Spring 2016

Stony Brook University
Department of Ecology and Evolution
College of Arts and Sciences

BEE 690 Seminar on Evolutionary Processes
Tuesdays, 5:30 pm to 7:30 pm
LS 648

Course Instructor: Dr. Robert W. Thacker
Office Hours: Thursdays, 3:00 pm to 5:00 pm
LS 678 or LS 650

Instructor Contact Information:
  e-mail: robert.thacker@stonybrook.edu
  phone: 631-632-8600

COURSE DESCRIPTION:
Seminars on selected topics concerning evolutionary processes.
Fall or Spring, alternate years, 0-2 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

Course Topic: Microbial Symbioses

Symbiotic interactions impact the ecology and evolution of microbes, fungi, plants, protists, and animals, often leading to evolutionary innovations and the colonization of novel environments. We will consider a broad diversity of interactions to view symbioses along a continuum from parasitism to mutualism. We will discuss how to test hypotheses about symbioses using a variety of methods, from large-scale phylogenetic approaches to small-scale manipulative experiments. Study systems will range from highly specific and strictly coevolving 1:1 interactions to more diffuse N:N interactions. Topics will include nutritional mutualisms, pathogenesis, modes of transmission, host specificity, and more. Enrolled students will be expected to actively participate in discussions each week.

COURSE LEARNING OBJECTIVES:

1. Gaining factual knowledge about the diversity of microbial symbioses.
2. Learning fundamental principles, generalizations, and theories about the ecology and evolution of microbial symbioses.
3. Learning to apply course material to improve thinking, problem-solving, and decisions.

COURSE REQUIREMENTS:

Attendance and Make Up Policy
Assignments and presentations are due on the dates specified unless excused by a physician or prior arrangements have been made with the instructor.

Late Submission Policy
If an assignment is submitted late, one-third (33%) of the grade for that assignment will be deducted for each week that it is late.
**Description and Schedule of Required Readings and/or Assignments.**

Each week, we will discuss at least 1 to 3 scientific publications (review papers, original research articles, etc.).

Each student will present a publication to the class at least once during the course (see the list of required readings below).

When presenting, students will select 2 additional publications related to the topic, making these papers available to other students by 5:00 pm on the Friday before their presentation. The presenting student will submit a MS Word or MS PowerPoint file containing at least 4 discussion questions by Noon on the day of their presentation.

When not presenting, students will read 1 to 3 assigned papers each week. In addition, students not presenting will submit 2 discussion questions by Noon on the day of the seminar.

All students are expected to actively participate in discussion each week.

**GRADING:**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of Weekly Discussion Questions</td>
<td>36 (3 points each week x 12 weeks)</td>
</tr>
<tr>
<td>Presentation</td>
<td>10</td>
</tr>
<tr>
<td>Presentation Articles (2+) and Questions (4+)</td>
<td>18</td>
</tr>
<tr>
<td>Participation During Discussions</td>
<td>36 (3 points each week x 12 weeks)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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*Alphanumeric breakdown of grades:*
- A= 93-100, A- = 90-92, B+ = 87-89, B = 83-86, B- = 80-82, C+ = 77-79, C = 73-76, C- = 70-72, D+ = 67-69,
- D = 63-66, D- = 60-62, F = 0-59

**CLASS PROTOCOL**

Please turn off your mobile phones when you are in class -- a ringing phone is annoying to the instructor and to your classmates. Please do not use Facebook, check e-mail, etc., during our discussion times – you will need to pay attention to fully participate in the course. Inappropriate use of electronic devices during class times will result in loss of participation points.

Because the scheduled class time is two hours, we will have a short break at the mid-point.

**CLASS RESOURCES**

Blackboard: Weekly readings are available on Blackboard, along with additional, supplementary readings.

Library resources: Additional, supplementary materials are available on Course Reserve.

