PROGRAMME SPECIFICATION

(Postgraduate MD degree of Medical Microbiology and Immunology)

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Programme Title & Code	- Postgraduate MD degree of Medical Microbiology and Immunology - **Code: MIC607**
(2) Final award/degree	MD degree
(3) Department (s)	Medical Microbiology and Immunology
(4) Coordinator	**Dr. Dalia Moemen** **Dr. Walid El-Dars**
(5) External evaluator (s)	**Prof. Mohammed Saleh**
(6) Date of approval by the Department`s council	7/8/2016
(7) Date of last approval of programme specification by Faculty council	9/8/2016

(B) Professional information

(1) Programme Aims:

The broad aims of the Programme are as follows:

The overall aim of the course is to:

1- Produce health science professionals and in-depth medical and microbiological knowledge of different emerging infectious disease
2- Train microbiologist to be able to perform medical microbiology and immunology
3- Promote our students to practice health care associated infection monitoring and prevention in academic and clinical settings.
4- Provide our candidate with the ability to apply different and recent molecular biological and immunological techniques in the field of microbiology
5- Give the candidate the ability to assess immunological status in different pathological condition with gaining knowledge about immunological role in development of different disease and how to target by immunotherapy
6- Provide opportunities to gain research capacity and publish scientific relevant studies.

(2) Intended Learning Outcomes (ILOs):

Intended learning outcomes (ILOs); Are four main categories: knowledge & understanding to be gained, intellectual qualities, professional/practical and transferable skills.

On successful completion of the programme, the candidate will be able to:

A- Knowledge and Understanding:

A1 Recognize the DNA fingerprinting and its applications in diagnosis of bacterial infections, bacterial resistance, taxonomy of bacteria and preparation of bacterial vaccines.

A2 Describe the control of cell cycle, the idea of epigenetics, metagenomics and genome coding strategies.

A3 Identify the Gene therapy, molecular mechanism of antibody class switch, and the engineered antibodies, in addition to identifying the molecular genetic techniques widely used in evaluating the immune system and in histocompatibility testing.

A4 Outline the idea of transforming genes (oncogenes), transposons, retrotransposons, reverse transcription (e.g. Retroviruses) and molecular mechanisms of HCV resistance to INF antiviral therapy.

A5 Outline the molecular techniques used in diagnosis of fungal infections and the emerging resistance to antifungal agents.

A6 Characterization of morphology, antigenic structure of bacteria, their virulence factors, their physiology and metabolism, and host parasite relationship. In addition, nomenclature and classification of microbes.

A7 Mention the principles and the different methods of sterilization and disinfection.

A8 List the antibacterial agents used in treatment of infections, spectra of activity, their mechanisms of action, and the different mechanisms of antimicrobial drug resistance.

A9 Describe the basic structure of nucleic acid ,identify the mechanism of DNA replication, transcription, translation of DNA , identify DNA repair mechanisms , the methods of gene transfer among bacteria and identify the basics of the different molecular biology techniques.

A10 Recognize the normal immune system, the mechanisms and components of innate, humoral and cell mediated immune response and the hypersensitivity reactions, recognize antigens and its presentation.

A11 Recognize the clinical immunology such as Immunodeficiency diseases, immune tolerance and principles of autoimmunity, basics of transplantation and tumor immunity

A12 Describe the structure, pathogenesis, mode of transmission of DNA and RNA viruses with emphasis on the clinical picture and laboratory diagnosis of diseases caused by each

A13 Recognize the modes of transmission, pathogenesis of viral diseases and their control.

A14 Outline the general properties and classification of fungi and list opportunistic fungi of medical importance, fungi causing superficial, subcutaneous, cutaneous and endemic mycoses.

A15 Recognize the ultra-structure of bacteria, pathogenesis of intracellular bacteria, bacterial biofilm, role of bacteria in oncogenesis, emerging and reemerging bacteria, and endemic diseases caused by it.

A16 Elicit he role of bacterial enzymes in medicine.

A17 To recognize the role of immune system in rheumatoid arthritis, and cancer. Also, describe immunotherapy for them (e.g. NK cells as a guide control of cancer).

A18 To recognize the mucosal immune system, its components, their vaccines, apoptosis, its mechanisms, and its role in health and disease.

A19 Know the tools for next generation sequencing, applications of bacterial transformation, and bacterial mapping techniques.

A20 Recognize dermatophytes, Fungi causing nosocomial fungal infection, fungal allergy, disseminated fungal infection, fungal infection in HIV, cancer, and pediatric patients. Outline new fungal vaccines.

