

BIMM 132 GS - Microbial Diversity and Evolution

Global Seminars edition

Course Syllabus*

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Course description: The course provides an introduction to the structural and physiological characteristics, molecular genetics, genomics, and ecology of microorganisms of the Galapagos Islands, the highlands, and the Amazon rainforest in Ecuador, with emphasis on the genetic and metabolic diversity of bacteria, archaea, and fungi and their interactions with hosts and the environment. Students must apply and be accepted to the Global Seminar Program in order to enroll. Program or materials fees may apply. **Prerequisites:** BILD 1 or equivalent.

Learning goals: At the end of the course students will be able to appreciate microbial diversity, understand microbial genetics, microbial metabolism, microbial evolution, how microbes regulate gene expression, and interact with the environment, with a particular emphasis on the microbial biodiversity of Ecuador. Through excursions and hands-on activities, students will also learn and participate in some of the conservation programs of the Galapagos Islands and mainland Ecuador.

Course preparation: To do well in BIMM 132, students should have a background in general biology and organic chemistry. It is assumed that students know basic biochemistry (the major types of molecules found in cells, cell metabolism), as well as basic (introductory) cell biology and the importance of scientific method and experimental design. Although this is not a lab course, and no lab skills are required, it is expected that students know how a general biology research lab functions and how the scientific method is applied to research. Students should review this material before the start of the course.

Textbook: “Microbiology, an evolving science”, 5th or 6th editions, by Foster & Slonczewski is highly recommended, but not required. I will have a copy of this textbook on site for you to consult.

Another textbook you may consider: Todar’s Online textbook of Bacteriology
- http://www.textbookofbacteriology.net/kt_toc.html

Final grade: Your final grade will be determined by the following assignments:

- 10% will be based on team work (20 points)
- 20% will be based on 1 writing assignment (40 points)
- 20% will be based on lab/field journal completion (40 points)
- 50% will be based on the final presentation (100 points)

Total points available: 200 points (100%)

Writing assignments: Students enrolled in the course will complete one writing assignment via the course website in Canvas (more information will be provided later). The writing assignment represents an excellent opportunity to practice scientific writing skills, learning how to write and formulate hypotheses, summarize results, discuss and provide reasoning for claims. Detailed guidelines will be provided.

Deadlines for all of the assignments for this class are in Pacific Daylight Time.

All assignments submitted after the deadline will receive a penalty.

Lab and Field journal:

Complete and organized lab journal entries are a critical part of effective work in a research lab. As such, we expect students to practice good journal entry habits. Information on how to keep a complete and organized lab journal will be provided during the first week.

Oral Presentations

Presenting ideas and results in an oral format to an audience of peers is a valuable skill to have. In the course, students will be responsible for providing one oral team presentation during the last week of the course.

Regrade Requests: All regrade requests should be submitted in writing (by email to Dr. Pirino) *within 5 days* of receiving the graded material (aka, the day that scores are posted in Canvas) with an *explanation of why their assignment requires a regrade*. More details will be provided.

Scientific articles: We will read several articles throughout the course. These articles will provide more background information to the excursions and activities that we will do during the course. As you read the scientific papers, focus on the big picture and look for the following points:

1. What were the main goals this paper? What was the research question of the study? What was/were the hypothesis/es?
2. What experiments were performed to test the hypothesis/es?
3. Did the results confirm or refute the hypothesis/es?
4. What do the figures/table communicate?
5. What were the main conclusions of the paper?

If there is something that you do not understand, skip it temporarily, you can return to it later.

Useful resource (video): [How to read a scientific article](#)

VPN at UCSD (Virtual Private Network): please set up your VPN access before week 1 to access articles or other materials from UCSD while abroad: [UCSD VPN](#)

Statement on Office for Students with Disabilities (OSD): To receive accommodation, students must present or email their “Authorization for Accommodation” (AFA) form provided by the Office for Students with Disabilities (OSD) to the instructor.

Discrimination and Harassment: The University of California, in accordance with applicable federal and state laws and university policies, does not discriminate on the basis of race, color, national origin, religion, sex, gender, gender identity, gender expression, pregnancy (including pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), physical or mental disability, medical condition, genetic information, ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services (including membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services). The University also prohibits harassment based on these protected categories, including sexual harassment, as well as sexual assault, domestic violence, dating violence, and stalking. The nondiscrimination policy covers admission, access, and treatment in university programs and activities.

