

SES Microbial Methods

Syllabus 2025

Module	Date	Topic	Instructor
1	Tue (2 Sep)	1: Introduction	Vallino
		Lecture only	
	Thu (4 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 (9 Sep)	Lab: Prepare dilution and coliform plates.	
		Fix samples for direct DAPI counts	
	Thu (11 Sep)	Lab: DAPI staining and counts	
		Examine plates	
		Problem Set 1 due: Introduction	
3		3: Bacterial production	Vallino
	Tue (16 Sep)	Lecture on bacterial production method	
		Lab: Count dilution plates	
	Thu (18 Sep)	Lab: Measure bacterial production using C14.	
		Problem Set 2 due: Bacterial abundance	
	Tue (23 Sep)	¹⁴ C Activity Results	
		Scintillation counter demonstration	
		Explain calculations.	
4	Thu (25 Sep)	4: Extracellular Enzyme Assays	Vallino
		Lecture on extracellular enzymes and fluorometry	
	Tue (30 Sep)	Lab: Measure enzyme activities	

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5: Microbial food webs: Flagellate and ciliate grazing on bacteria

Vallino

Thu (2 Oct) Lecture

Problem Set 3 due: Bacterial Production

Tue (7 Oct) Lab on bacterial grazing w/ fluorescent beads.

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6: Chemolithotrophy

Vallino

Lecture on Winogradsky column

Column Observations

Problem Set 4 due: Extracellular Enzyme Assays

Tue (14 Oct) Measure Hydrogen Sulfide profiles in columns

Thu (16 Oct) Measure methane gradient in columns

Problem Set 5 due: Microbial food webs

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7: Microbial food webs: bacteria phytoplankton competition

Vallino

Tue (21 Oct) Lecture (short)

Microcosm startup and sample

Wed (22 Oct) Sample microcosm

Thu (23 Oct) Sample microcosm

Problem Set 6 due: Chemolithotrophy

Fri (24 Oct) Sample microcosm (Analyze samples?)

Sat (25 Oct) Sample microcosm

Sun (26 Oct) Sample microcosm, analyze samples

Mon (27 Oct) Analyze microcosm samples

Tue (28 Oct) Present and discuss microcosm results and calculations

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8: Molecular Techniques

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Thu (30 Oct) Lab: DNA Extraction

Tue (4 Nov) Lab: Electrophoresis and PCR

Thu (6 Nov) Lecture on Molecular methods

Discuss results

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

Thu (13 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 end of day (Thurs), as indicated by the syllabus