BIMM 124: Medical Microbiology, Fall 2014

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Class meets at:
York 2622
MWF 10:00 – 10:50 am
Website: http://ted.ucsd.edu

Office hours: Fridays 11:10-noon in York 2300.

Teaching Assistants office hours

Name	Day	Time	Location	email
Justine Swann	Mon	9-9:50 AM	Loft Cafe	jswann@ucsd.edu
Jane Klann	Wed	9-9:50 AM	Leichtag Biomedical building lobby	jklann@ucsd.edu
Grace Liu	Wed	11:15-12:15	MOM's (under pines, the coffee shop in Muir)	g4liu@ucsd.edu

Sections

Section	Days	Time	Location	TA
A01	Mon	2-2:50 PM	HSS 2150	Jane Klann
A02	Mon	3-3:50 AM	HSS 2150	Jane Klann
A10	Wed	4-4:50 PM	CNTR 217B	Grace Liu
A05	Wed	5-5:50 PM	CNTR 207	Grace Liu
A06	Wed	6-6:50 PM	CNTR 207	Justine Swann
A07	Wed	7-7:50 PM	CNTR 207	Justine Swann

Introduction

The near doubling in lifespan in the past 1-2 centuries has been due mostly to our control of infectious diseases. They are threatening again to remerge. **The main themes and ideas we will emphasize in Med Micro are**:

1. How infectious agents can be beneficial or cause disease, and how our immune system responds. The response can lead to tolerance or to full-fledged biological warfare with countermeasures, counter-counter measures…
2. How the scientific method is used to study host-microbe interactions and how this knowledge can be used to prevent and treat disease. Mastering the scientific method will help you outside microbiology too!

Outcomes – At the end of this class YOU will become more skillful at:

1. knowing how microbes protect us
2. knowing how microbes cause disease
3. knowing how the immune system protects us
4. knowing how the immune system causes disease
5. knowing how microbial disease is diagnosed and treated
6. taking charge of your own learning
7. being confident in tackling new questions and challenges
8. reading and understanding primary literature; understanding the scientific method; knowing how the scientist thinks, problem solves, and performs research to benefit our lives. These skills will help you learn new things to enrich your life, empowering you to solve challenges in your professional and personal lives.
9. researching and communicating to others about science, disease, and health. YOU can be a resource of knowledge for your family and friends in matters of life and death.

This is an active learning class that requires active participation and critical thinking skills and de-emphasizes memorization. *All exams and assignments are open book and notes.* It will require you change the way you think about science and learning. A lot of the knowledge we learn in class will be obsolete in a few years—critical thinking never will be. Memorization is a skill that got you this far. It will not get you much further. Waiting to the last minute to study for an exam may have worked before.

It works poorly here, because the critical thinking skills that you need to succeed have to be developed over time; they cannot be crammed. Today is a new day!

Required materials

Textbook: *Schaechter's Mechanism of Microbial Disease, 5th Edition*. Note: the final exam is open book but closed computer, so **possession of a hard copy of the book is needed**. Copies have been placed on reserved in the Biomedical Library. We encourage you to delve deeper as your time, curiosity, and necessity permits. UCSD has many other textbooks on-line that you can access; there will be links on the class web site. If you find something confusing in *Schaechter*'s, you can turn to another resource, such as *Sherris Medical Microbiology, 5th Edition*, available free via UCSD (use a VPN on your personal computer for access). http://www.accessmedicine.com/resourceTOC.aspx?resourceID=656

Clickers (basic iClicker is fine). **Required for this class**. Register your clicker under "tools" on the TED BIMM 124 website. DO NOT REGISTER ON THE ICLICKER WEB SITE. We cannot look up rubbed-out clicker numbers for you. If you cannot read the clicker number on your clicker, you can either retrieve it from iclicker website (if you've registered it there before) or buy another one.

A computer and printer is needed for downloading assignments, relevant on-line chapters, etc… You will need to print out all assigned papers and bring them with you to class, and to your exams.

How we will achieve the aims of this class:

1. **Readings (textbooks and primary literature)**: Mandatory *before* each class.

