Department of Biological Sciences

BIO 145: Diversity of Microorganisms

Spring 2015 Syllabus

Part 1: Course Information

Instructor Information

Instructor: Enid T. Gonzalez-Orta, Ph.D.

Office: 211F Humboldt Hall

Office Hours: 4:30-5:30 PM M/W or by appointment

Office Telephone: (916) 278-6438

E-mail: gonzalezorta@csus.edu; for all class-related questions, please use the Message function on SacCT for all communication. NOTE: E-mails received Saturdays past noon will not be answered until Monday.

Course Description

Isolation, cultivation and characterization of a wide variety of soil and water microbes from natural habitats using the elective enrichment technique; natural habitats also will be examined directly for the numbers and varieties of microbes which are present. Lecture two hours; laboratory three hours. Fee course

Prerequisite

- BIO 139: General Microbiology.

Textbook & Course Materials

Required Text & Materials

- Brock Biology of Microorganisms, Madigan, 14th Edition. ISBN: 978-0-321-89739-8
- Phylogenetic Trees Made Easy-A How-To Manual, 4th Edition. ISBN: 978-0-87893-606-9
- Electronic Lab Notebook Access from Lab Archives (http://www.labarchives.com/). You will receive an invite from me the first week of class. This costs $10 for the semester.

Recommended Texts & Software

- Other readings will be made available in the SacCT environment
- Links to *free* software used in this class will be provided on SacCT. These include FinchTVI and MEGA 5. Weblinks to online databases like the GenBank and the Ribosomal Database Project will be provided as well. All software will work on either a Mac or PC operating system.

Course Requirements

- Internet connection (DSL, LAN, or cable connection desirable)
- Access to SacCT
- Laboratory coat
- Safety glasses/goggles
- Sharpies/permanent markers & ball point pens.
- 3-Blue/Green books for quizzes
- Laptop computer (optional)
- Digital/cell phone camera (optional)

Course Structure

Class discussions will be delivered as a combination of interactive in-class exercises and traditional lecture methods. Outlines/Slides/Handouts will be available to students through SacCT, if used.

Online Resources

All course materials presented during discussion will be provided on SacCT. This includes the syllabus, PowerPoint/Prezi slides, and handouts. Students are responsible for checking if any handouts will be needed for the following class period.

BIO 145: Diversity of Microorganisms

Spring 2015 Syllabus

Part 2: Course Objectives

Discussion Objective and Assessments: The discussion portion of this course serves as a forum for students to obtain foundational information regarding the class project. As a class, we will discuss relevant book chapters, techniques, and research articles pertaining to our investigation of rhizosphere, soil, and/or water communities. Assessments will include three quizzes, 6-8 paper summaries, leading a paper discussion, and a final research paper.

Laboratory Objective and Assessments: You will be working as a team to characterize the bacterial community of a select location on the Sacramento State campus or American River. A schedule of experiments can be found on SacCT. This will serve as a more detailed guide for your investigations. Some of the experiments will take shorter or longer, depending on how prepared/organized you are to start the lab experiments for that day. Please be flexible and prepared for the day's activities.

As this is a true research project, all students will keep an Electronic Laboratory Notebook (ELN). Students are responsible for taking pictures of relevant Petri plates, slides, etc. There will be several notebook checks throughout the semester. A guide on how to keep an ELN, formatting guidelines, etc. will be available on SacCT.

During the 8th week of the semester, you will have the opportunity to present your progress to the greater group during our "Lab Meeting" Week. During this presentation, students will have an opportunity to report their successes and difficulties. In addition, students will have an opportunity to propose additional experiments to repeat or conduct based on their data. Guidelines for the Lab Meeting presentation and proposal for additional experiments will be posted on SacCT.

The collective of your research efforts will be presented as a 1) paper and 2) poster presentation. Each individual student will hand in their own paper (part of your discussion grade) and each group will hand in a collective poster. Details for the paper and the poster will be posted on SacCT. You will be responsible for printing out a group poster. The Student Tech Center at the AIRC will print one for you, if it is a class assignment. Please follow this link for further information: http://www.csus.edu/irt/stc/printing.html

In summary, this course is designed for students to have a meaningful research experience. By the end of the semester students will be able to form and test hypotheses, interpret data, and contribute to a greater body of microbial ecology knowledge.

