	NHML421
Students will gain hands-on experience in both molecular and cytogenetic laboratory methods, learning to perform, interpret, and troubleshoot diagnostic assays. The course integrates theoretical knowledge with practical skills, preparing students for real-world clinical and research environments.				الوصف Description
NHML320	2	Molecular Toxicology	علم السموم الجزيئي	NHML422
This course explores molecular actions of toxicants and mechanisms of their adverse health effects. The students are expected to develop a broad understanding of xenobiotics metabolism, biomarkers of toxicity, animal models of toxicology, techniques used in detection of toxicant and molecular changes caused by environmental chemicals and toxicants.				الوصف Description
100 CH	1	Lab. Management and Quality Control	الادارة وضبط الجودة في العلوم الطبية التطبيقية	NHML423
Through this course, students learn the administrative tasks of the laboratory and how to manage a medical laboratory efficiently and effectively. The course covers the following topics: the administrative role of the medical laboratory director and the primary laboratory manager. It also covers planning, organization, decision-making, problem-solving, staffing, laboratory design, purchasing, understanding modern equipment and management methods, quality control, and the economic feasibility of laboratory work. This course aims to teach students how to operate laboratories efficiently and effectively.				الوصف Description
100 CH	2	Graduation Project	مشروع بحث التخرج	NHML499
During this course, each group of 3-5 students conducts a comprehensive scientific study on a topic related to medical laboratories, with the assistance of a faculty supervisor, using all available resources at the university. Upon completion, the students write a comprehensive scientific report discussing the results and presenting it to the faculty and audience.				الوصف Description
Department approval	0	Intership*	تدريب ميداني نهائي	NHML500
This final-stage internship provides students with supervised, hands-on experience in clinical laboratory settings, bridging academic learning with professional practice. Interns rotate through key departments such as hematology, microbiology, clinical chemistry, immunology, and molecular diagnostics. Emphasis is placed on mastering laboratory techniques, adhering to quality control standards, interpreting diagnostic results, and maintaining patient confidentiality. The internship fosters professional development, critical thinking, and readiness for certification and employment in medical laboratory science.				الوصف Description