Marine Microbial Ecology (287A)
(Farooq Azam; fazam@ucsd.edu; 4105 HH; x46850)
Tuesday, Thursday 2:00-3:20; 4 units

Course description: In this course we will discuss major concepts in the study of microbes in the ocean, how the microbes function in their natural environments/microenvironments, and how their activities influence the grand cycles of elements, marine ecosystems, global climate and the Earth as human habitat.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>Lecture 1</td>
<td>4/4</td>
<td>Introduction, goals and history of the ecological study of marine microbes</td>
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<tr>
<td>Lecture 2</td>
<td>4/6</td>
<td>Ocean as microbial habitat I</td>
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<tr>
<td>Lecture 3</td>
<td>4/11</td>
<td>Ocean as a microbial habitat II</td>
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<td>Lecture 4</td>
<td>4/13</td>
<td>LAB: Epifluorescence, laser confocal &amp; Atomic Force microscopy</td>
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<td>Lecture 6</td>
<td>4/18</td>
<td>Prokaryote structure/function in ecosystem context I</td>
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<tr>
<td>Lecture 7</td>
<td>4/20</td>
<td>Prokaryote structure/function in ecosystem context II</td>
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<td>Lecture 8</td>
<td>4/25</td>
<td>Microbial phototrophy (Brian Palenik—to be confirmed)</td>
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<td>Lecture 9</td>
<td>4/27</td>
<td>Molecular phylogenetic diversity; genomics; proteomics (Eric Allen)</td>
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<td>Lecture 10</td>
<td>5/2</td>
<td>Microbial behavior and nutrient uptake strategies in the sea</td>
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<td>Lecture 11</td>
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<td>Microbial distribution and growth of Bacteria and Archaea in the sea</td>
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<td>Lecture 12</td>
<td>5/9</td>
<td>Fate of prokaryote production and biogeochemical implications</td>
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<td>Lecture 13</td>
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<td>Ecosystem roles of marine viruses (Forest Rohwer—to be confirmed)</td>
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<td>Lecture 14</td>
<td>5/16</td>
<td>Deep-sea and deep subsurface microbiology (Bartlett)</td>
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<td>Lecture 15</td>
<td>5/18</td>
<td>Microbial biogeochemical cycles in the ocean</td>
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<td>Lecture 16</td>
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<td>Physiological diversity of bacteria; energy &amp; C sources</td>
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<td>Lecture 17</td>
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<td>Integration of microbial processes into marine ecosystem function</td>
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<td>Lecture 18</td>
<td>5/30</td>
<td>Marine microbes’ structuring of oceanic biogeochemistry</td>
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<td>Lecture 19</td>
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<td>Microbes and marine pollutants; Ecology of marine pathogenic bacteria</td>
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<td>Lecture 20</td>
<td>6/6</td>
<td>Marine microbes and Earth’s habitability</td>
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<td>Lecture 21</td>
<td>6/8</td>
<td>Discussion</td>
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** 3/16, 18: pl arrange ½ individual discussion time

* 1-2 papers will be assigned for each lecture
**Individual ~1/2h sessions with the instructor for feedback on the take-home exam as well as discussion of the course material
Guest lectures’ schedule to be confirmed