

MICR 4600 Theoretical and Applied Immunology Spring 2020

REVISED 4.07.2020

Lecture Section 01 (Class #33919): TR 12:15 – 1:30 pm, Zoom room: <https://calstatela.zoom.us/j/769833821>

Laboratory Section 02 (Class #33920): W 8:00 – 10:30 am,

Laboratory Section 03 (Class #34443): R 1:50 – 4:20 pm,

Instructor (Lecture)

- Name: **Dr. Edith Porter**
- Student hours: TR: 10:00 – 10:30 am; (beginning 3.17.2020: Zoom room <https://calstatela.zoom.us/my/edith.porter>); inquiries via email: any time
- Academic advisement: Mondays 8:00 am – 9:00 am (beginning 3.17.2020 Zoom room <https://calstatela.zoom.us/my/edith.porter>)
- Contact information: eporter@calstatela.edu (preferred)

Instructor (Lab)

- Name: **Bita Bahrami**
- Student hours: MW: 10:30 – 11:30 am
- Zoom room: <https://calstatela.zoom.us/j/931325884> (Section 02) and <https://calstatela.zoom.us/j/698457319?pwd=eWkyHVkdDZjL3pRT1V4MzVyK2tLQT09> (Section 03)
- Contact information: bbahram4@calstatela.edu

Prerequisites:

- MICR/Biol 3100 or MICR 2010/2020 and CHEM 2200 and CHEM 2201, each with a grade C or higher, or instructor consent.

CANVAS:

- The course will be administered through CANVAS using section MICR 4600-01 only.
- All course related materials for lecture and labs will be accessible through CANVAS.
- Enrolled students automatically have access to the course web site in CANVAS through their myCSULA portal.
- You can access the Canvas Student Guide by clicking the Help icon on the left side of the CANVAS page or by going to <https://community.canvaslms.com/docs/DOC-10701>. Contact your instructor if you still have trouble accessing CANVAS.
- Lectures and labs will be delivered through Zoom beginning 3.17.2020.

Labster:

- Several labs will be conducted online through Labster. Log in information will be provided by the lab instructor and posted in CANVAS

Email account:

- You must have a CalState LA email account to access CANVAS and receive course related information. To contact your instructors you must use your CalState LA email account.

Textbooks:

- **Lecture:** Janeway's Immunobiology; 9th Edition by Murphy; Publisher: Taylor; ISBN: 9780815345053. While the 9th edition is preferred you can also work with the 8th edition. The textbook is available at the University Bookstore. Chegg, Amazon, and Knetbooks, among others, offer alternative affordable rent solutions. Free online immunology textbooks can be accessed through merlotx.org, however, they are somewhat outdated.
- **Laboratory:** The laboratory manual by Dr. Edith Porter is available as PDF file on the course web page. Print it (no need for color printing) and place the pages in a dedicated binder. The manual will also serve as your laboratory notebook and will be graded at the end of the course.

Student learning outcomes: Upon successful completion of this course you will:

- be able to define the key players of the immune response and explain how the response is orchestrated
- be able to apply this knowledge in understanding diseases arising from a dysfunctional immune system
- have been introduced to fundamental techniques used in clinical immunology
- appreciate how immunology can be used as a tool in research settings
- have deepened familiarity with a biomedical laboratory environment
- have gained enhanced skills in scientific data recording, analysis, interpretation, and dissemination
- have improved your ability to formulate questions

Attendance:

- Lecture and laboratory attendance is mandatory. Recurrent late arrival time to the lab sessions and not observing lab safety and housekeeping rules will lead to point deductions. Students missing more than **one** laboratory session are in danger of not receiving course credit.
- Some experiments may run longer than the allotted class time and for some experiments, you have to come in the following day to read results.

Performance evaluation: 1000 points total

Lecture: 600 points

- 20 Pre- and post-course reflective essays (2 worth 10 points each)
- 80 Active learning**
- 80 Case studies (team work; 3 worth 10 points each, 1 final case study worth 50 points)
- 40 Seminar synopsis and research question
- 150 Weekly post-lecture quizzes (15 worth 10 points each)
- 100 Midterm
- 130 Final comprehensive examination**

