

Course title: Theoretical Immunology

Credit (Theory): 2.5

Prerequisite: Microbiology

Department of Immunology, School of Dentistry- International Campus

2nd Semester of 2024-2025 (1403-1404)

Schedule Time: Tuesdays 10-12, 13-15

Instructors: Dr. Assarehzadegan, Dr. Delbandi, Dr. Falak, Dr. Jazayeri, Dr. Khoshmirsafa, Dr. Mojtabavi, Dr. Safari,

Course coordinator: Dr. Khoshmirsafa

Student responsibilities: Active participation in class, doing practice, multi-choice exam

Course Description: Introduces the principles of immunology including: development of the immune system, innate immunity, immunoglobulin structure and genetics, antigen-antibody reactions, the major histocompatibility complex reactions and antigen presentation, T cell receptors (genetics, structure, selection), T cell activation and effector functions, anergy and apoptosis, cytokines, phagocytic cell function, immune responses to infectious organisms and tumors, autoimmune diseases, autoimmunity, allergies, and immune deficiencies.

- Course objectives: The course aims to provide students with the basic knowledge about the functioning of the immune system, inflammation, immune response against infectious agents and against cancer, the causes and pathogenesis of major alterations in the immune response, vaccines, and immunotherapy.

Student Learning Objectives:

Know and understanding about:

1. Innate and Adaptive immunity
2. Cells and Tissues of the Immune System
3. Antigens & Antibodies
4. Antigen-Antibody reactions and their application in the diagnosis of diseases
5. Innate Immunity
6. Major Histocompatibility Complex molecules and Antigen Presentation to T cells
7. B cell Biology & Development
8. B cell activation & function
9. T cell Biology & Development
10. T cell activation & function
11. Immunity at Epithelial Barriers and in Immune Privileged Tissues
12. The Complement System
13. Immunologic Tolerance
14. Autoimmunity

15. Immunity to Microbes
16. Vaccine
17. Allergy
18. Hypersensitivity Disorders
19. Immunity to Tumors
20. Transplantation Immunology
21. Congenital Immunodeficiency
22. Acquired Immunodeficiency

Students are expected to:

Active Participation in Class, Doing practice

Course Plan

	Date		Title	Teacher
Part 1: Basic Immunology				
1	18-Feb-2025	10-12	Introduction to the Immune System: Innate and Adaptive immunity	Dr. Falak
2	1403/11/30	13-15	Cells and Tissues of the Immune System	Dr. Mojtabavi
3	25-Feb-2025	10-12	Antigens & Antibodies	Dr. Falak
4	1403/12/07	13-15	Antigen-Antibody reactions and their application in the diagnosis of diseases	Dr. Khoshmirsafa
5	04-Mar-2025	10-12	Innate Immunity	Dr. Delbandi
6	1403/12/14	13-15	Major Histocompatibility Complex molecules and Antigen Presentation to T cells	Dr. Khoshmirsafa
7	11-Mar-2025	10-12	B cell Biology & function	Dr. Delbandi
8	1403/12/21	13-15	T cell Biology & Function	Dr. Safari
9	08-Apr-2025 1404/01/19	10-12	The Complement System	Dr. Assarehzadegan
Midterm				
10	08-Apr-2025 1404/01/19	13-15	Immunity at Epithelial Barriers and in Immune Privileged Tissues	Dr. Jazayeri
11	15-Apr-2025 1404/01/26	10-12	Immunologic Tolerance & Autoimmunity	Dr. Mojtabavi

Part 2: Clinical Immunology

12	15-Apr-2025 1404/01/26	13-15	Immunity to Microbes	Dr. Falak
13	22-Apr-2025	10-12	Oral & Gingiva Immune System	Dr. Mojtabavi
14	1404/02/2	13-15	Hypersensitivity Type I and Allergy	Dr. Assarehzadegan
15	29-Apr-2025	10-12	Hypersensitivity Disorders (II,III, IV)	Dr. Assarehzadegan
16	1404/02/09	13-15	Immunity to Tumors	Dr. Safari
17	06-May-2025	10-12	Vaccine	Dr. Jazayeri
18	1404/02/16	13-15	Immunoematology	Dr. Safari
19	13-May-2025	10-12	Transplantation Immunology	Dr. Jazayeri
20	1404/02/23	13-15	Congenital Immunodeficiency	Dr. Khoshmirsafa
21	20-May-2025 1404/02/30	10-12	Acquired Immunodeficiency	Dr. Khoshmirsafa
			Final Exam	

References:

1. **Basic Immunology: Functions and Disorders of the Immune System, 6th e. 2019** by Abul K. Abbas and Andrew H. H. Lichtman
2. **Cellular and Molecular Immunology, 10th e. 2021** by Abul K. Abbas and Andrew H. H. Lichtman

Course title: Practical Immunology

Credit (Practical): 1

Prerequisite: Microbiology

Department of Immunology, School of Dentistry- International Campus

First Semester of 2024 (1403)

Schedule Time: Tuesdays **10-15**

Instructors: Doctors: Assarehzadegan, Delbandi, Falak, Jazayeri, Khoshmirsafa, Mojtabavi, Safari

Course coordinator: Dr. Khoshmirsafa

Student responsibilities: Active participation in class and laboratory, doing practice and tests, multi-choice exam

Course Description: Application of basic principles acquired from immunological procedures performed in research and diagnostic laboratories using molecular and cellular approaches; instruction through lectures, video tapes, and practical exercises in the laboratory.

- Course objectives: The objective is to familiarize students with the various immunological techniques that include antigen-antibody interactions, quantitation of antigens or antibody, ELISA, agglutination reactions etc.

Student Learning Objectives:

Know and understanding about:

1. Agglutination reactions (application and interpretation of the test)
2. Hemagglutination reactions (application and interpretation of the test)
3. Precipitation reaction (application and interpretation of the test)
4. Labeled immunoassay (ELISA and chemiluminescence)
5. Immunofluorescence and flow cytometry
6. Skin prick test (SPT) and PPD test
7. Separation of peripheral blood mononuclear cells (PBMCs) and HLA Typing
8. Cell culture

Students are expected to:

Active participation in class and laboratory, doing practice and tests

Course Plan

Sessi on	Date		Title	Instructors
1	20-May-2025 1404/02/30	13-15	Agglutination reactions (application and interpretation of the test)	Dr. Falak/ Dr. Najafi
2	27-May-2025 1404/03/06	10-12	Hemagglutination reactions (application and interpretation of the test)	Dr. Khoshmirsafa/Dr. Mojtabavi/ Mrs.Baghenejad
3	27-May-2025 1404/03/06	13-15	Precipitation reaction (application and interpretation of the test)	Dr. Delbandi/ Mr. Abdian
4	27-May-2025 1404/03/06	13-15	Skin prick test (SPT) and PPD test	Dr. Assarehzadegan/ Mr.Abdian
5	27-May-2025 1404/03/13	10-12	Immunofluorescence and flow cytometry	Dr. Jazayeri/ Mrs Malekpour
6	03-Jun-2025 1404/03/13	10-12	Labeled immunoassay (ELISA and chemiluminescence)	Dr. Safari/ Mrs.Malekpour
Exam				

References:

Clinical Immunology and Serology: A Laboratory Perspective. 5th e. 2021. By Christine Dorresteyn Stevens; Linda E Miller