

# **BISC 345 – Symbiosis: from Parasitism to Mutualism**

## **Spring 2013, TX 11:00am-12:15 pm, 303 Shoemaker Hall**

### **Goals of course:**

Introduce students to the origin, evolution, ecology, and broad spectrum of symbiosis. Demonstrate the applicability of symbiosis to everyday life. Train students to read and analyze primary peer-reviewed literature.

### **Instructor:**

Dr. Tammy Goulet, 524 Shoemaker Hall, Tel: 915-7457  
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Office hours: By appointment

### **Course Material:**

#### Textbook:

Angela E. Douglas. 2010. The Symbiotic Habit. Princeton University Press.  
ISBN 978-0-691-11341-8.

#### Readings from the primary literature:

During the course, articles from peer-reviewed publications will be posted on blackboard. Students are required to read the assigned readings (from the text and the articles) and to come prepared to class.

### **Course requirements:**

Exams: During the semester, there will be three exams. The exams will include both factual and application questions. Students may be required to read a published paper and answer questions about the paper as part of the exam. A cumulative final will be given during final's week. All exams will be taken using a PRS radio frequency clicker that will be provided by Dr. Goulet for student use during the course. Exams will be based on material taught in class supported by assigned readings from the textbook and scientific articles. Students are responsible for all material and announcements made in class. Exams will include questions with multiple-choice answers and questions requiring fill-in-the blank answers.

In-Class Clicker Questions: The number, frequency and time during class in which clicker questions will be asked are at the discretion of the instructor, but students need to be ready to answer clicker question every time class meets. Clicker questions will be either on assigned readings or on the material covered in class. Students will answer the clicker questions with the PRS clicker. The total number of in class clicker question points will be determined at the end of the semester. That number will be set to 120% (giving 20% extra credit). From this number, the number of in class clicker question points yielding 100% will be calculated. Then, a calculation will be performed in order to determine the number of points a student earned out of the 25 in class clicker question points ( $\frac{\# \text{ in class clicker question points obtained}}{\# \text{ in class clicker question points yielding 100\%}} * 25$ ). Since extra credit is embedded in the in class clicker question point

calculation, there will not be an opportunity to make up in class clicker questions. Excused absences should be reported to the instructor and will be taken into consideration.

Interviews: During the semester, students will conduct interviews, and will re-visit the interviewee to ask a follow-up question. The interview shall be anonymous, but the age and gender of the interviewee will be noted. The only rule – students need to conduct a real interview. Students shall not make up an interview. Students will receive credit for handing in the complete interviews and a follow up question to the interview.

Invited guest scientists: During the semester, guest scientists will meet with the class. In preparation for the visiting scientist, the students will read an article that the scientist wrote and write three questions pertaining to the article content and topic and three questions pertaining to the scientist's career in science. The questions will be discussed with the visiting scientists. Additional scientists may be added. To date, the scientists that will visit the class include:

Dr. Laura D. Mydlarz, Department of Biology, The University of Texas, Arlington, TX. Feb. 7.  
<http://www.uta.edu/biology/mydlarz/index.htm>

Dr. Malcolm Hill, Department of Biology, University of Richmond, VA, Feb. 14.  
<http://biology.richmond.edu/faculty/mhill2/#>

Dr. Ryan Garrick, Department of Biology, University of Mississippi, MS, Mar. 5.  
<http://olemiss.edu/depts/biology/people/faculty/garrick/index.php>

Dr. Jason Hoeksema, Department of Biology, University of Mississippi, MS, Mar. 7.  
<http://www.olemiss.edu/depts/biology/hoeksema/index.html>

Class participation and group work: Students will receive points for class participation. This participation also includes students' contribution to the group activities that will occur during the class time.

A total of 300 points will be divided into:

1. Three exams – 50 points each (150 points).
1. In-class clicker questions – 25 points.
2. Interviews and other written assignments – 15 points.
3. Class participation/group work – 10 points.
4. Final exam – 100 points.

Grade distribution:

A = 270-300

B = 240-269

C = 210-239

D = 180-209

F = 179 and below

Exam make-up policy:

- (1) A student who misses one exam can make it up, **if the instructor judges that the student had a good reason for missing** (family emergency, health issues). The make up exam will be given within a week of the student's return to school.
- (2) Under special circumstances, and with the instructor's approval (e.g. University-excused absence), students may arrange ahead of time to make-up an exam before the class exam.
- (3) In all cases, students must notify the instructor that they missed the exam as soon as possible, make an arrangement to make-up the exam, and bring appropriate documentation to justify their absence. Otherwise they will earn a zero on that exam.

Academic misconduct and its consequences:

According to UM Academic Conduct and Discipline policy: "Dishonesty, cheating, or plagiarism, or knowingly furnishing false information to the University are regarded as particularly serious offenses." In this course, for example, cheating on an exam or in class clicker questions, or taking an exam or in class clicker questions for someone else, or copying an assignment from someone else and handing it as one's own, will be severely punished. At the discretion of the instructor, the student can receive an F on the assignment or an F in the class (without the possibility of invoking the forgiveness policy).

**Course topics and exam dates:**

During the course, we will cover the following topics:

Introduction to Symbiosis  
How symbioses are formed  
Symbiont Transmission  
Evolution of Symbiosis  
Symbiosis and coevolution  
Symbiosis the Spectrum - Parasitism to Mutualism  
Endosymbiosis vs. Exosymbiosis vs. behavioral symbiosis  
Viral symbiotic associations  
Symbiosis as a source of novel metabolic capabilities  
Novel structures in symbiosis  
Nutritional interactions in symbiosis  
Host or symbiont control  
Symbiosis and sexual reproduction  
Symbiosis and clonality  
Symbiosis and the origin of the eukaryotic cell

These topics are interwoven and will be discussed on multiple occasions.

**The three exams will be given on:**

February 19  
March 21  
April 16

**The final exam will be given on Tuesday, May 7 at noon in 303 Shoemaker Hall.**

This syllabus is subject to change at the discretion of the instructor to accommodate instructional, and/or student needs.