



Immunology

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
BIO	212	Immunology	3	2	2	0	BIO113

Objectives:

The objective of this course is to facilitate an understanding of preliminary knowledge of the immune system in humans and other mammals. On successfully completing this course, students will be expected:

- To familiarize with basic concepts in immunology.
- To introduce the most important theories in immunology.
- To introduce the different types of failures of the immune system.
- To present the difference between innate and adaptive immune responses.
- To introduce the basic concepts in t cell education, survival, and maturation.
- To familiarize the students with the different types of immunoglobulins and their functions.

Syllabus:

- Introduction, basic concepts in immunology, components of the immune system, principles of innate and adaptive immunity.
- Innate immunity, different lines and layers of defense, pattern recognition in innate immune system, the complement system, induced innate responses to infections.
- Antigen recognition by B-cells, the structure of a typical antibody molecule, interaction between the antibody and specific antigen, diversity of immunoglobulins: VDJ recombination.
- Antigen recognition by t cells, antigen processing and presentation: MHC.
- Development and survival of lymphocytes, lymphocytes in bone marrow and thymus, positive and negative selection of lymphocytes, survival and maturation of lymphocytes.
- The adaptive immune response, T cell-mediated immunity and cytotoxicity, macrophage activation by armed CD4 TH1 cells, humoral immune response.
- Adaptive immunity to infection, infectious agents and how they cause disease, the course of the adaptive response to infection, the mucosal immune system, immunological memory
- Failures of host defense mechanisms, how do pathogens evade the immune system, inherited immunodeficiency diseases, acquired immune deficiency syndrome
- Allergy and hypersensitivity, effector mechanisms in allergic reactions and IGE, hypersensitivity diseases
- Autoimmunity and transplantation, autoimmune responses are directed against self-antigens, responses to alloantigen's and transplant rejection, self-tolerance and its loss
- Manipulation of the immune response, extrinsic regulation of unwanted immune responses, using the immune response to fight infections and attack tumors

References:

- Judy Owen; Jenni Punt; Sharon Stranford, Pat Jones, Kuby, Immunology 7th ed, (2013), ISBN-13: 978-1429219198.
- The Immune System (TIS), 3rd edition, Peter Parham (2005), ISBN 978-0-8153-4146-8.