A list of databases for article searches can be found here: [http://guides.library.stonybrook.edu/ee](http://guides.library.stonybrook.edu/ee)

Google Scholar can be reached here: [https://scholar.google.com/](https://scholar.google.com/)
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic/Readings</th>
<th>Who Leads?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan 26</td>
<td>Introduction to the seminar</td>
<td>Bob</td>
</tr>
<tr>
<td>1</td>
<td>Feb 2</td>
<td>Overview of Microbial Symbioses - Dubilier et al. 2015 - McFall-Ngai et al. 2013 - Bonafante &amp; Anca 2009</td>
<td>Bob</td>
</tr>
<tr>
<td>2</td>
<td>Feb 9</td>
<td>Squids &amp; Leeches &amp; Their Symbionts - Nyholm &amp; Graf 2012</td>
<td>1:</td>
</tr>
<tr>
<td>3</td>
<td>Feb 16</td>
<td>Legumes &amp; Rhizobia - Werner et al. 2015</td>
<td>2:</td>
</tr>
<tr>
<td>4</td>
<td>Feb 23</td>
<td>Aphids &amp; Buchnera - Douglas 1998</td>
<td>3:</td>
</tr>
<tr>
<td>5</td>
<td>Mar 1</td>
<td>Ants &amp; Fungi - Currie et al. 2003</td>
<td>4:</td>
</tr>
<tr>
<td>6</td>
<td>Mar 8</td>
<td>Sponge Microbiomes - Björk et al. 2013</td>
<td>5:</td>
</tr>
<tr>
<td></td>
<td>Mar 15</td>
<td>No Meeting – Spring Break</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Mar 22</td>
<td>Primate Microbiomes - Martínez et al. 2015</td>
<td>6:</td>
</tr>
<tr>
<td>8</td>
<td>Mar 29</td>
<td>Plants &amp; Fungi - Perry 1998</td>
<td>7:</td>
</tr>
<tr>
<td>9</td>
<td>Apr 5</td>
<td>Ecological Models: Metacommunities - Pillai et al. 2014</td>
<td>8:</td>
</tr>
<tr>
<td>10</td>
<td>Apr 12</td>
<td>Evolutionary Models: Cheaters - Jones et al. 2015</td>
<td>9:</td>
</tr>
<tr>
<td>11</td>
<td>Apr 19</td>
<td>Symbiont Dispersal Strategies - Skelton et al. 2015</td>
<td>10:</td>
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<td></td>
<td>Apr 26</td>
<td>No Meeting – Bob at NSF</td>
<td></td>
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<tr>
<td>12</td>
<td>May 3</td>
<td>Final Discussion - Papers TBA</td>
<td>Bob</td>
</tr>
</tbody>
</table>
Weekly readings are available on Blackboard, along with additional, supplementary readings.

**Week 1**

**Week 2**

**Week 3**
Werner et al. 2015. Evolutionary signals of symbiotic persistence in the legume-rhizobia mutualism. PNAS 112(33):10262-10269.

**Week 4**

**Week 5**

**Week 6**

**Week 7**

**Week 8**

**Week 9**

**Week 10**

**Week 11**

**Week 12**
To Be Determined
### Books on Reserve

<table>
<thead>
<tr>
<th>Title</th>
<th>Author</th>
<th>Edition</th>
<th>Year</th>
<th>Call Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Symbiotic Habit</td>
<td>Douglas, Angela E</td>
<td>2010</td>
<td></td>
<td>QH548.D678 2010 - Science/Engineering Library</td>
</tr>
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The University Senate Undergraduate and Graduate Councils have authorized that the following required statements appear in all teaching syllabi (graduate and undergraduate courses) on the Stony Brook Campus. See also http://www.stonybrook.edu/provost/facultyinfo/Syllabus%20Statement.doc

**DISABILITY SUPPORT SERVICES (DSS) STATEMENT**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website:
http://www.stonybrook.edu/ehs/fire/disabilities

**ACADEMIC INTEGRITY STATEMENT:**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

**CRITICAL INCIDENT MANAGEMENT:**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.