A21 Recognize the role of microvesicles in viral infections, Kaposi's sarcoma encoded interferon factors in inflammatory response and cancer, new methods to design an antiviral agent, and role of single nucleotide polymorphism in response to interferon therapy.

A22 Discuss prevention of device related infection, isolation policies, collection and interpretation of surveillance data, and air contamination (sources, effect on health, and internationally accepted standards of air microorganisms). Also, list important points in lab. Design

A23 Describe vaccine Preventable diseases, different types of vaccines, advantages and disadvantages recent methods of preparation and the role of genetic engineering in its development.

A24 Recognize characters, different types, pathogenesis, recent methods diagnosis and treatment of Mycobacteria.

B- Intellectual skills:

B1 Assess the advantages of individual methods of molecular diagnosis for diagnosis of infections and Interpret the results of molecular diagnostic techniques.

B2 Analyze and explain the pitfalls encountered in PCR results and Interpret the results of DNA fingerprinting. Analyze and explain the results of next generation sequencing and bacterial mapping techniques.

B3 Differentiate between infection, colonization, contamination, and detect the proper typing method that can be used for investigation of outbreaks.

B4 Recognize the antibiotic of choice for treatment of each type of bacterial infection, Explain the mechanism of resistance of bacteria to antibiotics.

B5 Explain the pathogenic mechanisms of different pathogenic bacteria.

B6 Interpret the results of serological tests.

B7 Advice for further tests necessary for full identification of pathogens

B8 Adhere to and comply with laboratory health and safety practice. Formulate a policy on the use of sterilization and disinfection in the laboratory. Explain the biodynamics of disinfection.

B9 Explain the clinical features, etiology, and pathogenesis of a viral disease.

B10 Interpret CPE in tissue cultures. Interpret the results of plaque assay.

B11 Interpret the results of immunofluorescence test. Recognize the apoptosis.

B12 Explain the clinical features, etiology, pathogenesis and laboratory diagnosis of mycotic diseases. Interpret the results of culture on fungal isolation media. Advice for further tests necessary for full identification of an isolated fungus.

B13 Recommend infection control (IC) policies and procedures

B14 Assess degrees of urgency for the diagnosis of TB, and plan the laboratory investigations for the diagnosis of TB

B15 Assess advanced technology in autoclaves

B16 Recognize the mechanisms and role of NK cells in cancer and its therapy.Interpret the cancer immunoediting mechanisms.

B17 Recognize the mechanism of mucosal immunity and its vaccines. Explain Vaccine Efficacy and Safety. Advice for further methods to help in vaccine preparation.

B18 Advice for further tests necessary for full identification of new viruses. Explain the underline genetics mechanisms responsible for response to interferone. Plan for new antiviral agent development.

B19 Identify stages of vaccine development and assess new technology in vaccine development. Assess the role of new vaccines in prevention of emerging diseases. Formulate a policy for immunization practice.

B20 Staining by acid fast alcohol fast stain. Microscopic examination of smears

B21 Assess the role of bacteria in oncogenesis

B22 Achieve a specific or differential diagnosis in rheumatoid arthritis and its therapy.

B23 Traditional culture methods versus recent culture techniques in diagnosis of *mycobacteria*.

C- Professional/practical skills:

C1 Competently perform PCR technique and gel electrophoresis.

C2 Competently perform plasmid extraction.

C3 Prepare and examine direct smears from clinical specimens and Identify Gram positive and negative bacteria by light microscope.

C4 Competently perform bacteriological cultures and the available biochemical reaction.

C5 Properly sterilize the simple equipments used in the laboratory and Practice laboratory techniques aseptically.

C6 Collect specimens for Microbiological investigations such as blood, urine, throat swab, rectal swab, stool, pus

C7 Competently perform Techniques of anaerobiosis e.g Gaspack system

C8 Quantitative analysis of urine by pour plate method and semiquantitative analysis by standard loop test for significant bacteriuria

C9 Perform antimicrobial susceptibility testing by Kirby-Bauer disk diffusion method or by estimation of Minimum inhibitory /Bactericidal concentrations by tube/plate dilution methods

C10 Competently perform serological tests e.g. Widal, Brucella agglutination

C11 Competently perform immunofluorescence.

C12 Competently perform different DNA fingerprinting techniques and carry out bacterial transformation methods.

C13 Develop skills in bacterial mapping techniques

C14 Collection of specimens for mycological diagnosis, direct examination of specimens by KOH, Gram, Kinyoun's, Giemsa, Lactophenol cotton blue stains. Examination of histopathology slides for fungal infections.

