

SES Microbial Methods

Syllabus 2024

Module	Date	Topic	Instructor
1	Tue (3 Sep)	1: Introduction Lecture only	Vallino
	Thu (5 Sep)	Lab: Construct Winogradsky column. Field trip to Little Sippewisset Marsh. Wear shoes that can get wet and muddy.	
2		2: Bacterial abundance	Vallino
	Tue (10 Sep)	Lab: Prepare dilution and coliform plates. Fix samples for direct DAPI counts	
	Thu (12 Sep)	Lab: DAPI staining and counts Examine plates Problem Set 1 due: Introduction	
3		3: Bacterial production	Vallino
	Tue (17 Sep)	Lecture on bacterial production method Lab: Count dilution plates	
	Thu (19 Sep)	Lab: Measure bacterial production using C14. Problem Set 2 due: Bacterial abundance	
	Tue (24 Sep)	¹⁴ C Activity Results Scintillation counter demonstration Explain calculations.	
4	Thu (26 Sep)	4: Extracellular Enzyme Assays Lecture on extracellular enzymes and fluorometry	Vallino
	Tue (1 Oct)	Lab: Measure enzyme activities	
5		5: Microbial food webs: Flagellate and ciliate grazing on bacteria	Vallino
	Thu (3 Oct)	Lecture Problem Set 3 due: Bacterial Production	
	Tue (8 Oct)	Lab on bacterial grazing w/ fluorescent beads.	
6	Thu (10 Oct)	6: Chemolithotrophy Lecture on Winogradsky column Column Observations Problem Set 4 due: Extracellular Enzyme Assays	Vallino
	Tue (15 Oct)	Measure Hydrogen Sulfide profiles in columns	
	Thu (17 Oct)	Measure methane gradient in columns Problem Set 5 due: Microbial food webs	
7		7: Microbial food webs: bacteria phytoplankton competition	Vallino
	Tue (22 Oct)	Lecture (short) Microcosm startup and sample	
	Wed (23 Oct)	Sample microcosm	
	Thu (24 Oct)	Sample microcosm Problem Set 6 due: Chemolithotrophy	
	Fri (25 Oct)	Sample microcosm (Analyze samples?)	
	Sat (26 Oct)	Sample microcosm	
	Sun (27 Oct)	Sample microcosm, analyze samples	
Mon (28 Oct)	Analyze microcosm samples		

Tue (29 Oct) Present and discuss microcosm results and calculations

8

8: Molecular Techniques

Ruff

Thu (31 Oct) Lab: DNA Extraction

Tue (5 Nov) Lab: Electrophoresis and PCR

Thu (7 Nov) Lecture on Molecular methods

Discuss results

***Problem Set 7 due: Microbial food webs: bacteria
phytoplankton competition***

Thu (14 Nov) Problem Set 8 due: Molecular Techniques

Grading:

Problem Sets 95% of grade

Participation 5% of grade

Final If problem sets are done independently, then there will not be a final exam.

All problem sets are due at the beginning of Thursday's class, as indicated by the syllabus