Department of Biological Sciences  
BIO 401, Immunology  
Fall Semester 2005

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Office Hours: 11:30 – 12:30 PM Monday, Wednesday and Friday or by appointment. **Do not just show up outside office hours without an appointment!!**

Webpage: http://www2.nau.edu/~fpm/

Course Prerequisites: BIO 220 or 205, CHM 230 and 230L or CHM 235 and 238. Recommended CHM 360 (Biochemistry). Students who have not met the prerequisites will be administratively dropped.

Course Description: This course includes a detailed description of the immune response made in humans to foreign antigens including microbial pathogens. A description of cells involved in the immune response either innate or acquired. How the immune system recognizes self from non-self. B and T cell maturation and specific responses. Other topics covered will include the genetic basis of diversity of immune responses in mammals.

**Required textbook:** *Immunobiology*, 5th edition by Janis Kuby.

Lecture Meets: Mon-Wed-Fri from 10:20 to 11:10 AM in Room 256, Building 21.

Credit Hours: 4 credits total (3 credits for lecture which meets for 50 min, 3 times a week and 1 credit for the laboratory which meets for 2 hours and 50 minutes once a week.

Course Objectives:
1) To promote critical thinking among students; 2) to provide students with a foundation in immunological processes; 3) to provide students with knowledge on how the immune system works building on their previous knowledge from biochemistry, genetics, cell biology and microbiology; and 4) to provide an overview of the interaction between the immune system and pathogens.

Expectations of the Students:
1) Although there is a significant memorization component to this course, students will be tested on their problem solving abilities. Consequently students who simply memorize material in preparation for the examinations score much lower than students who actually understand the material and can apply what they know to problems that they have not seen before.
2) Students are expected to behave professionally at all times. For each hour you spend in lecture you will be expected to spend at least two hours in study and preparation outside the class. You will also spend time outside the laboratory writing lab reports, studying for quizzes, preparing for upcoming labs, etc.
3) Regular attendance is critical for success. It is recognized that absence from class is sometimes necessary. However, each student is accountable for all work missed due to any absence. The instructor is under no obligation to make special arrangements for students who have been absent.
4) Students are expected to be on time and leave the classroom when the instructor indicates the class is over. After the first week students coming late will have to use the “back door”.
5) Following exams the instructor will return graded exams within one week. If students come to ask
about the exam or for their grade prior to returning or posting of grades they will be penalized five points. You have one week from the time the exam is returned to argue or discuss any questions that you think you may deserve credit for. After this time I will clarify questions but you will not get credit.

6) No cell phones will be allowed in this class. You are welcome to switch the ringer but if the telephone rings off during class you will be expected to leave the classroom.

**Strategies for Success:** (these suggestions have helped students to be successful in the past):

1) Record the lecture on tape and then play it back while reviewing your lectures notes. This will also help you if you have problems with the Aussie-Tex-Mex accent of the instructor. Note that many students like to “re-write” their lecture notes. Unfortunately, this is a singularly unproductive study method for many students. It is much more efficient to edit the notes you already have (even if they are a bit messy) while listening to the tape.

2) Form small study groups. Immunology is a difficult subject, so forming small study groups early in the semester and getting together at least once a week to review that week’s material is very helpful. If you can explain the material to someone else, it is likely that you will understand it yourself.

3) Learn the material as you go along rather than trying to learn it just before the exam. There are three lectures of 50 minutes each and the amount of material really accumulates quickly.

4) If you have trouble getting to office hours, take advantage of the Learning Assistance Center (LAC) for questions about this topic, as well as for help on how to improve your study.

**Grading:** Your final grade is a combination of the course plus the laboratory. Your grade will be 75% from lecture exams and 25% from the laboratory. The lecture contains 3 cumulative exams worth 100 points, plus 1 cumulative final worth 150 points = 450 points total. The final exam will contain 40 -50 % new materials and 60-70% of previously covered material. The laboratory counts 25% (with a total of 300 points). To determine your final grade in the lab multiply the total number of points you earned in the lab by 0.084. Example, 250 points out of 300, now 250 X 0.084 = 21 points from the lab towards your final grade.

<table>
<thead>
<tr>
<th>Four one hour exams</th>
<th>Exam 1</th>
<th>100</th>
<th>Sept 21</th>
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<tbody>
<tr>
<td>Exam 2</td>
<td>100</td>
<td>Oct 14</td>
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<tr>
<td>Exam 3</td>
<td>100</td>
<td>Nov 7</td>
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<tr>
<td>Final Exam</td>
<td>150</td>
<td>Dec 10</td>
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This will count for 75% of your final grade

Laboratory grade (quizzes, exams, etc totaling 300 points). This will count for 25% of your final grade

**Note:** Students with 90 or better in each of the exams will be allowed to skip the final. A combination of 100 + 89 does not count……no exceptions!!!

