

## **BIOL 4100: IMMUNOLOGY**

### Syllabus for Spring 2010

**LECTURE:** Biology 4100 (20118)

**PLACE:** N 101

**TIME:** TR 9:40 - 11:07am

**TEXTBOOK:** **Janeway's Immuno biology. Murphy, et al, 7th edition** - Compulsory purchase.

**OTHER:** **Website:** <http://www.drdulai.com/csustan/>  
**Prerequisite:** BIOL 3310, BIOL 3350, MBIOL 3010, CHEM 4400, or consent of instructor.

**INSTRUCTOR:** Dr. Kamal Dulai  
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**Email:** [kdulai@csustan.edu](mailto:kdulai@csustan.edu)  
**Office:** N 252 (New Science Building)  
**Office Hours:** TR 8:40-9:40am. Also by appointment

### **COURSE ORGANIZATION**

Immunology is primarily a lecture course presented as three 58-minute lectures each week. Demonstrations will be used to illustrate particular principles, as applicable. The course content is structured to continuously build upon previously taught material. This is one course where one definitely must keep abreast of the subject matter and study after each class as opposed to trying to 'catch up' prior to the exams. It is also recommended that students retain and consult their syllabus, visit the supporting web site, and read associated text chapters. Each exam shall be comprehensive in that it will encompass material covered up until that point from the start of the course. Questions shall appear in the form of any of the following: multiple-choice, best answer, short and/or long answers.

### **COURSE OBJECTIVES**

Immunology is the study of an organisms' protection from foreign macromolecules or invading organisms and the resulting responses to them. Elaborate mechanisms exist to prevent autoimmunity. The first line of defense is provided by the innate or non-specific immune system, which is readily armed to respond to invasion. The second line of defense is the specific or adaptive immune system which may take days to respond to a invasion, where one sees the production of antibodies and various cell-mediated responses. This course is designed to provide an in-depth, biological review of the principles of immunology, with particular emphasis on human and mammalian systems.

By the end of the course, the student should:

- Understand the key features relating to the structure and function of the main components involved in the immune responses including antigens, antibodies, leucocytes and the various organs and tissues of the lymphoid system
- Appreciate the molecular and cellular basis of B- and T-cell responses, the importance of cell to cell interactions and the cytokine network
- Be able to differentiate between protective and potentially damaging immune responses
- Understand the principles behind representative immunoassays
- Enhance critical thinking and problem-solving skills and the ability to effectively communicate with

and work with others.

### COURSE SUPPORT

A web site will provide supplemental material for all students. Links to useful resources will be provided as the course progresses. The site shall be updated each week, at the minimum, so students are encouraged to visit it on a regular basis. Handouts and instructions for completing term papers shall be provided on this website.

Address: <http://www.drdulai.com/csustan/>

### POLICIES & PROCEDURES

Please carefully familiarize yourself with the policies below. It shall be assumed that you have read and understood them.

### SCORES & GRADES

#### Course Scoring:

Assignment	Point Allocation	Total Points	% of Total Points
Exams (Midterms)	200 points each x 3	600	60%
Final Exam	300 points x 1	300	30%
Term Poster	100 points x 1	100	10%
	<b>Total</b>	<b>1000</b>	<b>100%</b>
Attendance & Participation Points (see below)		50	

**Letter Grades:** The final distribution of grades in BIOL 4100 is given below. Sorry, no exceptions shall be made!

Course Point Score	Letter Grade	Course Point Score	Letter Grade
88.00% to 100.00%	A	68.00% to 70.99%	C
85.00% to 87.99%	A-	65.00% to 67.99%	C-
81.00% to 84.99%	B+	61.00% to 64.99%	D+
78.00% to 80.99%	B	58.00% to 60.99%	D
75.00% to 77.99%	B-	55.00% to 57.99%	D-
71.00% to 74.99%	C+	0.00% to 54.99%	F

Information on grade appeals, incompletes, etc. can be found in the *Student Handbook* available from the Registrar.

#### Lecture Mid-term Exams:

As indicated in the syllabus, three exams will be given during the indicated lecture periods. These may consist of multiple choice, mix and match, fill-in and/or short answer questions.

Midterm exams are **cumulative**. You are expected to be familiar with the material covered in previous assessments, and shall be tested on it.

#### Final Exam:

A two and half hour **cumulative** final exam will be given during finals week. The final may consist of any style of questions, including short answer essay questions.

**BEWARE:** You may be asked specific questions on material covered by **any** component of the course; exams, labs, discussions, and lectures.

**BEWARE:** Note the time for the final and place may be different from the regular lecture times.

#### Lecture Attendance & Participation

**Students should attend all lectures.** Attendance shall be taken each lecture and bonus points (**1 per lecture x 30 lectures = 30 points**) shall be awarded for attendance. A further **10 bonus points** shall be awarded automatically should you attend 80% (24 out of 30) of lectures for a maximum of 40 bonus points. A further **10 points** shall be awarded for participation in lectures.

