Administrative Unit: Science Department

Course Prefix and Number: BIOL 415

Course Title: Principles of Immunology

Number of Credit Hours: 3 Lecture Hours: 3 Laboratory Hours: 0

Catalog Description: Theoretical foundations of immunology, including antibody and cell-mediated immune response; antibody-antigen interactions; and immune system disorders. Designed to prepare pre-professional students for later studies.

Prerequisites: BIOL 110, BIOL 312. Offered odd spring.

Prerequisite(s)/Corequisite(s): BIOL 110, BIOL 312.

Text(s): Recommended types of textbooks; textbooks listed are not necessarily the books used in the course:

Most current editions of the following:

Abbas & Lichtman. Basic Immunology. Saunders Publishing.


Course Objectives:

• To discuss cells and tissues important in the immune system.
• To describe the roles of the immune system and mechanisms of immune responses.
• To illustrate how malfunctions of the immune systems lead to various disorders.
• To relate course content to current developments in research.

Measurable Learning Outcomes:

• Explain the specialized functions of cells and tissues involved in the immune system.
• Describe the role of antigens in stimulating immune response.
• Detail the mechanisms of antibody synthesis and relate this process to antibody/antigen interaction.
• Differentiate between cellular and humoral immune response.
• Distinguish between T-cells and B-cells and describe their maturation, differentiation and
• Illustrate the relationship between malfunctions of the immune system and disorders such as autoimmunity, hypersensitivity, graft/host rejection and immunodeficiency.
• Describe modern molecular techniques used in immune research and determine which techniques are appropriate in a given experimental situation.
• Actively relate course content to current developments in stem cell research, vaccine development, autoimmune disorders and infectious diseases.

Topical Outline (major areas of coverage):

• Cells and tissues of the immune system
• Immunoglobulins, gene organization, expression and function
• Antibody/antigen interactions
• Major histocompatibility complex
• Cellular immunity
• B-cell and T-cell maturation, activation, differentiation and function
• Cytokines and the complement system
• Infectious disease and immune response
• Vaccines
• Disorders of the immune system, autoimmune disorders, immunodeficiency, transplantation, cancers.

Recommended maximum class size for this course: 35

Library Resources: Online databases are available at http://www.ccis.edu/offices/library/resources.asp. You may access them from off-campus using your eServices login and password when prompted.

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Date: March 20, 2006

NOTE: The intention of the master syllabus is to provide an outline of the contents of this course, as specified by the faculty of Columbia College, regardless of who teaches the course, when it is taught or where it is taught. Faculty members teaching this course for Columbia College are expected to facilitate learning pursuant to the course objectives and cover the subjects listed in the topical outline. However, instructors are also encouraged to cover additional topics of interest so long as those topics are relevant to the course’s subject. The master syllabus is, therefore, prescriptive in nature but also allows for a diversity of individual approaches to course material.

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