Textbook: Your textbook provides foundational information for class, *e.g.* information about the immune system, disease symptoms, mechanisms of pathogenesis and protection. Textbook readings lay the foundation for our classroom interactions. Prior reading of the textbook material **before** lecture **is required** in this class and will serve as the starting point for our discussions. Unlike many other classes you have taken, we will not focus on explaining what was in the textbook readings. Rather they will serve as a starting point for fascinating joint discussions in class, delving into much more interesting and applied topics. Remember, the exams are open book. You do not have to read to memorize, you only need to read to comprehend and get a good background for class. Although you do not have to memorize, you still have to know what is in the readings in order to access the information for exams… "Read before to soar." This is an opportunity to take charge of your own success. *We recommend that you do all your readings in groups.*

Primary literature: The second of two lectures for each pathogen will focus on primary literature relevant to that pathogen (*e.g.* how it causes disease, interactions with the immune system). Virtually everything we know about immunology and microbial pathogenesis is based on published research. This takes you right to the "fountain of scientific knowledge." Further, by delving into primary literature, your critical thinking skills will grow like on steroids. This is one of the most important skills we can teach you—a skill you can apply long after UCSD in professions such as medicine, research, pharmacy, industry, law, journalism, politics, economics... It will enrich your life in many ways.

Each week, you will have 1-2 papers to prepare and discuss in class and sections. As with textbook readings, these must be done **before** lecture. This preparation is essential for the paper to make sense and for you to learn how to read, think about, and work with research literature. Knowing how to do this affects a significant part of your grade, since you will use these tools for your "Final Paper" and on the exams. We want to give you ample opportunity to practice to succeed. "Read before to soar." This is an opportunity to take charge of your own success. *We urge you emphatically to do all your readings in groups.*

WHY DO WE REQUIRE READINGS BEFOREHAND? AND WHY WILL WE NOT SIMPLY BE LECTURING FROM THE READINGS AS IN MANY OTHER CLASSES? We assume you are here to learn. Learning requires effort. If the lecture simply rehashes the readings, we will be spoon-feeding you the learning, robbing you of the valuable opportunity to improve your learning and critical thinking skills. Did you know that focusing on higher level learning skills results in brain development? Research shows this! This class is a weight-lifting class for your brain. We can't do the exercising for you. If you do it, your thinking muscles will grow and so will your success in life. Our goal is your success.

2. **Quizzes**. Each class will begin with a 3-question multiple choice clicker quiz. The goal of this quiz is to give you added incentive to do the reading ahead of time. The class quiz will be strictly on basic understanding of the readings. Our expectation is that >80% of the class will get the answers right provided they have done the readings. The slides with these questions will be framed by an **orange** box. See below for grading.

3. **Interactive lectures with clickers**. These form the "meat" of each class. We will pick a few topics from the readings and write multiple-choice questions that require deeper thinking/cognitive analyses. Many of these you may not get right the first time around. You will get to click in and vote on an answer. Then, you will work in assigned groups to discuss the question for a few minutes, followed by a second opportunity to click in with each group selecting one best answer. From here, we will have in-class discussions as to what the right answer is and what's behind it. The goal of these sessions is actively engage and empower you in YOUR learning process. Our goal is to help you develop your mind and thinking capabilities so that you can succeed in a rewarding life. Our goal is your success. The slides with these questions will be framed by a **green** box. See grading below.

   Note for clicker assignments: Our primary impetus for using clickers is not to force attendance. Rather, our goal is to promote participation in class, to promote reading ahead of time, and to promote your success and learning.

4. **Sections**. Sections are mandatory and play a significant role in reinforcing and strengthening your analytical skills. Sections are where your Section Papers are discussed and graded. You must be present to receive a grade on your Section Papers, which can help your course grade. Section papers are excellent practice for classroom discussions, for your exams, and for your Final Paper … another opportunity to take charge of your success. Sections that do not cover Section Papers are focused on answering questions from the readings and lecture that require further clarification.