You will write two **reflective essays**, one at the very beginning of the class, and one at the end of the class. Instructions for these essays will be posted on CANVAS. These essays aim to help you connect with the class and shall establish early on significance of the class content. **Active learning exercises** will consist of various group and individual activities and will be incorporated in lecture. The points assigned are for participation. **Case studies** will help you to apply your theoretical knowledge to the clinical settings. The cases will be assigned to teams. Detailed instructions for the case studies including resources will be posted on CANVAS. **Asking questions** is the beginning of research and advancement of knowledge occurs through finding answers to these questions. This course aims to improve your ability to ask research questions and draws from Santana, L., & Rothstein, D. (2011). "Make just one change: Teach students to ask their own questions. Harvard Education Press: Cambridge, MA". We will first learn how to ask questions in general and then apply the newly gained skill in conjunction with a research seminar given by our Guest Speaker Dr. Julie Jameson, CSU San Marcos. A **seminar synopsis** will be prepared based on the seminar presented by Dr. Jameson. You will summarize the presentation, critically evaluate the talk and its content, briefly discuss how this relates to our class, and then present your own unique research questions ignited by the seminar. To help you process the lecture material in a timely fashion, there will be **weekly CANVAS quizzes** covering the lectures from the preceding week. The quizzes will open Thursday evenings, allow for two attempts (higher score counts), and will close Sunday nights at 23:55 (11:55 pm). Midterm and final examination will include 10 points for a **brief report on a current news article** (published during the term of this semester) in the general news (newspapers, web etc.) that relates to immunology, either in health and disease or as a tool for diagnostic or research. An article from a science journal is not appropriate. The typed news report will be in the following format: indicate title and author(s), the source and date of publication; a summary of the article in your own words (~ ½ page), a short description of what captured your attention/why you chose this article, and a brief discussion how the selected article relates to immunology and this class specifically. You will turn in the completed report along with a hard copy of the news article during the lecture exam. **Midterm** and **final lecture exams** will consist of multiple choice questions, short answers, some drawings (e.g. structure of an antibody molecule) and fill-ins. **The final exam will be a timed online exam.**

Laboratory: 400 points

- 45 Weekly CANVAS prelab quizzes (9 worth 5 points each)
- 10 Safety quiz
- 60 Face-to-face quiz 1 and 2 (30 pts each)
- 30 3 Graphs (10 pts each, due 1 week after completion and class discussion of the experiment)
- 35 Labster Quizzes (5 points each)
- 50 Poster session (Poster 30, Poster presentation 10, Poster evaluations 10)
- 40 Notebook
- 130 Final comprehensive examination

We will handle human and other animal blood products and body fluids. Thus, an **individual general release form** must be signed in order to participate in all laboratory exercise. To ensure proper preparation for the lab exercises **weekly pre-lab quizzes** will be administered through CANVAS. These multiple choice quizzes are based on the posted laboratory manual and allow only a single attempt. They will open Thursday evenings and close Mondays at 11 am. Labster exercises are online virtual lab exercises. Students will go through the assigned labster exercises during lab time and take the associated tests. **Quiz 1** will be face to face, **Quiz 2** will be a timed online quiz given during the regular lab hours. The **final exam** will be also a timed online exam and will include but are not limited to questions with short answer prompts, fill-in tables, simple calculations, data analysis, and interpretation of graphs. Detailed instructions for **graphs**, **poster**, and **notebook** are included in the lab manual and will be reiterated in class.

Grades: Based on the total points accumulated you can earn:

	B+: ≥ 86 % (860 pts)	C+: ≥ 76 % (760 pts)	D+: ≥ 66 % (660 pts)
A : ≥ 92 % (920 pts)	B : ≥ 82 % (820 pts)	C : ≥ 72 % (720 pts)	D : ≥ 63 % (630 pts)
A- : ≥ 89 % (890 pts)	B- : ≥ 79 % (790 pts)	C- : ≥ 69 % (690 pts)	D- : ≥ 60 % (600 pts)
			F : < 60 % (< 600 pts)

In borderline cases (grade levels) class participation laboratory performance will be considered for the final grade.

Study suggestions:

- Always read the assigned chapter and study in particular the accompanying illustrations before attending lectures. Re-read the chapter in detail according to the lecture after you have attended the lecture.
- You must have carefully read the laboratory manual for the experiment of the day before coming to lab. Weekly pre-lab quizzes will test your preparedness.
- Form study groups with your peers and discuss what is happening in class. Create your own tables and concept maps.
- Contact your instructors by email and/or visit office hour when you are unclear about the material covered.
- Utilize the resources at the writing center (http://www.calstatela.edu/centers/write_cn/).
- Learn to recognize when you need help, and get help in a timely manner.

Keep track of your points:

	Assignment	Max Pts	Your Pts
Lecture	Reflective essay 1	10	
	CANVAS post-lecture quizzes	150	
	Case study 1	10	
	Case study 2	10	
	Case study 3	10	
	Final case study	50	
	Seminar synopsis & research questions	40	
	Midterm	100	
	Final comprehensive examination	130	
	Active learning	80	
Lab	Reflective essay 2	10	
	CANVAS pre-lab quizzes	45	
	Safety Quiz	10	
	Labster Quizzes	35	
	Quiz 1	30	
	Quiz 2	30	
	Graph 1	10	
	Graph 2	10	
	Graph 3	10	
	Notebook	40	
	Poster session	50	
	Final comprehensive examination	130	
	Extra credit	-	
	Minus points	-	
TOTAL	1000		

General Policies:

No make-up examination/test/quiz/reports. Missed events will be set as “0 points” unless satisfactorily justified (e.g. doctor’s note). **Assignments turned in late will not be accepted!** No make-up laboratory sessions. Lecture and Laboratory absences need to be satisfactorily justified (e.g. doctor’s appointment), and you are responsible to acquire the missed material. You must provide your own **laboratory coat, safety glasses, grease pen, pencil and colored markers**. Please inform the instructor immediately about any allergies against gloves. The Drop/Incomplete and Academic/Honesty policies explained in the University General Catalogue will be strictly followed. Students are expected to read and abide by the **University’s Academic Honesty Policy**, which can be found at <http://www.calstatela.edu/academicenate/handbook/ch5a>. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation. **You are responsible for the prerequisites** for this course and are encouraged to discuss any questions regarding the policies and prerequisites with the instructor. **Students with disabilities:** Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. Please contact the instructor ASAP to arrange appropriate accommodations!

