

## Immunology (MB 401) Syllabus

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### Course Description

This course will cover the basic principles of immunity. Topics to be covered include the cells, organs and molecules that mediate the innate and adaptive aspects of the immune system, structure, function and genetics of antibodies, T cell receptor, and Major Histocompatibility Complex molecules, infectious disease, immunodeficiency, cancer and hypersensitivity. Emphasis will be placed on understanding the cell and molecular basis of these immune processes. (3 hrs lect)

**Co-requisite:** CHEM 215 or CHEM 311

### Course Objectives:

The student will develop an understanding of the following concepts:

1. The distinction between innate and adaptive immunity and how these two types of host defenses differ with regard to combating infections.
2. The organization of the cells and organs of the immune system and how they relate to the processing of foreign substances and the development of the immune system.
3. How the cells interact with each other in the formation of an immune response.
4. The molecular basis by which the immune system identifies pathogens
5. The cell and molecular mechanisms mediating antigen-antibody interactions, antigen processing and presentation, and the genetic mechanisms that result in the diversity in immunoglobulin structure responsible for antigen recognition.
6. Cell mediated effector responses, inflammation and the roles that cytokines and complement cascades play in the mediation of these processes.
7. Basis of Immunodeficiency, autoimmune reactions, hypersensitivity reactions, and the immune response to infectious agents.

**Required Text:** Kindt, T.J., R.A. Goldsby, B.A. Osborne. *Kuby Immunology*; W.H. Freeman and Company; 6<sup>th</sup> Edition, 2006.

**Supplemental Materials:** [www.whfreeman.com/immunology6e](http://www.whfreeman.com/immunology6e)

**Website:** [www.homepage.montana.edu/~shalonen](http://www.homepage.montana.edu/~shalonen)

**Content**

1. Cells & organs of the immune system
2. Innate vs. Adaptive Immunity
3. Antigens, antibody structure & function and antigen/antibody reactions
4. Major Histocompatibility complex, Antigen processing & presentation, T cell Receptor
5. T and B cell development, activation and differentiation
6. Cytokines
7. Complement system
8. Cell Mediated effector responses
9. Infectious diseases and vaccines
10. Hypersensitivity
11. AIDS and immunodeficiencies
12. Autoimmunity and transplantation
13. Cancer

**Grading**

There will be 4 exams and a final exam. *The final exam is comprehensive and is optional. You may take this exam to replace one of your other test scores.* After the 4th exam, you will be given attendance points for coming to class. The grade breakdown will be as follows:

Exam I	100 pts
Exam II	100 pts
Exam III	100 pts
Exam IV	100 pts
Exercises	30pts
Attendance	<u>20 pts</u>
<b>TOTAL</b>	<b>450 pts</b>