   You will sign up for a discussion section starting Friday, Oct 3 at 5 PM, on the web site sections.ucsd.edu

How you will be evaluated

1. **Clickers**, **10%** of your grade:
   a. **Orange box quiz questions** = 5% of your grade. Get 75% of these questions correct to get full credit for the quarter. Get 50% of these questions correct to get half credit for the quarter. These are the only possibilities.
   b. **Green box questions** = 5% of your grade. It does not matter whether you get these right or wrong. Participating in 75% of these questions during 75% of the lectures gives you full credit for the quarter. No partial credit.

2. **Section Papers**, **optionally 10%** of your grade: There are three optional write-ups on primary literature due in Section. These will be written up according to instructions given with each paper and are to be no longer than 1 page in length. You can work on reading and discussing these assignments in groups and then write up your own answers individually. You are to bring your write-ups to section, where they will be discussed and graded. You must be present in section to get credit for your Section Paper.

   For each Section Paper, you may receive:
   - "S" (satisfactory) 1 full point
   - "I" (improvement needed) ½ point
   - "N" (no credit) 0 points

   The questions for these papers will mirror those on the exams and Final Paper and are *good low stress practice for both*.

   If your Section Paper total is:
   - ≥2 points, then 10% of your final grade is an A (100%)
   - <2 but ≥1 point, then 5% of your final grade is an A (100%)

   If you earn less than 2 points, the remainder (up to all) of the 10% will transfer to your final exam score.

3. **Exams**. There are two exams in this class:
    - **midterm** on Friday, Nov 7 during lecture
    - **final exam** on Friday, Dec 19 from 8-11 AM

   Both exams are cumulative, *open book, and open notes*. No electronic media (cell phones, computers, calculators, etc…) are allowed. Exams emphasize problem-solving skills and being able to think about and extrapolate information from readings.

   The **midterm** is worth **15%** of your grade, but that 15% will be replaced with your final exam score if you do better on the final (most students do). The midterm is a low pressure opportunity to practice for the final.

   The **final exam** is worth **40-50%** of your grade **depending on whether you get credit for section papers**. Both exams will be graded on a standard scale (not on a curve) so that everyone has the opportunity to achieve a high grade. The scale is established as follows: 100% on final exam will be normalized to the average of the top 15 grades in the class. **NOTE:** There is no re-grading of the exams except for incorrect addition of points.

   We realize you may have many finals. Please look at your finals' week schedule now. If the timing of this final conflicts with other finals, then you need to either drop the conflicting class or this class. Writing a fair exam for this class takes a lot of effort. Therefore we can write only one version of the exam. To be fair to everyone, we regret we can only offer the final at the time scheduled except under extraordinary documented circumstances (*e.g.* documented illness that requires hospitalization), and we must be notified of that extraordinary circumstance *prior* to the final.

4. The **Final Paper** is an analysis of a primary research article, due on **Monday, Dec 8**, and worth **25%** of your grade. The format of this paper and what will be expected from the students will be made explicitly clear when the paper is assigned. *You are to work on this individually*, not in groups, and are expected to do your own thinking and writing. We use Turnitin.com to detect plagiarism, which will be treated as a breach of academic integrity. The Final Paper will be graded according the prompt that will accompany the assignment (similar to your section paper assignments leading up to this). To get full credit you *must* hand in your assignment on time. If you submit it late, there will be several unavoidable consequences. One is, we may not be able to find time to grade it (which would result in a zero), because we have scheduled readers with limited time to grade these. The second is your peers will justly complain that it is unfair you got more time. The third is your peace of mind will probably suffer since you will be piling on your workload before/during finals week. If, for some reason outside your control, you cannot meet this deadline, please email Dr. Gus before the due date. There is are no re-grades of the Final Paper.

Grades

Course grades will be assigned as follows:
A: 85-100%; B: 75-85%; C: 60-75%; D: 45-60%.

