

## **BIOLOGY 485**

### **PRINCIPLES OF CELLULAR AND MOLECULAR IMMUNOLOGY**

#### **COURSE SYLLABUS**

San Diego State University  
Fall 2009

Monday and Wednesday 12:00 – 1:15 PM  
Room LS 111

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#### **Purpose of the course**

This course will introduce the student to the principles of modern Immunology, both at the molecular and cellular levels. The course is designed for students who take immunology for the first time. Discussions on experimental and technical details will be minimized for the benefit of emphasizing the overall concepts under study. The topics to be discussed along with assigned readings are listed at the end of the syllabus.

There will be extensive use of BB for communicating with the class and posting classroom material (announcements, lecture slides, extra reading, sample tests etc). Please familiarize yourself with its use. The instructor makes extensive use of visual displays in the lectures. For this purpose, the lecture slides have color and as a result, you will need to have a good computer and color printer to take full advantage of the lecture material. You can get access to computers and printers in the library. To facilitate downloading of files, I convert lecture slides to PDF files. To open these files, you will need Adobe Acrobat Reader v9.0 that can be downloaded free of charge.

#### **Prerequisites**

The prerequisite for this course is a good understanding of basic concepts of biochemistry, as well as cellular and molecular biology. Examples of such concepts can be found on the first page of the 'Study Guide' (see course website in BB). Because these concepts are fundamental to understanding principles of immunology, students must have taken the prerequisite courses, Biol. 202, Chem. 365, and Biol. 366 (the latter can be taken concurrently). Prerequisites will be strictly enforced. Students who do not meet them will be dropped from the class.

## Expected learning outcomes

The expected learning outcomes of this course is to attain a working knowledge of current immunological principles as they relate to the cells and molecules of the immune system, how they interact in defending the body against invading microorganisms, how they develop and acquire the ability to recognize antigens, and finally how they malfunction in autoimmune diseases and how they become inadequate in immune deficiency states.

## Textbook

**"The Immune System"** Third Edition by Peter Parham, will be the textbook utilized in this class. This is a new edition that is significantly revised from the second edition. Required reading assignments are listed at the end of the syllabus.

## Exams

There will be **two midterm** and **one final** examinations. The questions will be multiple choice, but the instructor reserves the option to change the format at any time. Questions in the exams will be derived from material covered in the lectures and in the reading assignments, the latter regardless whether they were discussed in class or not. The provided 'Study Guide' includes questions on the material that many exam questions are derived from.

The first midterm will include the material covered up to the time of the exam. The second midterm will include the material covered after the first midterm. The **final** exam will include **all material** covered in the course. Summary of topics covered in each exam, as well as sample questions with correct answers will be posted on BB before each midterm and final exams. Therefore, to help you prepare for each exam you will have the 'Study Guide', sample questions (with answers) and topics I will post on BB, and the Questions listed at the end of each chapter in your textbook. Keep in mind these are only guides and keeping up with reading the assigned pages and studying your notes on a regular basis is of the utmost importance. Past experience indicates that cramming does not work for this course. The questions in each midterm exam with correct answers will be reviewed in the session following the exam. The purpose of this is instructional and it is not meant for memorizing the question and the answer. There is no value in memorizing the questions and the answers. What is important is understanding the reasoning behind the answer to each question. For this purpose, exams are not returned or posted.

**Exam Dates:** 1st midterm on **September 30**, second midterm on **November 2**, final exam on **December 16**.

No make up exams will be given. Situations beyond an individual's control (critical illness, emergencies etc) will be dealt with on an individual basis. It is the student's responsibility to justify such situations. Having to take more than one midterm on the same day or having an interview or an appointment of a non-emergency nature does not constitute justifiable reasons. Please arrange such commitment so they do not coincide with the midterm dates. The final will not be given earlier or later than its scheduled day unless there is a very important reason (critical illness, family emergency etc).

**Extra credit:** You can earn up to 30 points in extra credit. This is equivalent to about 10% of the total points in the course. This gives you the opportunity to improve your final grade by up to one grade level. Extra credit does not mean 'free points'. See the 'Extra Credit Assignments' link in BB to find out how you earn extra credit.

