Advanced Immunology; Code: PHM 702

A-Basic Information

Programme(s) on which the course is given:	Master's degree of pharmaceutical sciences (Microbiology and Immunology)
Department responsible for offering the course:	Department of Microbiology and Immunology
Department responsible for teaching the course:	Department of Microbiology and Immunology
Academic year:	Pre-Master Courses-2023/2024-second semester
Course title and code:	Advanced Immunology, PHM 702
Contact hours (credit hours):	Lecture: 3 (3), Total: 3 (3)
Course Coordinator:	Dr. Ahmed Said Abuzaid

B- Professional Information

1 - Overall Aims of Course

Upon successful completion of this course, the student should have a detailed background on immune system. They should know the mechanisms of immune responses, and the difference between innate and adaptive immunity. They should understand the role of complement system, antibodies, and lymphocytes in the immune response. They should know in details the antigens/immunogens, and MHC. They should understand the regulation of lymphocyte development and lymphocyte activation, mechanisms of cell-mediated killing of infected, and neoplastic cells, the different types of hypersensitivity. The students should in details the diseases of immune system including autoimmunity and immunodeficiency. They should understand the serological reactions and their role in diagnosis of different diseases. Understand the definition of immunobiologic agent along with the different types of vaccines and guidelines for different immunologic agents administration.

Intended Learning Outcomes of Course (ILOs)

A. Knowledge and Understanding:

The students should be able to:

a1. Recognize the role of cells and organs of the immune system that can protect the body against infectious diseases.

a2. Define antigens, antibodies, complements, major histocompatibility complex, antigen presenting cells.

a3. Describe the different mechanisms of immune responses, and understand the regulation of lymphocyte development and lymphocyte activation.

a4. Recognise the difference between immunodeficiency and autoimmune diseases, and understand the mechanisms of cell-mediated killing of infected and neoplastic cells.

a5. Understand the fundamentals of serology.

a6. Understand different Immunobiologic agents.

B. intellectual skills

b1. Predict the different mechanisms of immune response

b2. Estimate and differentiate between the different mechanisms of hypersensitivity reactions.

b3. Differentiate between immunodeficiency and autoimmune diseases

b4. Use the serological reaction for diagnosis of diseases.

b5. Understand guidelines for immunobiologic agents administration.

D. General and Transferable Skills

The students should:

d1. Effectively communicate with other colleague in the same field

d2. Use different available information resources

d3. Acquire, transform and interpret data

2 - Course Contents

Topics	No. of hours	Lectures
- An introduction of immune system, classification of immune system: **1.** Innate immune system (physicochemical barriers, cellular components, phagocytosis, soluble factors) **2.** Adaptive immune system (properties, phases)	6	2
- Cells and tissues of Immune System - Inflammation - Immunization (active and passive immunization)	6	2
- Antigens (properties, factors influencing the immunogenicity, properties of immunogenic agent, types of antigens, adjuvants**)** - Major Histocompatibility Complex (MHC)	6	2
- Antibodies (structure, types, monoclonal antibodies, Immunoglobulin class switching) - Complement system - Cytokines	6	2
- Immune system aberrations (autoimmune diseases, hypersensitivity reactions, immunodeficiency)	6	2
- Serological reactions	3	1
- Immunobiologic agents definition and types.	6	2

Topics	No. of hours	Lectures
- Types of vaccines and immunization schedules - Types of diseases in which immunologic agents are used - Guidelines for immunologic agents' administration - Reactions to vaccine components - Vaccination during Pregnancy - Misconceptions concerning contraindications to vaccines - Vaccination against COVID19		
Cancer immunotherapy Immune responses against tumors and transplant -Types of grafts and graft rejection	6	2
Total	45	15

3 - Teaching and Learning Methods

1 - Lectures
2 - Online teaching
3 - Discussion session.

5- Student Assessment Methods

- **Oral Exam** to assess skills of analysis, scientific thinking as well as scientific discussion
- **Final written exam** to assess the ability of student to remember and retrieve information as well we understanding of the scientific background.
- **Activities**

  - Presentation of main topics

Assessment Schedule

Assessment 1	Activities	Week 10
Assessment 2	Oral exam	Week 16
Assessment 3	Final written exam	Week 16

Weighting of Assessments

Activities	10%
Final-written exam	80%
Oral exam	10%
Total	**100%**

6-List of References

A. Recommended text books

- Review of Medical Microbiology and Immunology, 13 edition by Warren Levinson, MC Graw Hill Education, 2014.

- Cellular and Molecular Immunology, 8edition by Abul K. Abbas MBBS, Andrew H. H. Lichtman, 2015.

B. Websites

Nucleic acids research (SMART; **Letunic*et al.*, 2004;** http://nar.oupjournals.org/cgi/content/full/32/suppl_1/D142),

British society for immunology, https://immunology.org/

www.sciencedirect.com

www.springerlink.com

7- Facilities Required for Teaching and Learning

- Study halls
- Data show
- Internet
- Online teaching platforms

Course Coordinator: **Dr. Ahmed Said Abuzaid.**

Ahmed Abouzeid

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

Sarra Saleh

Course name	Advanced Immunology
Code	PHM 702

Course matrix

Course content	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	b5	d1	d2	d3
- An introduction of immune system., -Classification of immune system: **1.** Innate immune system **2.** Adaptive immune system														
- Cells and Tissues of Immune System - Inflammation - Immunization														
- Antigens - (MHC) - Antibodies - Complement system - Cytokines														
- Immune system aberrations **A.** Autoimmune diseases, **B.** Hypersensitivity reactions. **C**.Iimmunodeficiency)														
- Immune responses against tumors and transplant - Cancer immunotherapy - Types of grafts and graft rejection														
- Serological reactions														
- Immunobiologic agents														
Open Discussion														

تم الاعتماد فى محضر مجلس قسم الميكروبيولوجيا والمناعة
جلسة رقم (٦) بتاريخ ٢٠٢٤/٢/١٤