Philadelphia University
Faculty of Science
Department of Biotechnology and Genetic Engineering
Second Semester, 2007/2008

Course Syllabus	
Course Title: Immunology	**Course code:** 240320
Course Level: Undergraduate	**Course prerequisite (s) and/or corequisite (s):**
Lecture Time: Section 1: 9-10 AM, Sun, Tue, Thu Section 2: 9:45-11:15, Mon, Wed	**Credit hours:** 3

Academic Staff Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Adeeb Al-Zoubi, Ph.D.	Assistant Professor	Science S-904	Sun: 10-11 Tues: 10-11 Wed: 11-12	Alzoubiadeeb@yahoo.com

Course Module Description

This is an introductory course of immunology. It is intended for students in the Biotechnology and Genetic Engineering field. The course consists of interactive lectures that incorporate Power Point presentations that help the instructor present the intended ideas clearly. Additionally, the instructor uses the help of pre-made CD animations that come with the book. These animations are utilized throughout the material to extend the explanation of specific ideas. Furthermore, the instructor uses some pre-evaluated educational movies and presentations made and prepared by professional institutions. The instructor incorporated a new technique in this class that is currently used in most immunology laboratories world-wide; it is the flow cytometry, in which the instructor was trained on for quite long time in the recent past. Students are introduced to basic concepts of flow cytometry and are acquainted with its major applications. The textbook, Immunobiology, 6^{th} edition, is the most used text book in immunology at academic institutions in the US and Canada, both for undergraduate and graduate immunology courses. The instructor aims at preparing his students for graduate studies if they intend to do so. The book presents immunological concepts in an interesting and imaginative way that makes learning immunology both easy and exciting.

Course Module Objectives	Weights
1. Familiarize students with basic concepts in immunology	20%
2. Introduce students to the most important theories in immunology	25%
3. Introduce to the students the different types of failures of the immune system	15%
4. Present the difference between innate and adaptive immune responses	20%
5. Introduce the basic concepts in T cell education, survival, and maturation	10%
6. Familiarize the students with the different types of immunglobulins and their functions	10%

Course Module Components
1. Introduction, basic concepts in immunology, components of the immune system, principles of innate and adaptive immunity
2. **Innate immunity,** Different lines and layers of defense, Pattern recognition in innate immune system, The complement system, Induced innate responses to infections
3. **Antigen recognition by B-cells,** The structure of a typical antibody molecule, Interaction between the antibody and specific antigen, Diversity of Immunoglobulins: VDJ Recombination
4. **Antigen recognition by T cells,** Antigen processing and presentation: MHC,
5. **Development and survival of lymphocytes,** Lymphocytes in bone marrow and thymus, Positive and negative selection of lymphocytes, Survival and maturation of lymphocytes,
6. **The Adaptive Immune Response,** T Cell-Mediated Immunity and cytotoxicity, Macrophage activation by armed CD4 T_H1 cells, Humoral Immune Response
7. **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
8. **Failures of Host Defense Mechanisms,** How do pathogens evade the immune system, Inherited immunodeficiency diseases, Acquired immune deficiency syndrome
9. **Allergy and Hypersensitivity,** Effector mechanisms in allergic reactions and IgE, Hypersensitivity diseases
10. **Autoimmunity and Transplantation,** Autoimmune responses are directed against self antigens, Responses to alloantigens and transplant rejection, Self-tolerance and its loss
11. **Manipulation of the Immune Response,** Extrinsic regulation of unwanted immune responses, Using the immune response to fight infections and attack tumors

Textbook Information	
Title	Immunobiology, the immune system in health and disease,
Author(s)	Janeway, Travers, Walport, and Shlomchik
Publisher	Garland Science Publishing, 29 West 35th Street, New York, NY 10001, USA, **ISBN**: 0 8153 4101 6
Year	2005
Edition	6th Edition
Book Website	attp://www.ncbi.nlm.nih.gov/books/bv.fcgi?call=bv.View..Show TOC&rid=imm.TOC&depth=2

- **Support material (s):** Flow cytometry handouts, Immunology animations and movies, Slide handouts.
- **Study guide (s) (if applicable):** Specific handouts for each chapter.
- **Homework and laboratory guide (s):** Not applicable.

Teaching & Learning Methods
Power Point presentations, animations, educational movies, illustrations, group visits to flow cytometry facilities

Learning Outcomes: Upon successful completion of this course, students will be familiar with the concepts related to the following topics:	
Related Objective(s)	**Reference(s)/Chapters**
1. Basic concepts in immunology	1, 2
2. Components of the immune system	1, 2, 3
3. Principles of innate and adaptive immunity	2-5
4. Antigen recognition by B and T cells	3, 4, 5
5. Development, maturation and survival of lymphocytes	3, 7
6. Adaptive Immunity to Infection	7, 8, 9
7. Failures of Host Defense Mechanisms	8-12

- **Cognitive skills (thinking and analysis):**
  The instructor intends utilize his skills to present the material in the textbook in an interactive way that stimulates the thinking side of students' brains. Analyzing schematics and mechanisms in immunological responses in different settings will be an integral part of this course.

- **Communication skills (personal and academic):**
  The course will be taught in the English language. Students will be encouraged to communicate their ideas with the instructor at all times during and after the class. To facilitate discussions and asking questions, the instructor usually starts every lecture either by asking questions or giving a quiz about the previous lecture.

- **Practical and subject specific skills (Transferable Skills):**
  Some areas of immunology require specific skills in the transfer process of information from the instructor to the students. This, sometimes, might require the presentation of other instruments which will be very helpful if the students are enrolled in the laboratory class accompanying the immunology lecture class.

Allocation of Marks	
Assessment Instruments	**Mark**
First examination	20 %
Second examination	20%
Final examination	50%
Reports, projects, quizzes, home works, etc.	10%
Total	**100 %**

Documentation and academic honesty	
Cheating	Will not be allowed or tolerated
Attendance	Is mandatory. Students with more than 10% of class time absences will be dismissed form the class.
Graded Exams	3 exams, 40-50 questions in each exam, multiple choice, matching type, filling blanks, identifying molecules or mechanisms
Participation	Strongly encouraged, and will be calculated into the 10% of assignment part

Course/module academic calendar		
Week	**Topics**	**Chapter in Text (handouts)**
1-2	**Introduction to immunology**	1
3-4	**Innate immunity**	2
5-6	**Antigen recognition by B-cells**	3-4
First Examination		
7-8	**Antigen recognition by T cells**	3, 5
9-10	**Development and survival of lymphocytes**	7
11	**The Adaptive Immune Response**	8-9
Second Examination		
12	**Adaptive Immunity to Infection**	10
13	**Failures of Host Defense Mechanisms**	11
14	**Allergy and Hypersensitivity**	12
15	**Autoimmunity and Transplantation**	13
16	**Manipulation of the Immune Response**	14
Final Examination		

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references

Books

1. Basic Immunology, Updated Edition 2006-2007: with STUDENT CONSULT Access (Paperback). By Abul K. Abbas, Andrew H. Lichtman.
2. Immunology: With STUDENT CONSULT Online Access (Immunology (Roitt)) (Paperback). By David Male, Jonathan Brostoff, David Roth, Ivan Roitt.

Journals

1. Immunity
2. Journal of Immunology
3. European Journal of Immunology
4. TRENDS of Immunology
5. Immunology News
6. Clinical and Applied Immunology Reviews
7. Proceedings of the Academy of Science-USA

Websites

1. **www.garlandscience.com**
2. **www.studentconsult.com**