BIO 145: Diversity of Microorganisms

Spring 2014 Syllabus—Discussion Outline

Date	Topics	Associated Reading
1/26	Class Introduction, Introduction to Microbial Ecology, and "The Experiment"	
1/28	Introduction to Microbial Ecology and Introduction to Methods Used in Microbial Ecology	B: 19.1,
2/2	Methods in Microbial Ecology-PCR and rRNA Sequencing	B: 18.5
2/4	Methods in Microbial Ecology-Bioinformatics Primer	On SacCT
2/9	Culture-Dependent Methods in Microbial Ecology	B: 18.1 and 18.2
2/11	Paper Discussion #1-*Tanaka et al.*	Mendeley Library
2/16	Environmental Considerations and their effect on Microbial Ecology	B:19.3, 19.4
2/18	**Quiz! Bring Blue Book**	
2/23	Paper Discussion #2-*Lauber et al*	Mendeley Library
2/25	Analysis of Microbial Diversity	On SacCT
3/2	Paper Discussion #3-Hughes et al.	Mendeley Library
3/4	Microbial Ecology of Aquatic Systems	B: 19.8
3/9	Paper Discussion #4-*Zwart et al.*	Mendeley Library
3/11	Culture Independent Methods to Study Microbial Ecology	B: 18.3, 18.4
3/16	**Lab Meeting Presentations**	
3/18	**Lab Meeting Presentations**	
3/23-3/25	**Spring Break**	**No Class**
3/30	**Quiz! Bring Blue Book**	
4/1	Culture Independent Methods to Study Microbial Ecology	B: 18.7
4/6	Paper Discussion #5-TBD	Mendeley Library
4/8	Metabolic Diversity and Antibiotic Discovery	B: 27.12, 27.14, On SacCT
4/13	Paper Discussion #6-Ling *et al*	Mendeley Library
4/15	Phylogenetic Tree Building and Methods of Evolutionary Analysis	B:12.8, 12.9, 12.10
4/20	Paper Discussion #7-TBD	Mendeley Library
4/22	**Quiz! Bring Blue Book**	
4/27	Depicting Phylogenetic Relationships with Phylogenetic Trees	On SacCT
4/29	Paper Discussion #8-TBD	Mendeley Library
5/4	Group work for final paper and posters	
5/6	Group work for final paper and posters	
5/11	**Hand in Final Poster** and work on final Paper Revisions	
5/13	**Final Poster Presentation—10-noon**	Room TBA

Part 4: Grading Policy

Discussion Assessment Schedule

Assessment/Assignment	Points	Date
Quiz 1	20	2/18
Quiz 2	20	3/30
Quiz 3	20	4/22
Facilitating Discussion of Scientific Literature	50	TBA
Final Research Paper	100	5/13
Research Paper Summaries & Participation	50	ongoing
Total Points	**260**	

Laboratory Assessment Schedule

Assessment/Assignment	Points	Date
Weekly Progress Reports/Paper Sections	5-10 pts each/ will vary-60 pts total.	Ongoing-Weekly
Lab Notebook Checks	5 checks @10 pts each (some announced; some unannounced)-50 pts.	Ongoing
Lab Meeting Presentation	50	3/16
Final Poster	50	5/11
Preparation for Lab Experiments/Attendance	30	Ongoing
Total Points	**240**	

Late Work Policy

Be sure to pay close attention to deadlines—there will be no make up assignments or quizzes, or late work accepted without a serious and compelling reason and instructor approval.

Letter Grade Assignment

Final grades assigned for this course will be based on the percentage of total points earned (60% from Lab and 40% from discussion) and are assigned as follows:

Letter Grade	Percentage	Performance
A	93-100%	Excellent Work
A-	90-92%	Nearly Excellent Work
B+	87-89%	Very Good Work
B	83-86%	Good Work
B-	80-82%	Mostly Good Work
C+	77-79%	Above Average Work
C	73-76%	Average Work
C-	70-72%	Mostly Average Work
D+	67-69%	Below Average Work
D	60-66%	Poor Work
F	0-59%	Failing Work

Important note: For more information about grading at Sac State, visit the academic policies and grading section of the university catalog.

BIO 145: Diversity of Microorganisms

Spring 2014 Syllabus

Part 5: Course Policies

Attend Class

Students are expected to attend all class sessions as listed on the course calendar. You will be allowed one unexcused absence for discussion/lab. All other absences must be reported to the instructor.

- Attendance/Late Policy: Attendance is taken at the beginning of each class period for both discussion and lab. If you must arrive late, please do so as QUIETLY as possible as to not disturb the instructor or your classmates. If you must arrive late routinely due to scheduling, please tell instructor within the first two weeks of the semester for an accommodation. Persons who arrive more than a half-hour late for lab will be marked absent for that lab period. More than one unexcused absence will result in point deductions from the participation portion of your grade for this course.

- This course is dependent on collaborative work. Missing a class here or there will add up in the end and will affect the quality of your final project. Therefore, missing a class is not advisable.

- There are no make-up lab opportunities for this class. The laboratory space is seldom available for open labs. Therefore, use your time wisely when you are in class.