Academic Integrity: Academic dishonesty undermines the hard work of all students in the class who are engaged in learning and who take responsibility for their learning. Academic dishonesty is incompatible with science and the search for truth. We do not tolerate it. Out of respect and appreciation for your own efforts, nor should you. We encourage you to talk with any of the BIMM124 staff if you learn of any incidents of academic dishonesty. If we suspect dishonesty, we will meet with you to discuss the concern and will report the incident to the Office of Academic Integrity, who will contact your college dean. Academic dishonesty includes:

- clicking in for another student
- copying another student's paper or from any other source
- cheating on an exam

The following is an excerpt from the UCSD Academic Dishonesty policy: *"Each student is responsible for knowing and abiding by UCSD's policies on Academic Dishonesty and on Student Conduct. Any student violating UCSD's Academic Dishonesty or UCSD's Student Conduct policies will earn an 'F' in the course and will be reported to their college Dean for administrative processing. Committing acts that violate Student Conduct policies that result in course disruption are cause for suspension or dismissal from UCSD."* Use of two or more clickers in the class (*i.e.* clicking in for someone else) will be treated as a violation Student Conduct Policies.

How to succeed in Med Micro:

1. Spend the 8-10 hours/week outside of class expected for a four-unit course.
2. Come prepared, having done the assigned readings prior to the lecture. "Read before to soar." Students who do the work and come prepared to class do better. Period.
3. Participate in lectures and sections. We have run the statistics. Students that participate in class and in section statistically do better than those that do not.
4. Ask questions whenever something in not clear, before/during/after class, during our office hours (please come!), during TA office hours, and in sections.
5. Click in and do all the assignments, including Section Papers. Whether you get "S" or not, you will learn a lot in the process.
6. Talk with the instructors and/or your TA's about any challenges you are having with assignments, with understanding the material, with reading primary literature, with problem solving techniques. We know this is not easy. Let us know as soon as you are able how we can help you learn.
7. **Study in groups**. Read the textbook in groups. Read the papers in groups. Reading primary literature by yourself is challenging to say the least. It is better in groups. Be a groupie. You learn more from your peers than from instructors. To help, we set up groups in section.
8. Class etiquette: Come on time. If you come late, please sit in the back so as to not disturb others. Be present. That means cell phones off and focus your computer work on class. Texting, surfing, etc… is disruptive to other students.

Sections	Monday lecture	Wednesday lecture	Friday lecture
			Oct 3 Intro and course logistics
Set up groups; Review	Oct 6 Innate Immunity Chpt 6	Oct 8 Innate Immunity Brinkmann 2004	Oct 10 Adaptive Immunity Chpt 7
Section paper #1	Oct 13 Adaptive Immunity Chpt 7	Oct 15 Damage Response Casadevall & Pirofski '03	Oct 17 Microbiota Chpt 2
Reveiw	Oct 20 Host-pathogen interaction in gut – Janelle Ayres paper TBA	Bacteria intro Oct 22 pp 18 to top of 26 (before "Cytoplasmic membrane") and pp 29 ("Capsules, Flagella…) & 31	Oct 24 Mycobacteria Chpt 23
Section paper #2	Oct 27 Secretory diarrhea Chpt 16	Oct 29 Secretory diarrhea Roy 2011	Oct 31 Staphylococcus Chpt 11
Review; Exam prep	Nov 3 Staphylococcus Inoshima 2011	Nov 5 Film: Hunting the Nightmare Bacteria (PBS – Frontline)	Nov 7 MIDTERM
Review	Nov 10 Chlamydia Chpt 27	Nov 12 Chlamydia Nelson 2005	Nov 14 Intestinal helminths Chpt 54
Section paper #3	Nov 17 Intestinal helminths paper TBA	Nov 19 Virus intro Chpt 31	Nov 21 Ebola reading TBA
Review	Nov 24 Ebola paper TBA	Nov 26 HIV Chpt 38	Nov 28 HOLIDAY
Review; Exam prep	Dec 1 HIV Hatziioannou 2009	Dec 3 Influenza Chpt 36	Dec 5 Influenza paper TBA
Review; Exam prep	Dec 8 Host proteins for HIV/Flu infection Sumit Chandra FINAL PAPER DUE IN CLASS!!!	Dec 10 GI protozoa Chpt 53 Sharon Reed	Dec 12 Vaccines Chpt 45
	Dec 15	Dec 17	Dec 19 FINAL EXAM 8 AM