**Bonus Points**

During the semester occasions **may** arise where the teaching staff may offer all students the opportunity to make up missed points on select portions of exams by completing homework assignments. These points shall be added to your examination grade as appropriate.

**Study Groups**

Although not mandatory, students are **strongly** encouraged to form large (6-15) member study groups, which should meet outside official course hours and tackle course material. Based on data from previous years, these study groups have provided an 18 point advantage on average. *(It should be mentioned here that for most of you this is your first year at University, and high school study habits may not suffice)*. You are encouraged to meet with the lecturer early in the course and discuss your learning methodology.

**GENERAL****Course Participation:**

Participation in this course is strongly encouraged. It helps students and teaching staff clarify material, and promotes scientific dialogue. For students whose final scores fall right on the border of a grade change (ex. A-/B+), active engagement and participation in the course **may** increase your chances of receiving the higher score. *This would be exclusively at the discretion of the instructor.*

**Course Materials and Handouts:**

In addition to the textbook and class handouts, computer and internet access may be required for this class. For students who do not otherwise have access to a computer or the internet, computers will be available at several campus locations including the main reading room in the library. Copies of the lecture PowerPoint's will also be available in Acrobat format (.pdf files) at the BIOL 4100 web site after the lecture has taken place.

**Regrade policy:**

Regrade requests will only be accepted within **one week** (7 days) from the date a scored assessment is returned. For each question requiring attention, you must submit a written explanation describing why you believe your response should be reevaluated. Please know we reserve the right to regrade your **entire assessment**. As a result, your score could either increase or decrease.

**BEWARE:** A random sample of all assessments will be photocopied after initial grading. If a comparison of the photocopy to the exam submitted for regarding indicates any alteration, the case will be forwarded to the Office of Judicial Affairs. Never alter any exam material returned to you.

**Student Services:**

If any student with any form of learning disability wishes or has registered for this course they should contact the instructor as soon as possible so rapid arrangements can be made to address those needs. CSU Stan and this instructor are committed to making our courses accessible to all students, including students with limited mobility, impaired hearing or vision, and learning disabilities. Students who may need academic accommodation(s) services should also contact the Disability Services office as early as possible in the semester so that appropriate arrangements can be made.

**Missed Exams:****Make-up exams will not be offered for any midterm assessments.**

Students who miss a midterm will receive a zero for the entire test unless they provide documentation for one of two acceptable excuses:

1. Incapacitating illness or accident--requires a note from student's physician (not a family member) or from the Health Center.
2. Death or serious illness of an immediate family member—requires proper documentation.

Students with a **documented excuse** (see above) will receive a provisional grade on the midterm based on the average of the student's other assessment grades. Students who miss the final assessment will receive a grade of "F" for the course unless an acceptable excuse is provided (see list above), and the student was achieving a passing grade (C- or better) in all course work up until the final exam. Such students can arrange with the instructor for a process to remove the incomplete from their records.

Students who have a documented reason, such as a religious observance or an academic or professional activity (e.g. graduate school interview) may request to take a midterm exam *before* the

scheduled exam time. Appropriate proof must be supplied to the instructor. Students taking an assessment early may not discuss any aspect of the assessment with other students in the class; to do so is a serious breach of academic integrity (see below). Students seeking to reschedule an assessment should contact the instructor as early as possible, ideally during the first two weeks of the semester.

**Group and independent assignments in BIOL 4100:**

Some activities in BIOL 4100 involve group work and we encourage you to discuss any of the materials in the text, lectures, labs or computer exercises with the instructors and other students, **but the work you submit must be your own for all of the following:**

- Homework
- Midterm and final assessments

That is, each student must generate their own answers **written in their own words** to all written questions. At the first instance of copied answers on assignments, no credit will be given to *all students with duplicate answers* and the assignments will be forwarded to the Vice-Chancellor for Undergraduate Affairs and the Office for Judicial Affairs. Subsequent copied assignments could lead to dismissal from course or university (see section on Academic Integrity below).

**Add/Drop Policies:**

The C.S.U.S. 2006-07 Class Schedule details the University's add/drop policy. Students should evaluate whether they have the time to devote to the class before adding the class. In order to drop the course after the Census Date, students are required to provide documentation to verify their extenuating circumstances. Forms are available in the Biological Sciences Department office and online.

**Academic integrity:**

Academic integrity is the foundation of an academic community and without it none of the educational or research goals of the university can be achieved. All members of the university community are responsible for its academic integrity. Existing policies forbid cheating on examinations, plagiarism and other forms of academic dishonesty. Students should review the University policy on plagiarism provided on the web.

