Principles of Immunology
Syllabus for Bio4013
(Tentative)

Course Goals & Objectives:
Immunology is a fundamental discipline concerning the one and only defense system that higher creatures possess. The goal of this course is to provide a comprehensive understanding of the contemporary immunology from innate to adaptive immunity to pathogen-host interactions during immunoresponses.

Objectives - To provide knowledge and methods for students to understand and analyze immune system, innate immunity, adaptive immunity, immune system development, defenses against tumors and infectious agents, and transplantation and the immune system.

> Describe structural basis of the innate immune system.

> Describe the functional interplay between innate and adaptive immunity.

> Describe antigen presentation to lymphocytes.

> Describe cellular immune responses.

> Describe humoral immunity.

> Describe immunological tolerance and autoimmunity.

> Describe tumors and transplantation in the context of immunity.

> Describe immune system diseases.

Section I The Immune System (Ch. 1)
i. Termination ii. Basic properties
   iii. Different components

Section II Innate Immunity (Ch. 2)
i. Immediate defense against infection
ii. Evolution

Section III Antigen Presentation to Lymphocytes (Ch. 3) i. Antigen processing ii. MHC/peptide interaction
iii. Intracellular trafficking
iv. Antigen presentation to T cells
v. Antigen presenting cell types

Section IV  Adaptive Immune System (Ch. 4)
i. Structure of antigen receptors
   ii. Immunological repertoires

Section V  Cellular Immune Responses (Ch. 5 & 6)
i. Activation of T cells
   ii. Antigens by cell-associated microbes
   iii. Eradication of intracellular microbes

Section VI  Humoral Immunity (Ch. 7 & 8)
i. B cell activation
   ii. Responses of B cells
      iii. B cells and antibodies
      iv. Elimination of extracellular microbes and toxins

Section VII  Immunological Tolerance and Autoimmunity (Ch. 9)
i. Self-nonself discrimination
   ii. Consequences of failure

Section VIII Immune Responses against Tumors and Transplants (Ch. 11)
i. Immunity to transformed cells
   ii. Rejection of transplants

Section IX  Immune System Diseases (Ch. 10 & 12)
   i. Disorders of immune responses - hypersensitivity
   ii. Diseases due to defective immunity - e.g. Covid19

The textbook for this course:

Recommended Reference:
Janeway's Immunobiology, Kenneth Murphy, 8th Edition (2011) Garland Science