C15 Prepare of clinical specimens for isolation of viruses, primary cell lines and preserve cell cultures. Perform plaque assay and Perform immunofluorescence for identification of viruses

C16 Test the efficiency of disinfectants by 'in use' tests.

C17 Prepare glassware for tissue culture (washing, sterilization)

C18 Identify National Immunization Recommendation Systems, Interpret vaccine implementation options. Test Vaccine Efficacy and Safety

C19 Test antituberculus treatment Efficacy and Safety.Test vaccines Efficacy and Safety against Mycobacteria.

D- Communication & Transferable skills:

D1 Effectively utilize the library to access and search for information. Search midline database and Participate in research activities.

D2 Develop effective teaching skills by teaching junior colleagues and students as well as through conference presentations. Work in a team in the laboratory.

D3 Provide education to physicians and other hospital staff about infectious diseases in seminars lectures and ward rounds. Utilize problem-solving skills in practical situations.

D4 Report the facts using printable sheets in the field of microbiology

D5 Supervise collection, safe handling and processing of all routine specimens received in the laboratory. Develop a sense of the continuity of identification of specimens from collection, through culture and further testing to the issuing of a final report

D6 Conduct infection control educational and training programs for healthcare workers and non-medical care givers

D7 Recommend level of work restriction for health care workers with communicable diseases. Advise on appropriate patient placement

D8 Collaborate with appropriate persons to establish the existence of an outbreak

D9 Use different media for teaching that are appropriate to the teaching setting

D10 Communicate effectively with learners and with other members of the multidisciplinary team. Show leadership and safe supervision.

D11 Audit the infection control practice in hospitals through evaluating the structure, processes and outcomes against the standards according to evidence based IC guidelines. Participate in multidisciplinary quality/performance improvement strategies.

D12 Follow the ethical regulations of sample collection and delivery of results, showing respect to the patient's privacy.

D13 Supervise safe handling and processing of steps of vaccine preparation against Mycobacteria

D14 Follow the ethical regulations regarding vaccine Manufacturing, showing respect to the patient's privacy.

D15 Supervise safe handling and processing of all steps of vaccine preparation.

(3) Academic standards:

Academic standards for the programme are attached in Appendix I. in which External reference points/Benchmarks are used

A table of comparison between ARS, NARS, Program ILOs is attached in Appendix II.

3.a- External reference points/benchmarks are selected to confirm the appropriateness of the objectives, ILOs and structure of assessment of the programme

(4) Curriculum structure and contents:

4.a- Duration of the programme (in years or months): 6 semesters.

4.b- programme structure:

- 4.b.1: Number of credit hours (minimum): 60 credit hours
- 4.b.2: Teaching hours/week:

First part: 5hrs, **Second part:** 25hrs, **Thesis:** 15hrs, **Logbook:** 15hrs.

(5) Programme courses:

First part:

a- Compulsory course:

Course Title المقررات	Course Code	Theoretical	Total hours / Week	Total teaching hours
Molecular Biology	MIC607MB	5	5	75

Second part

a- Compulsory courses:

Course Title	Course	Theoretical	Practical	Field	Total hours / Week	Total teaching hours
Medical Microbiolog Immunology	MIC607	23	14 hours	1 hour	23	345

b- Optional courses:

Course Title	Course Code	Theoretical	Total hours / Week	Total teaching hours
Advanced Medical Bacteriology	MIC607AB	2	2	30
Advanced Medical Immunology	MIC607AI	2	2	30
Advanced Microbial Genetics	MIC607AG	2	2	30
Advanced Medical Mycology	MIC607AM	2	2	30
Advanced Medical Virology	MIC607AV	2	2	30
Advanced Hospital Infections	MIC607AHI	2	2	30
Vaccine development	MIC607VD	2	2	30
Advances in Mycobacteriology	MIC607MY	2	2	30

Course Title/Code	Programme ILOs (Knowledge)																							
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24
Molecular Biology	■	■	■	■	■																			
Medical Microbiology & Immunology						■	■	■	■	■	■	■	■	■										
Advanced Medical Bacteriology															■	■								
Advanced Medical Immunology																	■	■						
Advanced Microbial Genetics																			■					
Advanced Medical Mycology																				■				
Advanced Medical Virology																					■			
Advanced Hospital Infections																						■		
Vaccine development																							■	
Advances in Mycobacteriology																								■