**Cumulative Exams:** All exams are cumulative from the first day of class. This approach has four purposes: 1) it prevents the student from studying a block of material for an examination, taking the exam, and then forgetting the material, 2) it facilitates retention of basic concepts that you will be using in future courses, 3) it provides an opportunity for learning a concept that was not learned or not understood during the first presentation, and 4) reduces the tendency for students to decrease their grade in the course due to poor performance on the final exam. The final exam for this course will be on Wednesday December 7, and many students are ill prepared to take a cumulative final exam.
Exam Questions: This is a 400 level course so, exams will contain essay questions, short answers, problem solving, matching questions to diagrams, matching columns, and multiple choice. Exams may be composed of a single type of question or in any combination types. The best questions are those in which you need to describe and illustrate specific immune processes.

Note: Starting with exam 2 there will be ~40 new questions and ~10 questions from the previous materials.

Examination Make-up: Since you will be allowed to drop one exam, no make up exams will be offered. No exceptions.

Curving Exams: There are NO curves in this class.

Grading Policy:
A = 90-100%
B = 80-89%
C = 70-79%
D = 60-69%
F = below 60%

Study guides: All lecture exams will be preceded by a detailed study guide for students to use in preparation for their exam. The instructor reserves the right not to offer these study guides if students are not putting their effort in answering them.

Professional Conduct: Academic dishonesty (cheating or plagiarism) will result either in an F for that exam or an F for the entire course. Please note that we consider cheating and plagiarism as being equally unprofessional.

Note: The insurance policies carried by the university do not provide for medical coverage for students while participating in university related activities. Students are strongly encouraged to obtain their own medical/health insurance either through coverage using their parent’s insurance plans or purchasing their own insurance through the Fronske Health Center.

Tentative Lecture Schedule: No set timetable will exist to cover material. Although, the amount of material covered for each exam may vary from that in the lecture schedule, the EXAMS DATES ARE WRITTEN ON STONE. It is unlikely that we will have time to cover all of the material listed below.

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>CHAPTER</th>
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<tbody>
<tr>
<td>Aug. 29</td>
<td>Introduction; Innate versus Acquired Immunity</td>
<td>Chapter 1</td>
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<tr>
<td>Aug. 31</td>
<td>Introduction; Innate versus Acquired Immunity</td>
<td>Chapter 1</td>
</tr>
<tr>
<td>Sept 2</td>
<td>Blood Cells, Hematopoiesis &amp; Primary Lymphatic Organs</td>
<td>Chapter 2</td>
</tr>
</tbody>
</table>
Sept. 7  Blood Cells, Hematopoiesis & Primary Lymphatic Organs  Chapter 2
Sept. 9  Antigens and Immunogens  Chapter 3
Sept. 12  Antigens and Immunogens  Chapter 3
Sept. 14  Antibody Structure  Chapter 4
Sept. 16  Antibody Structure  Chapter 4
Sept. 19  Immunoglobulin Gene Organization  Chapter 5

Sept. 21  Exam 1

Sept. 23  Immunoglobulin Gene Organization  Chapter 5
Sept. 26  Primary Reactions, Antigen-Antibody Interactions  Chapter 6
Sept. 28  Major Histocompatibility Complex (MHC)  Chapter 7
Sept. 30  Major Histocompatibility Complex (MHC)  Chapter 7
Oct. 3  MHC Class, Antigen Presentation  Chapter 8
Oct. 5  MHC Class, Antigen Presentation  Chapter 8
Oct. 7  T-cell receptor gene organization  Chapter 9
Oct. 10  T-cell receptor gene organization  Chapter 9
Oct. 12  T-cell Differentiation and Maturation (Guest lecturer)  Chapter 10

Oct. 14  Exam 2

Oct. 17  T-cell Differentiation and Maturation  Chapter 10
Oct. 19  B-cell Differentiation  Chapter 11
Oct. 21  B-cell Differentiation  Chapter 11
Oct. 24  Cytokines and Their Receptors  Chapter 12
Oct. 26  Effector Cells: Helper T-cells  Chapter 12
Oct. 28  Secondary Reactions, the Complement System  Chapter 13
Oct. 28  Last day to drop with a W

Oct. 31  Secondary Reactions, the Complement System  Chapter 13
Nov. 2  Effector Cells: Cytotoxic T-cells  Chapter 14
Nov. 4  NK Cells and Antibody Dependent Cell-Mediated Cytotoxicity  Chapter 14

Nov. 7  Exam 3

Nov. 9  Lymphocyte Recirculation  Chapter 15
Nov. 14  Lymphocyte Recirculation (Guest Lecturer)  Chapter 15
Nov. 16  Delayed Type Hypersensitivity, Regulation of Immune Response  Chapter 16
Nov. 18  Delayed Type Hypersensitivity, Regulation of Immune Response  Chapter 16
Nov. 21  Immune Responses to Viruses, Bacteria and Protozoa  Chapter 17
Nov. 23  Immune Responses to Viruses, Bacteria and Protozoa  Chapter 17
Nov. 24/26  Thanksgiving Break; No Classes

Nov. 28  AIDS  Chapter 18
Nov. 30  AIDS  Chapter 18
Dec. 2  Autoimmunity  Chapter 20
Dec. 5  Autoimmunity  Chapter 20
Dec. 7  Transplantation Immunology  Chapter 21
Dec. 9  Transplantation Immunology  Chapter 21

Dec. 10  Final Exam  10:00-12:00PM