كلية الطب البشري
Faculty of Medicine

الجامعة الهاشمية
The Hashemite University

Course information:

Course title	Immunology
Course number	111501208
Credit hours	3
Course date	Summer Semester 2025/2026
Course location and dates	Medicine Faculty, Sunday, Monday, Tuesday and Wednesday 9:20-10:35, and 10:40-11:55
Calendar Description	8 working weeks for 2nd year Medical students
Coordinator	Dr. Hafez Al-momani Office 3041, 3rd Floor, Ibn Sina Medical Complex, Faculty of Medicine Office hours: Sunday and Teusday, 1-2 pm Phone: 053903333 ext. 5380 E-mail: Hafez@hu.edu.jo

Course description:

This discipline is concerned with the study of the immune system of the humans that has evolved to protect against infection by pathogens. The course will provide a basic understanding of the human immunology and its relationship to health and disease. Immunology overlaps with many other biological disciplines including Biochemistry, Molecular Biology, Cell Biology, Genetics, Physiology, and Microbiology , it relies on methods and concepts derived from these disciplines and in turn makes a major contribution to them. The course aims to provide students with an appreciation of these relationships while providing knowledge of the molecular and cellular basis of the immune system. The course will discuss as well the principals of immunological treatments including anti-inflammatory, anti-cancer, immunosuppressive, vaccines and antigen and antibody-based treatment.

Instructional methods:

Lectures-Power Point presentations
Departmental hand-outs, animations, educational movies, illustrations, Self-readings, discussions, case studies

Recommended Textbooks:

1. **Basic Immunology: Functions and Disorders of the Immune System 6th Edition**
2. Essentials of Clinical Immunology - Latest edition, Helen Chapel**,** Mansel Haeney**,** Siraj Misbah**,** Neil Snowden
3. Essential Clinical Immunology - Latest edition, John Zabriskie

Grading Policy:

Grades are based on the following:

Midterm Exam	50 Marks

Final Exam	50 Marks
Total	100 Marks

Classroom (TEAMS) Protocol:

Professionalism is a major component of academic performance. Students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. Students respond politely to faculty, staff, and student colleagues, exemplifying their maturity and empathy. Students agree to abide by appropriate bio-safety practices when required. All students are expected to have their microphones silenced during the lecture. Engagement in class discussions is encouraged by hand raising. Students should be prepared to answer questions any time during the lecture when prompted.

SPECIFIC (LEARNING) OBJECTIVES:

After studying the material covered in lectures & sessions of this course, using his/her private self-learning time in a productive way, the student is expected to achieve the following specific objectives:

SUBJECT
General Introduction to the Immune System **Objectives:** 1. Definition of Immunology 1. Importance of Immunology 2. Historical background of Immunology 3. Modern Immunology 4. Outline the major principles of the human immune response (innate immunity, humoral immunity, and adaptive immunity)
Organs and Cells of the Immune System **Objectives:** 1. The organs and tissues of the immune system 2. Hematopoiesis and formation of blood cells 3. Immune cells classes, functions and circulation 4. Immune cells development and maturation

Antigen and antigen based treatment
Objective:

1. Definition of antigens and epitopes
2. Types and sources of antigens
3. Antigen processing and presentation
4. The roles of Major Histocompatibility Complex (MHC)
5. Discuss the role of antigen presentation in generating immunity
6. Antigen based treatment: types, mechanism of action, indications, and side effect

Antibodies and antibodies based treatment
Objectives:

1. Immunoglobulin structure and binding site/s
2. Immunoglobulin classes and their characteristics
3. the role of Immunoglobulin's in neutralization, opsonization, antibodydependent cellular cytotoxicity (ADCC), complement and mucosal immunity
4. Introduction to artificial antibodies including monoclonal and polyclonal antibodies
5. **Using antibodies in treatment**

Principles of Innate Immunity
Objectives:

1. Discuss the concept of innate immunity - features, importance.
2. Explain how the innate immune system recognizes foreign antigens in general.
3. Outline the components of the innate immune system.
4. Discuss how these components combat various foreign antigens.

Inflammation, Leukocyte Activation and Migration
Objectives:

1. Overview of the inflammatory process: initiation, inflammation, resolution
2. Benefits and liabilities
3. Major constituents
4. Clinically relevant inflammatory processes
5. Control of inflammation
1. Understand the main steps of leukocytes migration and circulation
2. Understand the main adhesion molecules involved in leukocytes adhesions
6. Understand the roles of chemokines in leukocytes activation
7. Non-steroidal anti-inflammatory drugs

Principles of Adaptive Immunity (Cellular and Humoral Immunity)
Objectives:

1. Explain the principles of adaptive immunity
2. Introduce the immune cells that mediate adaptive immunity and their specific roles in immune response to varying pathogens/antigens
3. Discuss the differences between cell-mediate immunity and humoral immunity
4. Explain what interactions are required for activation of T cells and B cells
5. Discuss the stages of cellular and humoral immunity
6. Discuss immunological memory and outline the differences between primary and secondary (memory) responses
7. Compare and contrast the innate and adaptive immune response

Autoimmunity and Tolerance
Objectives:

1. Define and discuss the general characteristics of tolerance
2. Define the main factors that influence the development of tolerance
3. Identify the main mechanisms of tolerance induction in B and T cells
4. Identify the mechanisms involved in the development of autoimmunity
5. Approach to treatment of autoimmune diseases

Tumor Immunology and anti-neoplastic drugs
Objectives:

1. Introduction to tumors types and etiology
2. Tumors associated antigens and markers
3. Evidence for Immune Reactivity to Tumors
4. Discuss immune protection against tumors and immune surveillance sys
5. Discuss immune mediated tumor growth
6. Provide an overview of experimental cancer therapies

Hypersensitivity and anti-allergic treatment
Objectives:

1. What is the difference between hypersensitivity and protective immunity?
2. Overview of the four major classifications of human hypersensitivity.
3. a) Type I hypersensitivity – Mechanisms (allergens, Th2 immunity, IgE, immediate and late phase reactions) and clinical overview
   b) Type 2, 3,4 hypersensitivities – Mechanisms and clinical consequences
4. Currently practiced vs. novel (experimental) approaches to clinical management of hypersensitivity.

Vaccines: Principles and Practice
Objectives:

1. Differentiates active and passive immunity
2. To understand the types of currently used vaccines, the differences, and the mechanisms of protection
3. Vaccination scheme, routes of administration, and common side effects
4. To understand how to develop a vaccine and the general requirements for vaccine development and adjvuants
5. To understand the new concept of vaccines against non-microbes such as self or tumor molecules

Transplantation Immunology and immunosuppressive treatment
Objectives:

1. Understand the main principles and applications of transplantation immunology
2. Understand the different mechanisms of transplant rejection and its clinical manifestations
3. Discuss laboratory investigations applied to transplantation
4. Understand the role of immune suppressive drugs in transplantation