Objectives	Programme ILOs (Knowledge)																							
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22	A23	A24
Objective 1				■	■	■	■	■	■	■		■	■	■	■					■	■			
Objective 2	■	■	■										■	■	■		■			■	■			■
Objective 3							■															■		
Objective 4	■	■	■						■								■	■	■		■			
Objective 5										■	■													
Objective 6																■							■	■

Course Title/Code	Programme ILOs (Intellectual skills)																						
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B21	B22	B23
Molecular Biology	■	■																					
Medical Microbiology & Immunology						■	■																
Advanced Medical Bacteriology				■	■																■		
Advanced Medical Immunology											■					■						■	
Advanced Microbial Genetics		■																					
Advanced Medical Mycology												■											
Advanced Medical Virology									■	■								■					
Advanced Hospital Infections			■					■					■		■								
Vaccine development																	■		■				
Advances in Mycobacteriology														■						■			■

Objectives	Programme ILOs (Intellectual skills)																						
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	B21	B22	B23
Objective 1			■	■	■		■					■	■	■				■					
Objective 2			■	■	■	■	■		■	■	■	■		■		■	■		■		■	■	■
Objective 3			■	■				■					■		■								
Objective 4	■	■				■					■					■	■		■			■	■
Objective 5						■					■					■	■		■			■	■
Objective 6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Course Title/Code	Programme ILOs (Professional/practical skills)																		
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19
Molecular Biology																			
Medical Microbiology & Immunology	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Advanced Medical Bacteriology																			
Advanced Medical Immunology																			
Advanced Microbial Genetics																			
Advanced Medical Mycology																			
Advanced Medical Virology																			
Advanced Hospital Infections																			
Vaccine development																			
Advances in Mycobacteriology																			

Objectives	Programme ILOs (Professional/practical skills)																		
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19
Objective 1			■	■	■	■								■	■		■		■
Objective 2			■	■	■	■	■	■	■	■	■			■	■				■
Objective 3			■			■		■	■							■	■		
Objective 4	■	■								■	■	■	■					■	
Objective 5										■	■	■	■					■	
Objective 6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Course Title/Code	Programme ILOs (Communication & Transferable skills)														
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15
Molecular Biology															
Medical Microbiology & Immunology	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Advanced Medical Bacteriology															
Advanced Medical Immunology															
Advanced Microbial Genetics															
Advanced Medical Mycology															
Advanced Medical Virology															
Advanced Hospital Infections															
Vaccine development															
Advances in Mycobacteriology															

(6) Programme admission requirements:

- General requirements:

  Accoding to the faculty postgraduate by laws.

- Specific requirements (if applicable):

  1- Fulfillment of at least 75 % of logbook activities.

  2- Attendance of lectures, clinical training, laboratory work and field training according to the MD programme specification.

(7) Regulations for progression and programme completion:

- Student must complete minimum of 60 credit hours in order to obtain the MD degree
- Log book fulfillment:
  1. Student must fulfill a minimum of 15 credit hours of log book activities including clinical training, laboratory work.
  2. Lectures and seminars of the previously decribed courses must be documented in the log book and signed by the lecturer.

Final exam:

1st part

الدرجة		الاختبار	المقرر
MCQs	تحريرى		
20	80	اختبار تحريرى مدته ثلاث ساعات	البيولوجيا الجزيئية فى الميكروبيولوجيا والمناعة الطبية

2nd part:

اجمالى	الدرجة				الاختبار	المقرر
	عملى	شفهى	MCQs	تحريرى		
400	100	100	40	80 + 80	اختباران تحريريان مدة كل منهما ثلاث ساعات + اختبار شفهى + اختبار عملى	الميكروبيولوجيا والمناعة الطبية
50			10	40	اختبار تحريرى مدته ساعة	المقرر الاختيارى

(8) Evaluation of Programme's intended learning outcomes (ILOs):

Evaluator	Tools*	Sample size
Internal evaluator (s)	Focus group discussion Meetings	
External Evaluator (s)	Reviewing according to External evaluator Checklist report.	
Senior student (s)		
Alumni		
Stakeholder (s)		
Others		

* TOOLS= QUESTIONNAIRE, INTERVIEW, WORKSHOP, COMMUNICATION, E_MAIL

We certify that all information required to deliver this programme is contained in the above specification and will be implemented. All course specification for this programme are in place.	
Programme coordinator: **Dr. Dalia Moamen** **Dr. Waleed Eldars**	Signature & date:
Head of department : **Prof. Mohammad Abou El-Ela**	Signature & date: