

MICROBIAL DIVERSITY – PMB C116, Fall 2016

Instructor

Prof. John D. Coates
312G Energy Biosciences Building
e-mail: jdcoates@berkeley.edu
office hours: email for appointment

Graduate Student Instructor

Tuesday Simmons
email: tsimmons@berkeley.edu
office hours: Thursday 11 AM – 12 PM, Koshland 111D or at request

Overview

This course for upper-division undergraduate and graduate students will broadly survey myriad types of microbial organisms, using phylogenetic and metabolic frameworks to organize the concept of "biodiversity." Emphasis will be on the evolutionary development of the many biochemical themes, how they mold our biosphere, and the organisms that affect the global biochemistry.

Meeting Times

Lectures: Tuesday and Thursday 9:30-11am in 103 GPB
Discussion: Tuesday 11am-12pm in 103 GPB
Website: <https://ospace.berkeley.edu/portal>

Organization

Each week, we will have one full lecture on Tuesday and Thursday. Tuesday lectures will be followed by a discussion section focused on the weekly assigned reading, homework exercises, and class presentations by PMB C116 participants. The reading will usually be primary literature relevant to the topic on hand, and will include a small number of questions to be completed and turned in by the beginning of the discussion section. Discussion points will be assigned based on participation in the discussion and completion of the written questions. Midterms will be given in class during the 5th and 9th weeks and students will have the entire class period to complete the exam. The final is comprehensive.

Exams will be graded on a direct percentage scale (no curve) as follows:

98-100%	A+
92-98%	A
90-92%	A-
88-90%	B+
82-88%	B
80-82%	B-
78-80%	C+
72-78%	C
70-72%	C-
68-70%	D+
62-68%	D
60-62%	D-
<60%	F

In general, rubrics for grading homework and exams are very defined (*i.e.*, what constitutes a correct or an incorrect answer). In the event, however, that you feel that an error has been made in grading, please submit to the *Graduate Student Instructor* your assignment/exam plus a clearly written justification as to how/why you believe the error was made.

Point Distribution

Discussion Participation – 10%

Homework – 10%

Midterm 1- 20%

Midterm 2 - 20%

Final- 40%

Required Course Materials

There is no required textbook, however, all reading and lecture handouts will be posted on the course website prior to class. It is your responsibility to print out handouts prior to attending class.

Supporting Information

- Geomicrobiology, 5th ed. Ehrlich, Marcel Dekker Publishers
- Brock Biology of Microorganisms, 14th ed. Madigan, et al, Pearson Prentice Publishers
- The Prokaryotes, 2nd ed., Vol 1-4. Barlows et al., ed., Springer-Verlag Publishers
*Link to electronic version on website under “Course Tools”

MICROBIAL DIVERSITY – PMB 116

Fall 2011

Week	Date	Lecture Topic
<i>Beginnings, Phylogeny, & Energetics</i>		
1	Aug 25	Introduction
2	Aug 30	Early life and Evolution
2	Sep 1	Energetics
3	Sep 6	Metabolism
3	Sep 8	Fermentation
4	Sep 13	Respiration
4	Sep 15	Environmental Energy Flow
5	Sep 20	MIDTERM EXAM I
<i>Life In Extremes & Primary Production</i>		
5	Sep 22	Non-Photosynthetic Primary Production - H ₂ Autotrophy
6	Sep 27	Radiotrophy (H ₂ O hydrolysis)
6	Sep 29	Radiation mediated chemotrophy
7	Oct 4	Astrobiology Guest Lecture - Alfonso Davila
7	Oct 6	Systems biology, Phylogenetics, and Metagenomics
8	Oct 11	Syntrophy
8	Oct 13	Psychrophilic Methanogenesis – coldest known metabolism
9	Oct 18	Thermophilic Methanogenesis –hottest known metabolism
9	Oct 20	MIDTERM EXAM II (Change to Oct 27th)
<i>Interesting Microbial Processes</i>		
10	Oct 25	Anammox
10	Oct 27	Perchlorate Reduction 1
11	Nov 1	Perchlorate Reduction 2
11	Nov 3	Phosphorus Redox Chemistry
12	Nov 8	Humic Substances 1
12	Nov 10	Humic Substances 2

13	Nov 15	Anaerobic Methane Oxidation
13	Nov 17	Anaerobic Methane Oxidation 1
14	Nov 22	Extracellular Electron Transfer
14	Nov 24	NO CLASS - THANKSGIVING
15	Nov 29	Bioelectricity
15	Dec 1	Oil Field Microbiology

Dec 13

FINAL EXAM 3-6 PM

*Syllabus is tentative and subject to change without prior notice.