Participate

Your class participation is essential in a collaborative learning and work environment. Therefore you will be evaluated on this each day. This includes speaking up in class, taking part in small group discussions, and daily work preparation.

Build Rapport

If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. As you will find, building rapport and effective relationships are key to becoming an effective professional. Make sure that you are proactive in informing your instructor when difficulties arise during the semester so that they can help you find a solution.

Complete Assignments

All assignments for this course will be submitted electronically through SacCT unless otherwise instructed. Some assignments will be given as worksheets and other will be online. Assignments must be submitted by the given deadline or special permission must be requested from instructor *before the due date*. Extensions will not be given beyond the next assignment except under extreme circumstances.

All discussion assignments must be completed by the assignment due date and time. Late or missing discussion assignments will effect the student's grade.

Make-up Exam Policy

If you MUST miss a discussion/lab exam due to illness, please call or E-mail the instructor before 9 AM on the day of the exam. Make up exams will be given at the discretion of the instructor.

Discussion/Laboratory Conduct & Etiquette

1. Limit discussion of non-class related topics during the laboratory. There is a lot of work to do and very limited time. This does not allow any time to be lost due to extra conversation. Please, no talking while instructor is lecturing or giving instructions.

2. Instructions on the care of all laboratory equipment (i.e., microscopes, loops, etc.) must be followed at all times. Failure to do so will results from point deductions from your final laboratory grade to be determined by your instructor. Only one warning will be made prior to the point deduction.

3. Laboratory safety guidelines will be provided for you and will be posted on SacCT for your reference. Laboratory safety guidelines are to be followed at all times. Failure to adhere to safety guidelines will result in point deductions to your final grade as determined by your instructors. In severe circumstances, the instructor may assign a grade of F for the course.

4. All students are responsible for familiarizing themselves with the Sacramento State Student Code of Conduct: http://www.csus.edu/umanual/student/UMS16150.htm

Understand When You May Drop This Course

It is the student's responsibility to understand when they need to consider disenrolling from a course. Refer to the Sac State Course Schedule for dates and deadlines for registration. After this period, a serious and compelling reason is required to drop from the course. Serious and compelling reasons includes: (1) documented and significant change in work hours, leaving student unable to attend class, or (2) documented and severe physical/mental illness/injury to the student or student's family.

Incomplete Policy

Under emergency/special circumstances, students may petition for an incomplete grade. All incomplete course assignments must be completed within one academic year.

Inform Your Instructor of Any Accommodations Needed

If you have a documented disability and verification from the Office of Services to Students with Disabilities (SSWD), and wish to discuss academic accommodations, please contact your instructor as soon as possible. It is the student's responsibility to provide documentation of disability to SSWD and meet with a SSWD counselor to request special accommodation *before* classes start.

SSWD is located in Lassen Hall 1008 and can be contacted by phone at (916) 278-6955 (Voice) (916) 278-7239 (TDD only) or via email at sswd@csus.edu.

Commit to Integrity

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and also integrity in your behavior in and out of the classroom. Cheating in this course will result in a failing grade (F) and will be reported to the Chair of the Department of Biological Sciences and the Student Conduct Official on campus.

Sac State's Academic Honesty Policy & Procedures

"The principles of truth and honesty are recognized as fundamental to a community of scholars and teachers. California State University, Sacramento expects that both faculty and students will honor these principles, and in so doing, will protect the integrity of academic work and student grades."

Read more about Sac State's Academic Honesty Policy & Procedures

Definitions

At Sac State, "**cheating** is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means."

"Plagiarism is a form of cheating. At Sac State, "plagiarism is the use of distinctive ideas or works belonging to another person without providing adequate acknowledgement of that person's contribution."

Source: Sacramento State University Library

The use of Turnitin for Paper Assignments as per Center for Teaching and Learning Guidelines.

Consistent with Sacramento State's efforts to enhance student learning, foster honesty, and maintain integrity in our academic processes, instructors may use a tool called Turnitin to compare a student's work with multiple sources. The tool compares each student's work with an extensive database of prior publications and papers, providing links to possible matches and a 'similarity score'. The tool does not determine whether plagiarism has occurred or not. Instead, the instructor must make a complete assessment and judge the originality of the student's work. All submissions to this course may be checked using this tool.

Students should submit papers to Turnitin assignments without identifying information included in the paper (e.g. name or student number), the system will automatically show this info to faculty in your course when viewing the submission, but the information will not be retained by Turnitin.

Important Note: Any form of academic dishonesty, including cheating and plagiarism, may be reported to the office of student affairs.

Course policies are subject to change. It is the student's responsibility to check SacCT for corrections or updates to the syllabus. Any changes will be posted in SacCT.