
SIO128
Microbial Life in Extreme Environments
Prerequisites: BILD1-3

This course will highlight the weird and wonderful things microbes do to influence our lives and the characteristics of Earth. It is hoped that by highlighting the strangest of the strange that students will acquire a lifelong sense of fascination and wonder with the nature and diversity of the largely invisible microbial life forms present throughout the biosphere. Examples will include cloud formation, mineral precipitations, bacteria with rocket fuel in their membranes, giant microbes in fish guts, the viruses of viruses, radiation resistance in the Atacama desert, microbes that live off of the effects of radioactive potassium, how microbes that like high pH got into your laundry detergent, and microbial survival for millions of years in amber, brine inclusions and deep subsurface sediments.

Date	Subject	Student Presentation
Monday, March 30	Introduction to the class	
Wednesday April 1	Thermophiles I	
Friday, April 3	Thermophiles II	
Monday, April 6	Psychrophiles, Quiz 1	
Wednesday April 8	Halophiles	
Friday, April 10	Methanotrophs	
Monday, April 13	Acidophiles, Quiz 2	Lusine Z
Wednesday, April 15	Alkaliphiles	Jonathon W
Friday, April 17	Oil-eating microbes	Annmarie W
Monday, April 20	Extremophile Biotechnology	Jimmy D
Wednesday, April 22	Low nutrient adaptation	Matthew R
Friday, April 24	Mineral precipitation	Sierra D
Monday April 27	Heavy metal resistance	Matt M
Wednesday, April 29	Midterm Exam	
Friday, May 1	Air/aerosol microbes	Charles A
Monday, May 4	Radiation resistance	Miriam W
Wednesday, May 6	Ancient microbes	Olivia K
Friday, May 8	Piezophiles	Xinyuan Z
Monday, May 11	Giant microbes	Lauren D
Wednesday, May 13	Bacteria with organelles	Shuen S
Friday, May 15	Giant viruses	Garret S
Monday, May 18	Deep subsurface	Taruc A
Wednesday, May 20	Living off radioactivity	Anita L
Friday, May 22	Life in ice	Rashini J
Monday, May 25	Memorial Day Holiday	
Wednesday, May 27	Subglacial lakes	Alexa L

Friday, May 29	Stress responses	Andy G
Monday, June 1	Origin of Life/ Serpentinization	Susie C
Wednesday, June 3	Astrobiology I	Katrina F
Friday, June 5	Astrobiology II	
Finals Week	Final Exam	

Grading:

Attendance – 10 points

Quiz (only the highest scoring quiz will be counted) – 10 points

First Exam – 80 points

Second Exam – 80 points

Student extremophile microbial species presentation – 20 points*

*With regard to the student present; students will select a microbial species belonging to the theme of the class period they have been assigned and present its noteworthy characteristics. Each presentation will be seven minutes in length. It will be divided into an introduction to the general topic of the day, the characteristics of the microbe you have selected that belongs to this extremophile group, the significance of this microbe in terms of taxonomy, adaptation and perhaps biotechnology, along with anything else you feel is pertinent, what you think is left to be studied in this species, and a summary of your presentation. You should have as a last slide a list of at least six references. These cannot be websites but must be peer-reviewed scientific papers. You will mostly be graded on the substance of your presentation, but you will also be graded on the quality of your slides and your ability to answer questions related to your presentation.

Class website: <http://ted.ucsd.edu>

Grading options: Letter or S/U