## Grading

The following will be an approximate grade distribution: First midterm ~20%, second midterm ~30%, final exam ~50%. The actual distribution may vary. Letter grading will be assigned as follows:

A = 92-100%	B+ = 88-89%	C+ = 78-79%	D = 60-69%
A- = 90-91%	B = 82-87%	C = 72-77%	F < 60%
	B- = 80-81%	C- = 70-71%	

If you earn half of the bonus points (15 pts), I will bump you up to the next grade level if you are at the border of the scale (e.g. 89% will earn you A- etc).

## Consequences of the furlough implementation

As you all probably know California public universities have been subjected to severe budget cuts due to the financial shortfalls the state is facing. In an effort to address these severe budget cuts the Chancellor of the CSU has implemented a furlough program for all campuses including SDSU. A furlough entails faculty taking leave of absence without pay. For the Fall semester 2009, each faculty member will have to take 9 such furlough days. The number of furlough days has to be distributed equally among the various duties of each professor including teaching. I have decided to limit the number of furlough days I will take on teaching days to two out of the total nine I am obligated to take. My furlough days during which I will not be in class are **October 26** and **November 25**. It is obvious that the consequence of my absence will be that less of the assigned reading material will be covered in lecture. However, you will still be responsible for this material. Furthermore, furlough will impact the days on which I will be available for office hours and consultation. The best way to mitigate this will be to address your questions to me via e-mail.

I think the impact of the furlough implementation on the quality of this course (and most likely all other courses you are taking) will be serious in many ways. For this course the impact on quality will be on at least three levels: 1) I teach the course as a continuous story with each lecture building upon the previous one and preparing you for the next. Unfortunately, the days that you will have to do this on your own will break the continuum and it may impact your ability to fully assimilate the information. 2) The fiscal impact has necessitated an increase in class size. The larger size makes it difficult, if not impossible, to conduct interactive reviews before the exams. So, there will be no reviews before any of the exams. To mitigate this I will put practice questions on BB the week before the exams. 3) Another learning tool I had implemented in this course was to go over the exams immediately afterwards. However, the lost time due to the furlough will not make this possible. To mitigate this I will go quickly over the answers to each exam the session following the exam. My policy of giving out the exams will not change.

Implementation of the furlough program has created a very uncomfortable situation for all your professors and I am sure that consequentially will be uncomfortable for you also. You, the students, are already paying the penalty in terms of increased tuition, lower enrollments (no enrollments for Spring), crowded classes, and, unfortunately, lower quality of what you pay for. Unfortunately, we are all paying for the consequences of the fact that the state of California has decided to severely compromise our educational system instead of solving its financial crisis through other avenues. So, if you feel that the quality of your education has been compromised, I urge you to contact your state legislator and voice your opinion.

### Outline of Topics and Reading Assignments

Topic	Required Reading (pgs)	Approximate # of Lectures
Course Business Matters Cells and Organs of the Immune System	1-8, 12-23	2
Innate and Adaptive Immunity	8-11, 23-26, 31-45, 71-75	1
Cellular Interactions in the Immune System	45-49, 53-58, 75-76, 102-105, 211-219, 241-242	1
Antibody Structure and Antigens	95-102, 263-272,	2
<b>1st Midterm</b>	Pages above	<b>September 30</b>
MHC and Antigen Processing/Presentation	76-81, 125-126, 132-154, 336	2.5
T Cell Development and Activation	81-83, 129-131, 187-203, 219- 224	3
Cytokines	49-53, 62-64, 224-228, 231-234	1.5
<b>2nd Midterm</b>	Pages above after 1 <sup>st</sup> midterm	<b>November 2</b>
B cells Development and Activation	83-90, 159-168, 174-180, 249- 262, 502-503	2
Genetic Basis of Antigen Recognition	105-116, 126-129	3
Immune Effector Mechanisms	65-67, 117-119, 229-230, 234- 240, 272-275, 317-324	1
Hypersensitivity Reactions; Autoimmunity	309-310, 365-394, 403-416	1.5
Acquired Immunological Deficiencies	351-360	1.5
<b>Final Exam</b>	All pages above	<b>December 16 10:30 – 12:30</b>