**Examples of academic dishonesty include:**

- **receiving or providing unauthorized assistance on examinations**
- **using unauthorized materials during an examination**
- **plagiarism – using materials from sources without citations**
- **altering an exam and submitting it for re-grading**
- **fabricating data or references**
- **using false excuses to obtain extensions of time or to skip coursework**

The ultimate success of a code of academic conduct depends largely on the degree to which the students fulfill their responsibilities supporting academic integrity.

These responsibilities include:

- Be honest at all times.
- Act fairly toward others. For example, do not disrupt or seek an unfair advantage over others by cheating, or by talking or allowing eyes to wander during exams.
- Take group as well as individual responsibility for honorable behavior. Collectively, as well as individually, make every effort to prevent and avoid academic misconduct, and report acts of misconduct that you witness.
- Do not submit the same work in more than one class. Unless otherwise specified by the instructor, all work submitted to fulfill course requirements must be work done by the student specifically for that course. This means that work submitted for one course cannot be used to satisfy requirements of another course unless the student obtains permission from the instructor.
- Unless permitted by the instructor, do not work with others on graded coursework, including in class and take-home tests, papers, or homework assignments. When an instructor specifically informs students that they may collaborate on work required for a course, the extent of the collaboration must not exceed the limits set by the instructor.
- Know what plagiarism is and take steps to avoid it. When using the words or ideas of another, even if paraphrased in your own words, you must cite your source. Students who are confused about whether a particular act constitutes plagiarism should consult the instructor who gave the

assignment.

- Know the rules – ignorance is no defense. Those who violate campus rules regarding academic misconduct are subject to disciplinary sanctions, including suspension and dismissal.

**Flexibility Clause:**

Circumstances may arise during the course which may prevent the instructor from fulfilling each and every component of this syllabus. Therefore, the syllabus should be viewed as a guide and is subject to change. Students will be notified prior to any changes, if possible.

**Welcome & Great Learning!**

**Biol 4100 - Spring 2010 - Lecture Timetable:**

No.	Date	Lecture Topic	Chp.	Pages
1	T 16 Feb	Introductions & Expectations; Syllabus Overview		
2	R 18 Feb	Overview of Immunology; Principles of innate and adaptive immunity	1	1-27
3	T 23 Feb	Recognition and effector mechanisms of adaptive immunity	1	27-37
4	R 25 Feb	Front line of host defense	2	40-59
5	T 2 Mar	Complement system and innate immunity	2	61-81
6	R 4 Mar	Induced innate responses to infection	2	82-103
7	T 9 Mar	<b>Mid-term 1</b>		
8	R 11 Mar	Antigen Recognition	3	111-138
9	T 16 Mar	Gene rearrangements	4	143-159
10	R 18 Mar	Immunoglobulin C-region variation	4	160-175
11	T 22 Mar	Generation of T-cell receptor ligands	5	181-195
12	R 25 Mar	MHC and its functions	5	196-212
13	T 30 Mar	Principles of transmembrane signaling	6	219-234
14	R 1 Apr	<b>Mid-term 2</b>		
-	T 6 Apr	<b>April 5-9 Spring Break (No Class)</b>		
-	R 8 Apr	<b>April 5-9 Spring Break (No Class)</b>		
15	T 13 Apr	Antigen receptor structure and signaling pathways	6	235-253
16	R 15 Apr	Generation of lymphocytes in bone marrow and thymus	7	257-288
17	T 20 Apr	Survival and maturation of lymphocytes in peripheral lymphoid tissues	7	288-313
18	R 22 Apr	Production of activated effector T-cells	8	323-356
19	T 27 Apr	General properties of armed effector T-cells	8	356-372
20	R 29 Apr	<b>Mid-term 3</b>		
21	T 4 May	B-cell activation by armed helper T-cells	9	379-399
22	R 6 May	Distribution and functions of immunoglobulin isotypes	9	400-416
23	T 11 May	Course of an infection & memory	10	421-454
24	R 13 May	Mucosal immune systems	11	459-490
25	T 18 May	Aids	12	527-546
26	R 20 May	Allergic reactions	13	566-583
F	May	<b>EXAM FINAL - Tuesday June 1<sup>st</sup> 2010 @ 8:30am</b>	-	-

PLEASE NOTE: Exams shall use Scantrons. Scantrons will not be provided; please buy a pack from the bookstore. Always bring Scantrons with you to all sessions.

**Learning Outcomes for Biol 4100**

1. Demonstrate an in-depth knowledge and understanding of major cellular and molecular mechanisms underlying immunological processes in health and disease.
2. Relate understanding of basic processes by which the immune system works to how it may malfunction in disease, such as allergy and autoimmunity.
3. Ability to apply knowledge gained to the solution of practical and theoretical problems, and to communicate these effectively, both verbally and in writing.
4. Discuss critically the current understanding of the molecular and cellular basis of the immune system, together with new developments and challenges in this field.
5. Acquisition of self-directed learning skills.