If students have questions about student-related nondiscrimination policies or concerns about possible discrimination or harassment, they should contact the Office for the Prevention of Harassment & Discrimination (OPHD) at (858) 534-8298, <https://ophd.ucsd.edu/> , or <http://ophd.ucsd.edu/report-bias/index.html>

Campus policies provide for a prompt and effective response to student complaints. This response may include alternative resolution procedures or formal investigation. Students will be informed about complaint resolution options. A student who chooses not to report may still contact CARE at the Sexual Assault Resource Center for more information, emotional support, individual and group counseling, and/or assistance with obtaining a medical exam. For off-campus support services, a student may contact the Center for Community Solutions. Other confidential resources on campus include Counseling and Psychological Services, Office of the Ombuds, and Student Health Services.

CARE at the Sexual Assault Resource Center: 858.534.5793 | sarc@ucsd.edu | <https://care.ucsd.edu>

Counseling and Psychological Services (CAPS): 858.534.3755 | <https://caps.ucsd.edu>

Statement on Academic Integrity: Integrity of scholarship is essential for an academic community. The University expects that both faculty and students will honor this principle and in so doing protect the validity of University intellectual work. For students, this means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind. The consequences of being caught cheating can be severe. Information can be found here: <http://www.ucsd.edu/current-students/academics/academic-integrity/index.html>

Students are expected to do their own work, as outlined in the UCSD Policy on Integrity of Scholarship: <http://senate.ucsd.edu/Operating-Procedures/Senate-Manual/Appendices/2>

Academic misconduct will NOT be tolerated. At discretion of the instructor, students suspected of Academic Integrity (AI) violations on any assignment may be invited to follow-up meetings where they will be asked to justify their answers, or reported directly for AI violations. Cheaters will receive a failing grade on the assignment, and/or in the course. They may also be suspended from UCSD pursuant to University guidelines.

All class material, such as syllabus, readings, homework, lecture slides, etc. are copyrighted and **cannot** be posted to websites and/or shared without instructor's approval for any reason.

Students that sell and share course materials not only violates the student code of conduct, but also violates UC's 2005 policy on the Use of Recordings of Course Presentations: <http://copyright.universityofcalifornia.edu/resources/recorded-presentations.html> .

Academic misconduct includes but is not limited to:

1. **Cheating**, such as using "crib notes", copying answers from another student, or forge assignments.

2. **Plagiarism**, such as using the writings or ideas of another person, either in whole or in part, without proper attribution to the author or the source. Copying anything from any source is plagiarism if the source is not clearly cited. Plagiarism is stealing someone else's ideas and presenting them as your own.
3. **Collusion**, such as engaging in unauthorized collaboration on exams or assignments, completing for another student any part or the whole of an exam or assignment, or procuring, providing or accepting materials that contain questions or answers to an exam or any assignment to be given at a subsequent time.

*tentative.

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Tentative Schedule

WEEK- CLASS/ LECTUR ES	Lecture Topic	Assignments/Things to do	Location/Excursions
Week 1-1	Introduction to the course & Logistics		Santa Cruz, Galapagos
Week 1-2	Microbial Cell Structures & Functions	Field journal	Santa Cruz, Galapagos
Week 2-3	Microbial Genetics	Field journal;	Santa Cruz, Galapagos
Week2- 4	Microbial gene regulation	Field notebook; Writing Assignment 1 due	San Cristobal, Galapagos
Week3- 5	Microbial gene regulation & Metabolism	Lab journal	San Cristobal, Galapagos
Week 3-6	Microbial Evolution	Writing Assignment 1 revision	Leon-Reyes lab tour & guest lecture, Quito
Week 4-7	Microbial Evolution & Phylogeny	Field notebook	Tiputini, Amazon rainforest
Week 4-8	Human microbiome	Field notebook; Writing Assignment 1 due	Tiputini, Amazon rainforest
Week 5-9	Nitrogen cycle & nitrogen fixers	Field notebook	Andes Highlands, Sierra
Week 5-10	Work on presentations	Oral presentations	