You are strongly encouraged to work with the instructors throughout the course.

Planned Schedule (subject to change)

Week	Day	Date	Lecture	Day	Date	Lab Experiment
1	T R	1.21.20 1.23.20	Course requirements, student assessment Overview (Chapter 1) History and major concepts of immunology Cells, organs, and microenvironments of the immune system Introduction to cytokines Reflective essay 1 due (10 pts)	W R	01.22.20 01.23.20	Check in, laboratory and safety rules Microscopy (blood cells, lymphatic organs)
2	T R	1.28.20 1.30.20	Innate Immunity Anatomical barriers (Chapter 2) Antimicrobial peptides & lipids (Chapter 2) Question formulation exercise	W R	1.29.20 1.30.20	Cation depletion of saliva Lysoplate (1. Graph 10 pts)
3	T R	2.04.20 2.06.20	Complement (Chapter 2) Case 1 (10 pts) Epithelial cells (Chapter 2) Pattern recognition receptors (Chapter 3)	W R	2.05.20 2.06.20	Radial agar diffusion with <i>E. coli</i> Epithelial cells and normal microbiota
4	T R	2.11.20 2.13.20	Phagocytes, Chemotaxis (Chapter 2,3) NK cells (Chapter 3) Induced responses of innate immunity (Chapter 3)	W R	2.12.20 2.13.20	Complement total hemolytic activity Discuss: complement fixation reaction Bloodborne pathogen training (PP) (Safety Quiz 10 pts)
5	T R	2.18.20 2.20.20	Adaptive Immunity Lymphocytes, lymphocyte receptor signaling (Chapter 7) Antibodies I (Chapter 4)	W R	2.19.20 2.20.20	Phagocytosis Quiz 1 (30 pts)
6	T R	2.25.20 2.27.20	Antibodies II (Chapter 5) B cells (Chapter 8) Case 2 (10 pts)	W R	2.26.20 2.27.20	CRP agglutination Immune electrophoresis (#272) Radial immunodiffusion (#273) (2. Graph 10 pts)
7	T R	3.03.20 3.05.20	Midterm (100 pts) T cells I (Chapter 4, 5)	W R	3.04.20 3.05.20	Quantitative ELISA (#278)
8	T R	3.10.20 3.12.20	T cells II (Chapter 8) MHC complex (Chapter 6)	W R	3.11.20 3.12.20	SDS-PAGE (saliva) Lysozyme immunoblot – Day 1
9	T R	3.17.20 3.19.20	T cell mediated immunity I (Chapter 9) The humoral immune response (Chapter 10)	W R	3.18.20 3.19.20	Lysozyme immunoblot – Day 2 (3. Graph 10 pts)
10	T R	3.24.20 3.26.20	Integrated dynamics of the innate and adaptive immune response (Chapter 11) The mucosal immune response (Chapter 12)	W R	3.25.20 3.26.20	Detection of antinuclear auto-antibodies (discussion)
Spring Break- No classes 3.30.20-4.05.20						
11	T R	4.07.20 4.09.20	Failures of the Immune system Immunodeficiencies I (Chapter 13) Guest Seminar: Dr. Julie Jameson, CSUSM	W R	4.08.20 4.09.20	Quiz 2 (30 pts) Introduction to Flow (lecture only, PP, online tutorials) Labster: Introduction to Immunology Labster: Hematology - Introduction to blood Labster: ELISA (for self study, not graded)
12	T R	4.14.20 4.16.20	Immunodeficiencies II (Chapter 13) Case 3 (10 pts) Allergies and allergic diseases (Chapter 14)	W R	4.15.20 4.16.20	Labster: Antibodies Labster: Experimental design
13	T R	4.21.20 4.23.20	Tolerance, autoimmunity, and transplantation (Chapter 15) Cancer and the immune system (Chapter 16)	W R	4.22.20 4.23.20	Labster: Signal Transduction: How cells communicate Labster: Gene regulation Poster preparation

14	T	4.28.20	Clinical Applications of Immunology Serology Vaccines (Chapter 16)	W	4.29.20	Poster session online
	R	4.30.20		R	4.30.20	
15	T	5.05.20	Immunotherapies (Chapter 16)	W	5.06.20	Lab final online 9:00 am – 10:30 am 2:50 pm – 4:20 pm
	R	5.07.20	Final Case study Presentations (50 pts)	R	5.07.20	

Final Examination (130 pts): Online Tuesday May 12, 12:00 – 2:00pm

Reflective essay 2 due Friday, May 8, 2020; 11:55 pm