

Classes start: Mon. August 22

Classes end: Fri. Dec 1

**BISC 419**

Syllabus/ Schedule: Fall 2017

Study days: Sat. - Dec 2-5

Final Exam: Dec 12, 8am-10pm

Kirchman - Processes in Microbial Ecology

			Date	Lecture	Chapters &/or Readings		Laboratory/Discussion Session
Caron	1	T	8/22	Course Overview and Intro	1		
Caron	2	Th	8/24	Lecture moved to Friday (8/25) lab.	2	1	Lecture 2: History & Overview of microbial communities.
Caron	3	T	8/29	Challenges Studying microbial spp. & Environments	3 + Ecosystem Overview Handout		
Caron	4	Th	8/31	Environments, elements, biochemicals & microbes	Paper #1 Pres.: Elser et al 2000	2	Discussion session - Overview of methods that exist. Chap 18 (Brock) (Webb & Caron) Culturing, staining, cloning, sequencing, Flow cytometry, PCR, SSU DNA surveys, FISH
Caron	5	T	9/5	Overview of diversity and ecology of proks & viruses	8 + Reading: Fuhrman&Caron 2016		
Caron	6	Th	9/7	Overview of diversity and ecology of euks	Reading: Caron (2012)	3	Lab: Microbial Ecology Methods (all 3) Basic Culturing methods and DNA stains/microscopy
Caron	7	T	9/12	Diversity of primary producers, their morphologies (proks)	4 + Reading: Paerl&Otten (2013)		
Caron	8	Th	9/14	Diversity of primary producers, their morphologies (euks)	Paper #2 Pres.: Worden et al (2015)	4	The Dirt Field trip (Gerid)
Caron	9	T	9/19	Midterm 1			
Webb	10	Th	9/21	Community structure of microbes in nature (Part I)	9	5	Nucleic acid extraction/purif (Gerid)
Webb	11	T	9/26	Community structure of microbes in nature (Part II)	Paper #3 Pres: Brown, C. T. et al., (2015). Nature		
Webb	12	Th	9/28	The nitrogen cycle	12 + Thompson, A. W. et al., Science 2012	6	Discussion session: Technology for DNA/RNA applications. (Webb) Obtaining sequence, using sequence (uses & present limitations) (bring computers)
Webb	13	T	10/3	The nitrogen cycle	Paper #4 Pres: Van Kessel et al. 2015 Nature		
Webb	14	Th	10/5	Microbial growth, biomass production, and controls	6	7	Lab: Sequence analysis and tree building (Gerid) (Bring computers)
Webb	15	T	10/10	Microbial growth, biomass production, and controls	Paper #5 Pres: Moore et al Nat. Geosci. 2013		
Webb	16	Th	10/12	Genomes & metagenomes: microbes & viruses (Part I)	10 + Venter, J., et al., Science 2014	8	Discussion session/Lab demo - Choosing your method(s) (Webb&Caron) Flow cytometry: FlowCAM: FlowCytobot: ESP: WOM: EcoMapper
Webb	17	T	10/17	Genomes & metagenomes: microbes & viruses (Part II)			
Webb	18	Th	10/19	Midterm 2		9	Lab: What USC microhabitat has the most microbes? Sample Collection, Preservation, Enrichment, etc. (self-guided field trip)
Caron	19	T	10/24	Protistan and Micrometazoan life histories	7		
Caron	20	Th	10/26	Predation, mixotrophy and trophic transfer	Reading: Sherr&Sherr (2002)	10	Lab: What USC microhabitat has the most microbes? Viewing, counting of samples previously collected.
Caron	21	T	10/31	Symbiosis and microbes (relationships involving proks)	14 + Reading: Ley et al (2006)		
	22	Th	11/2	no lecture	5	11	Lab: Aquatic env survey (Gerid). NHM Bring material back to lab
Caron	23	T	11/7	Symbiosis and microbes (relationships involving euks)	Paper #6: Nowak&Melkonian (2010)		
Webb	24	Th	11/9	Processes in anoxic environments	11	12	Aquaonics/soil sequence analysis (Gerid)
Webb	25	T	11/14	Introduction to geomicrobiology	13		
Both	26	Th	11/16	Midterm 3		13	Aquaonics/soil sequence analysis (Gerid, Sarah, Mike demo)
Webb	27	T	11/21	Degradation of organic material			
Webb	28	T	11/28	Open discussion (prok research in environmental micro)		14	Lab: Aquatic environments (continued) community change & succession in river, port, lake, sewage, engineered
Webb	29	Th	11/30	Optional Review			
Both			12/12	Final Exam (cumulative)		15	

3 midterm

2 paper presentations each

Final

100 pts each

20 pts each

150 pts

10 pts partic.

500 total