Lecture / Lab TR 2:00 - 4:50, Holt 337
Dr. Gordon Wolfe Holt 343, 898-4256, gwolfe2@csuchico.edu
Office hours: T, R, F 12-1:30, or by appointment

Overview: This class examines microbiology from their function and interactions in the natural environment. Major ecological themes include evolution, diversity, adaptation, cooperation, and environmental impact. Labs teach techniques to collect, observe, enumerate, and identify groups of microbes, and to evaluate their interactions and their impact on the environment. There will be two field trips: **a weekend trip** to Lassen Volcanic National Park, and a class period trip to the Chico sewage plant.

Learning Outcomes: At the conclusion of this course, students should be able to:
1. be able to describe and differentiate aquatic and physical environments;
2. demonstrate knowledge of microbial metabolism and its environmental impacts;
3. demonstrate knowledge of community interactions: mutualisms and competition;
4. demonstrate ability to manipulate microbes in the field and laboratory, including enumerating cells and biomass, molecular analyses, and estimation of community rates;
5. read and analyze scientific papers.
6. synthesize information and present it orally

Prerequisites: Lower-division biology and chemistry, as basic algebra. BIOL 321 (Major's Microbiology) is strongly recommended.

There is a $38 course fee, due at registration, which will be used to partially cover travel expenses for **required** field trips, and for molecular analyses.

Assignments / Grading: 600 points total

Grading: A=90-100%; B=80-90%; C=70-80%; D=60-70%. **No extra credit.** Labs will be done in groups. **Attendance of lab is mandatory**. More than 4 absences without instructor's permission constitutes **failure of course.**

Required Texts:
1. Wolfe lecture notes (online)
2. Dyer, B. 2003. A Field Guide to Bacteria.
3. Wolfe, G. 2008. Microbial Ecology Lab Manual. $20. Sold by the ASM club the first week of class.
4. Lab notebook (BMU Bookstore)

	points
Exams: 300 points	
Midterm 1	100
Midterm 2	100
FINAL (Midterm 3)	100
Laboratory: 300 points	
Organism Paper	50
Proposal Paper	50
Presentation	50
Paper analyses	50
Lab Writeup	100

Dr. Wolfe also has a large number of texts for additional information.

Tentative course schedule – check course WebCT syllabus frequently for updates!

Week	Date		Topics	Labs / Assignments
1	Aug.	25	Course objectives; Introduction	*Labs 1-3: qualitative ecology*
			Microbial view of ecology	
		27	Habitats: aquatic	
Aug. 29/30: field trip to Lassen Volcanic National Park				
2	Sept.	1	Habitats: terrestrial	*Labs 3-7: quantitative ecology*
		3	Metabolic diversity I	
3		*8*	*UNIVERSITY FURLOUGH DAY*	
		10	Metabolic diversity II	
Sep. 12/13: field trip to Lassen Volcanic National Park				
4		15	Organismal diversity I: prokaryotes	Paper #1 assigned
		17	Organismal diversity II: prokaryotes	
5		22	Organismal diversity III: eukaryotes	
		24	**Midterm I: through 9-17**	
6		29	Molecular ecology I	*Labs 8-13: molecular ecology*
	Oct.	1	Molecular ecology II	
7		6	Population interactions	
		8	Microbial communities	
8		13	Physiological ecology & growth	**Paper #1 DUE**
		15	*UNIVERSITY FURLOUGH DAY*	
9		20	Trophic roles, chains, and webs	
		22	Plant- & Animal-microbe associations	
10		27	Measuring rates & processes	*Labs 14-15: community ecology*
		29	**Midterm II: through 10-22**	
11	Nov.	3	Biogeochemical cycles: C, N, S	
		5	Biogeochemical cycles: P, metals	*Group projects*
			Acid mine drainage, bioleaching	
12		10	Geomicrobiology	Paper #2 assigned
		12	Gaia & Astrobiology	
13		17	Sewage treatment, bioremediation	Field trip to water plant
		19	Disease ecology; human microbiome	
Nov. 24, 26: Thanksgiving break				
14	Dec.	1	presentations I	
		3	presentations II	
15		8	presentations III	
		10	presentations IV	**Paper #2, Lab writeup DUE**
16		17	**Midterm III 12 – 1:50**	