General Microbiology and Immunology; Code: PM 301

A- Basic Information

Programme(s) on which the course is given:	Bachelor of Pharmacy (Pharm D)
Department responsible for offering the course:	Department of Microbiology and Immunology
Department responsible for teaching the course:	Department of Microbiology and Immunology
Academic year:	Level two – fall semester (2023/2024)
Course title and code:	General Microbiology and Immunology, PM 301
Prerequisite:	Registration
Contact hours (credit hours):	Lecture: 2 (2), Practical: 2 (1), Total: 3 (2+1)
Course Coordinator:	Dr. Yomna Nagy

B- Professional Information

1 - Overall Aim of the Course

The course will provide students with a combination of laboratory and theoretical experience exploring the general aspects of microbiology. It includes the general characters of microorganisms, their morphology, diversity, cell/particle structure, growth, and cultural characteristics. It also clarifies different mechanisms of transport across bacterial cell membrane, metabolic pathways, and physiology of bacteria. The course also covers the principles of genetic characters including DNA and RNA structures, replication, different forms of mutation and mutagenic agents. Moreover it introduces the advanced concepts of medical immunology, with an emphasis on host parasite relationship, non-specific and specific immunity, mechanism of immune response, molecular and cellular immunology, including antigen, antibody structure and function, their interactions, effector mechanisms, complement, cell mediated immunity, active and passive immunization, aberration of immune system including hyperactivation and hypersensitivity, immuno-deficiency disorders, autoimmunity and auto-immune diseases, organ transplantation, cancer immunotherapy and serological reactions.

2 - Course Learning Outcomes:

Domain 1: Fundamental knowledge

The students should be able to:

Program key elements	Course learning outcomes
1.1.1.1. Reveal the knowledge of micro-organisms & infectious/ non-infectious diseases.	**1.1.1.1.** Demonstrate proper understanding of taxonomy, physiology and genetics of bacteria, viruses and fungi: **1.1.1.1.a.** Demonstrate proper understanding of bacterial morphology, biological requirements for bacterial growth, bacterial products, bacterial physiology and genetics. **1.1.1.1.b.** Demonstrate proper understanding of general characteristics of viruses, viral replication, classification as well as methods of cultivation of different viruses. **1.1.1.1.c.** Demonstrate proper understanding of

	morphology and general characteristics of different fungi, their nature, chemical composition of cell wall, fungal reproduction as well as classification of fungi..
1.1.1.4. Manifest understanding of pharmacological, toxicological, clinical, and physiological sciences.	**1.1.1.4.** Comprehend different types of immune responses and different mechanisms leading to the aberration of the immune system.
1.1.4.1. Explain the mechanism of drugs, antibiotics & toxins action.	**1.1.4.1.** Explain the mechanism of action of antimicrobial agents on different microorganisms.

Domain 2: Professional and ethical practice

The students should be able to:

Program key elements	Course learning outcomes
2.4.1. Make sure of safe handling of toxins to prevent their harmful impact on both individual and community levels.	**2.4.1.** Ensure safe handling/use of microbial suspensions to avoid their harm to individuals and communities.

Domain 3: Pharmaceutical care

The students should be able to:

Program key elements	Course learning outcomes
3.1.3. Recognize and control microbial growth & conduct lab tests needed for infectious diseases identification.	**3.1.3.** Monitor and control microbial growth and carry out different serological laboratory tests for identification of bacteria.

3- Course Contents

Week	Lectures	Credit hrs (2)	Practical	Credit hrs (1)
	Topics		Topics	
1	Overview and history of microbiology prokaryotes; classification of bacteria.	2	Gram staining technique part 1	1
2	Prokaryotes continued: bacterial morphology: structure of bacterial cells, biological requirements, growth, bacterial products, bacterial physiology, continuous culture.	2	Gram staining technique part 2	1
3	Study of microbial genetics and mutation through different mutagenic agents.	2	Gram mixtures	1
4	Study of mycology including general characteristics, classification.	2	Gram mixtures	1
5	Midterm Exam			
6	Study of virology including general characteristics, classification.	2	Acid fast staining technique	1

Week	Lectures Topics	Credit hrs (2)	Practical Topics	Credit hrs (1)
7	Basic immunology: immune system.	2	Spore staining technique+ Gram mixture	1
8	Innate and adaptive immunity, MHC, antigen-antibody reactions.	2	Capsular staining technique +Gram mixture	1
9	Hypersensitivity reactions	2	Preparation of heat killed vaccine+Serology	1
10	Aberration of immune system	2	**Practical exam**	1
11	Tumor immunology and transplantation, Study of different serological reactions: agglutination, precipitation, complement fixation, immunoflourescence, radioimmunoassay, ELISA.	2	**Practical Exam**	
12	Formative assessment	2		
	Total credit	22	9	
14	**Written exam**			

4- Teaching and Learning Methods:

. 4.1- Lectures (tools: board, projector, online classrooms).
4.2- Practical sessions (reagents, glassware, online tutorials)
4.3- Written essays (library, internet).
4.4- Team working

5- Student Assessment Methods:

Written Midterm exam	To assess	The ability of students to follow-up the course subjects.
Practical exam and assessment of semester work (class activities)	To assess	The ability of students to apply and practice scientific knowledge
Written final exam	To assess	The overall course learning outcomes.
Oral exam	To assess	The overall course learning outcomes.

