

SES Microbial Methods

Readings 2025

There are no required textbooks in this course, but *Brock Biology of Microorganisms*, 12th ed. by Madigan, Martinko, Dunlap and Clark (2009) is highly recommended (ISBN: 0-132-32460-1)

Source for Topic	Section	pp.
1: Introduction		
<i>Brock Biology of Microorganisms, 12th Ed.</i>	1.0-1.4 Introduction	2 - 7
	1.9-1.10 Microbial diversity and modern era	18 - 21
	2.5 Elements of cell and viral structure	33 - 35
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	Winogradsky and chemolithoautotrophy	597 - 597
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	22.1 Methods in microbial ecology	653 - 656
	Chap 23 Microbial ecosystems	673 - 692
	24.10 Rumen	714 - 716
2: Bacterial abundance		
Porter & Feig (1980) <i>Limnology and Oceanography</i> 25	The use of DAPI for identifying and counting aquatic microflora	943 - 948
<i>Brock Biology of Microorganisms, 12th Ed.</i>	2.1-2.3 Seeing the very small	26 - 31
	5.3 Lab culture of microorganisms	113 - 114
	6.9-6.10 Cell counting	153 - 156
	22.2-22.3 Isolation and Staining Methods	657 - 661
	36.1 Public health and water quality	1026 - 1028
	36.4-36.8 Waterborne diseases	1033 - 1040
3: Bacterial production		
<i>Brock Biology of Microorganisms, 12th Ed.</i>	6.5-6.7 Growth of bacterial populations	147 - 150
	22.7 Measuring microbial activity	666 - 668
Simon&Azam (1989) <i>Marine Ecology Progress Series</i> 51	Protein content and protein synthesis rates of planktonic marine bacteria	201 - 213
4: Extracellular Enzyme Assays		
<i>Brock Biology of Microorganisms, 12th Ed.</i>	3.7-3.8 Proteins and structure	61 - 64
	4.4 Cytoplasmic membranes	73 - 75
	4.7 Outer membrane of Gram-negative bacteria	82 - 84
	5.4-5.5 Energetics and enzymes	114 - 117

Lehninger (1979) <i>Biochemistry</i>	Ch 8. Enzymes: kinetics and inhibition	183 - 195
H.-G. Hoppe (1993) <i>Aquatic microbial ecology</i>	Ch 48 Use of fluorogenic model substrates for extracellular activity measurements of bacteria	423 - 431
5: Bacterial Consumers		
<i>Brock Biology of Microorganisms, 12th Ed.</i>	18.9 Alveolates	528 - 530
Caron, D.A., et al. (2012) <i>Annu. Rev. Mar. Sci.</i> 4	Marine Protistan Diversity	467 - 493
Azam et al. (1983) <i>Marine Ecology Progress Series</i> 10	The ecological role of water-column microbes in the sea	257 - 263
6: Chemolithotrophy		
<i>Brock Biology of Microorganisms, 12th Ed.</i>	5.6 Oxidation-Reduction	118 - 119
	5.14 Catabolic diversity	131 - 133
	15.2-15.6 Photo-, chemolitho-, and methanotrophs	400 - 412
	15.8 Sulfate- and sulfur reducing	438 - 441
	16.15 Green sulfur bacteria	474 - 476
	16.18 Green nonsulfur bacteria	481 - 482
	17.4 Methanogenes	494 - 498
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	24.3 Nitrogen cycle	699 - 701
	24.4 Sulfur cycle	701 - 702
	24.5 Iron cycle	703 - 705
7: Microbial food webs: bacteria phytoplankton competition		
Caron et al. (1988) <i>Hydrobiologia</i> 159	Experimental demonstration of the roles of bacteria and bacterivorous protozoa in plankton nutrient cycles.	27 - 40
8: Molecular techniques		
<i>Brock Biology of Microorganisms, 12th Ed.</i>	Chap 13 Microbial Genomics	343 - 366
	22.4-22.6 Molecular methods	661 - 666
	22.8 Stable isotopes	669 - 671
Head, I.M., J.R. Saunders and R.W. Pickup (1998), <i>Microbial Ecology</i> 35	Microbial Evolution, Diversity and Ecology: A Decade of Ribosomal RNA Analysis of Uncultivated microorganisms	1 - 21
MoBio: Soil DNA isolation kit	Instruction manual	1 - 8