

In the Name of God



**Hamadan University of Medical Sciences and Health Services
Educational Deputy of the University**

Center for Studies and Development of Medical Sciences Education

Fundamentals of Medical Immunology

Dear Colleagues,

As the teaching-learning process is one that cannot achieve its objectives without planning, it is essential to develop a lesson plan at the beginning of the educational process (as a roadmap and guide for instructors and students). Therefore, it is requested that esteemed instructors exercise utmost care in completing the lesson plan.

Course and Instructor Information

- **Course Title:** Fundamentals of Medical Immunology
- **Instructor(s):** Dr. Mohammad Mehdi Eftekhariyan, Dr. Mehrdad Hajilouei, Dr. Mohsen Rastegari Pouyani
- **Course Coordinator:** Dr. Mohammad Mehdi Eftekhariyan
- **Head of Department:** Dr. Mehdi Behzad
- **Credits and Type:** 3 Credits – Theoretical
- **Student Major and Level:** Medical Immunology – Master’s Degree
- **Semester:** First Semester
- **Teaching Location:** Lecture Hall – Classroom 4, Faculty of Medicine

Fundamentals of Medical Immunology – Session Plan

Session	Topic	Behavioral Objectives	Instructor	Learning Domain	Teaching Method	Duration	Teaching Aids	Evaluation Method
1	History and Introduction to Innate and Adaptive Immunity	1. Present a general history of Immunology; 2. Explain innate and adaptive immunity and their differences; 3. Explain cellular and humoral immunity; 4. List types of white blood cells and describe their functions	Dr. Eftekhariyan	1. Cognitive (Knowledge); 2-4. Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
2	Innate Immune Cells and Inflammation	1. Name components of innate immunity and explain each; 2.	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A

		Explain inflammation and its stages						
3	Immune System Tissues	1. Differentiate primary and secondary lymphoid tissues; 2. Explain lymphocyte circulation; 3. Explain lymphocyte homing; 4. Describe leukocyte extravasation stages	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
4	Adhesion Molecules and Leukocyte Trafficking	1. Explain adhesion molecules and their role; 2. Describe lymph node structure and leukocyte circulation; 3. Describe spleen structure; 4. Describe Peyer's patches	—	1-3. Cognitive (Understanding); 4. Cognitive (Knowledge)	Lecture / Discussion	2h (T)	Video projector	Q&A
5	Antigen	1. Define antigen; 2. Define epitope and describe structural aspects; 3. Classify epitopes by shape and presence; 4. List and explain factors affecting immunogenicity; 5. Classify types of antigens	—	1. Cognitive (Knowledge); 2-5. Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
6	Antibody	1. Describe general antibody structure; 2. Explain constant and	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A

		variable regions; 3. Identify antibody classes/subclasses; 4. Detail antibody structure; 5. Describe biological properties; 6. Explain immunoglobulin antigenic determinants; 7. List and describe factors affecting antigen–antibody interaction						
7	Antigen Presentation and MHC	1. Explain MHC antigen presentation system; 2. Identify MHC classes and structures; 3. Explain MHC roles in antigen presentation; 4. Classify transplant types and rejection; 5. Explain MHC in rejection, autoimmunity, and forensics	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
8	Complement System	1. Describe components of the complement system; 2. Explain activation pathways; 3. Explain	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A

		complement biological effects						
9	Regulation of Complement System	1. Explain regulation methods of the complement system; 2. Describe deficiencies in complement components and related diseases	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
10	Phagocytosis	1. Define phagocytosis; 2. Describe phagocytic cell types; 3. Explain steps of phagocytosis; 4. Explain killing mechanisms of phagocytes	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
11	Inflammation in Detail	1. Describe stages and mediators of inflammation; 2. Explain acute vs. chronic inflammation	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
12	B Lymphocytes	1. Describe development and maturation of B lymphocytes; 2. Describe BCR structure and function; 3. Explain activation and differentiation	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
13	T Lymphocytes	1. Describe development and	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A

		maturation of T lymphocytes; 2. Describe TCR structure and function; 3. Explain activation and differentiation						
14	Cytokines	1. Define cytokines; 2. Classify cytokines; 3. Explain their role in immune responses	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
15	Immunological Tolerance	1. Define tolerance; 2. Explain mechanisms of central tolerance; 3. Explain mechanisms of peripheral tolerance	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
16	Hypersensitivity Reactions – Part 1	1. Define hypersensitivity; 2. Classify hypersensitivity reactions; 3. Explain Type I mechanisms	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
17	Hypersensitivity Reactions – Part 2	1. Explain Type II, III, and IV mechanisms; 2. Provide examples of each	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
18	Autoimmunity	1. Define autoimmunity; 2. Explain mechanisms; 3. Describe examples of autoimmune diseases	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A

19	Primary Immunodeficiencies	1. Classify primary immunodeficiencies; 2. Describe examples and causes	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
20	Secondary Immunodeficiencies	1. Define secondary immunodeficiencies; 2. Describe causes; 3. Provide examples	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
21	Tumor Immunology	1. Describe immune system interaction with tumors; 2. Explain immune surveillance and evasion	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
22	Immunology of Transplantation	1. Explain transplant immunology concepts; 2. Describe mechanisms of rejection; 3. Present immunosuppressive therapies	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
23	Immunology of Infectious Diseases	1. Describe immune responses to bacteria, viruses, fungi, and parasites	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
24	Immunization	1. Explain principles of vaccination; 2. Classify vaccine types; 3. Present common vaccination programs	—	Cognitive (Understanding)	Lecture / Discussion	2h (T)	Video projector	Q&A
25	Laboratory Techniques in Immunology	1. Describe main immunological laboratory methods; 2.	—	Cognitive (Understanding)	Lecture / Discussion			

		Explain their applications						
--	--	----------------------------	--	--	--	--	--	--

Grading Scheme

Evaluation Type	Date	Evaluation Tool	Points
Quiz			
Project Presentation			
Midterm Exam			
Final Exam		Essay Test (Dr. Eftekhariyan – 9 points; Dr. Hajilouei – 6 points; Dr. Rastegari – 5 points)	20
Other			
Total			20

References

1. Abul Abbas, *Cellular and Molecular Immunology*, Latest edition.
2. Charles Janeway, *Immunobiology*, Latest edition.
- .3 Related review articles from reputable journals