Assessment Schedule

Assessment 1	Midterm exam	Week 5
Assessment 2	Practical exam	Week 10,11
Assessment 3	Oral exam	Week 14
Assessment 4	Final written exam	Week 14

Weighting of Assessments

Periodical examination	20
Final-term Examination	75
Oral Examination	15
Practical Examination	40
Other types of assessment	---
Total	**150**

6- List of References

Course notes

- Lecture notes of General Microbiology & Immunology prepared by instructors.

Essential books (textbooks)

- Brock Biology of Microorganisms, 14th Edition, 2014
- Kuby Immunology, 6th Edition

Periodicals, Web sites, etc

- Journal of bacteriology
- Journal of basic microbiology
- European Journal of immunology

7- Facilities Required for Teaching and Learning

Modern libraries, audiovisual tools, chemicals, cooperative assistants, glassware and instruments, lecture halls, data show, and internet.

Course members:

Prof. Dr. Nadia Abdelhaleem Hassouna
Prof. Dr. Mahmoud Abd El-Maguied Yassin
Dr. Yomna Nagy Elkholy
Dr. Ahmed Said Abuzaid

Course Coordinator: Dr. Yomna Nagy *Yomna Nagy*

Head of Department: Assoc. Prof.Dr. Sarrah Ebrahim Saleh *Sarra Saleh*

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Course Plan & Matrix

Week	Course Content	Program Key Elements	Course learning outcomes	Teaching and Learning Methods	Student Assessment Methods
1	Overview and history of microbiology prokaryotes; classification of bacteria. P: Gram staining technique part 1	**1.1.1.1**	**1.1.1.1**	Lectures Recorded tutorial Practical session	Periodic Written exam Oral exam Practical exam
2	Bacterial morphology: structure of bacterial cells, biological requirements, growth, bacterial products, bacterial physiology, continuous culture. P: Gram staining technique part 2	**1.1.1.1** **2.4.1** **3.1.3**	**1.1.1.1.a** **2.4.1** **3.1.3**	Lectures recorded tutorial Practical session	Periodic Written exam Oral exam Practical exam
3	Study of microbial genetics and mutation through different mutagenic agents. P: Gram mixture	**1.1.1.1** **2.4.1** **3.1.3**	**1.1.1.1.a** **2.4.1** **3.1.3**	lectures Practical session Open discussion	Periodic Written exam Oral exam Practical exam
4	Study of mycology including general characteristics, classification. P: Gram mixture	**1.1.1.1** **1.1.4.1** **2.4.1** **3.1.3**	**1.1.1.1.a** **1.1.4.1** **2.4.1** **3.1.3**	Lectures Practical session Recorded tutorial	Written exam Oral exam Practical exam
5	**Midterm Exam**				
6	Study of virology including general characteristics, classification. P: Acid fast staining technique	**1.1.1.1** **2.4.1** **3.1.3**	**1.1.1.1.a** **2.4.1** **3.1.3**	Lectures Practical session recorded tutorial	Written exam Oral exam Practical exam
7	Basic immunology: immune system P: Spore staining technique +Gram mixtures	**1.1.1.1** **1.1.4.1** **2.4.1** **3.1.3**	**1.1.1.1.b** **1.1.4.1** **2.4.1** **3.1.3**	Lectures Practical session Recorded tutorial	Written exam Oral exam Practical exam
8	Innate and adaptive immunity, MHC, antigen-antibody reactions. P: Capsular staining technique + Gram mixtures	**1.1.1.1** **1.1.4.1** **2.4.1** **3.1.3**	**1.1.1.1.c** **1.1.4.1** **2.4.1** **3.1.3**	Lectures Practical session Recorded tutorial	Written exam Oral exam Practical exam
9	Hypersensitivity reactions P: Preparation of vaccine and Serology	**1.1.1.4** **3.1.3**	**1.1.1.4** **3.1.3**	Lectures Practical session Recorded tutorial	Written exam Oral exam Practical exam
10	Aberration of immune system	**1.1.1.4**	**1.1.1.4**	Lectures	Written exam Oral exam
11	Tumor immunology and transplantation Study of different serological	**1.1.1.4** **3.1.3**	**1.1.1.4** **3.1.3**	Lectures	Written exam Oral exam

	reactions: agglutination, precipitation, complement fixation, immunoflourescence, radioimmunoassay, ELISA. .				
12	Formative assessment				

In case of emergency or necessity, the study will be converted into recorded and interactive lectures.

تم الاعتماد فى (محضر مجلس قسم الميكروبيولوجيا والمناعة)
جلسة رقم (11) بتاريخ 31/8/2023