**BOT4935 - Plant Symbioses**

Spring 2014 - Dr. E. Christine Davis

Tuesdays, Periods 6 – 7 (12:50 – 2:45) in Carr 221

2 credits

In this course, I hope to foster a deeper understanding of the crucial role symbioses play in shaping the diversity of life on the planet. The course will devote roughly equal time to discussing broad concepts – such as generalities among symbioses, origins and establishment of symbioses, coevolution and co-speciation – and learning the specifics of well-studied exemplars of plant-bacterial, plant-fungal, plant-animal, and plant-plant symbioses.

Our study will consist of instructor and student-led discussions of texts and primary literature, short written assignments, and observation and enjoyment of living examples of plant symbioses.

Upon completion of this course, you will be able to:

* Define symbiosis in several ways
* Describe the evolutionary and ecological significance of symbioses
* Explain our current understanding of how symbioses form and how they are maintained
* Discuss how symbiosis can lead to diversification
* Summarize the specifics of some symbioses involving
  + Plants and bacteria
  + Plants and fungi
  + Plants and animals

You will also practice:

* Evaluating and synthesizing journal articles
* Leading a discussion with classmates

Required texts:

***The Symbiotic Habit,*** Angela E. Douglas. 2010.

Also, **book excerpts and journal articles** posted on the Sakai course site.

Course grading:

Participation (12 discussions @ 3 points each) 36 points (~48%)

Leading a discussion (4 @ 5 points each) 20 points (~26%)

Written discussion synopses (4 @ 5 points each) 20 points (~26%)

Total 76 points

See the Sakai course site for rubrics detailing how each component of your grade will be determined.

Grading scale:

90 – 100% = A; 80 – 89.9% = B; 70 – 79.9% C; 60 – 69.9% D; below 60 = E

Course attendance:

Attendance is required and essential for success in this course and is a component of your participation grade. I understand that absences happen, but if you make this a habit, you are guaranteed to perform poorly.

Grade curves and extra credit:

There will be NO curve applied to grades. There MAY be opportunities for extra credit – if so, such opportunities will be announced in class and offered to all students.

Make up policy:

If you have a valid documented excuse and notify me in advance, you may be able to make up missed discussion assignments. I will determine this on an as-needed basis.

Policy on electronic devices:

Use them if you want, but if they become distracting to your classmates, you will be asked to leave. Also, please note that the use of devices for socializing during class is very obvious to your classmates and your instructors. We’ll make a mental note of it as disrespectful, and it leaves a negative impression.

UF counseling services

Resources are available on campus for students having personal problems or lacking clear career and academic goals. The resources include:

UF Counseling & Wellness Center, 3190 Radio Rd, 392‐1575, psychological and psychiatric services.

Career Resource Center, Reitz Union, 392‐1601, career and job search services.

Many students experience test anxiety and other stress – related problems. “A Self Help Guide for Students” is available through the Counseling Center (301 Peabody Hall; 392-1575) and at their web site: http://www.counsel.ufl.edu/.

Academic Honesty Policy

All students registered at the University of Florida have agreed to comply with the following statement:

“I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”

In addition, on all work submitted for credit the following pledge is either required or implied:

“On my honor I have neither given nor received unauthorized aid in doing this assignment.”

If you witness any instances of academic dishonesty in this class, please notify the instructor or contact the Student Honor Court (392-1631) or Cheating Hotline (392-6999). For additional information on Academic Honesty, please refer to the University of Florida Academic Honesty Guidelines at: https://catalog.ufl.edu/ugrad/current/advising/info/student-honor-code.aspx#honesty.

Important – Plagiarism:

Plagiarism is also a violation of the Academic Honesty Policy. It will not be tolerated. Please review how to define plagiarism and how to avoid it: http://web.uflib.ufl.edu/msl/07b/studentplagiarism.html

Accommodations for students with disabilities:

Students who will require a classroom accommodation for a disability must contact the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). Please see the University of Florida Disability Resources website for more information at: http://www.dso.ufl.edu/drc/. Note that the student should provide documentation of a requirement for accommodation by the second week of classes. No accommodations are available to students who lack this documentation. It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate the student.

Course schedule (subject to adjustment)

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| **Date** | **Topic** | **Reading** | **Discussion** |
| Jan. 7 | **How do we define "symbiosis" and how is symbiosis significant?** | Syllabus | Intro - Sign up for discussion leading - Example symbiosis 1 - Ant plants |
| Jan. 14 | Margulis p. 5 - 12; Douglas p. 12 - 23 | The significance of symbioses (Dr. Davis leads discussion) |
| Jan. 21 | Paracer and Amadjian 117 - 122; Bonfante and Genre 2010 | Example symbiosis 2 - Mycorrhizae |
| Jan. 28 | Douglas p. 1 - 11; Paszkowski 2006 | Defining symbiosis |
| Feb. 4 | Clay and Schardl 2002 | Example symbiosis 3 - Grass endophytes |
| Feb. 11 | **How do mutualistic symbioses evolve and how are they maintained?** | Douglas p. 24 - 38; Heil et al. 2013 | Symbiotic spectra from antagonist to mutualist |
| Feb. 18 | Adams and Duggan 2012 (in Perroto and Balusˇ ka) 93-114 | Example symbiosis 3 - Cyanobacteria |
| Feb. 25 | Douglas p. 39 - 55; Brundrett 2002 | Evolution and partner capture |
| Mar. 4 | **Spring break** | **None** | **No class** |
| Mar. 11 | **Cheaters and conflict resolution in mutualistic symbioses** | Paracer and Amadjian 192 - 195, Jandér and Herre, 2010 | Example symbioses 4 - Pollination symbioses - *Ficus* and *Yucca* |
| Mar. 18 | Douglas p. 56 - 66; Althoff et al. 2006 | Costs of symbiosis and cheating |
| Mar. 25 | Douglas p. 66 - 90; Gilson 2001 | Vertical transmission and assimilation |
| Apr. 1 | Paracer and Amadjian 65 - 69; Olivares, Bedmar, and Sanjuán 2013 | Example symbiosis 5 - Legumes and rhizobia |
| Apr. 8 | **Coevolution and mutualistic symbioses** | Douglas 91 -105; Markmann et al. 2008 | Establishment of symbioses |
| Apr. 15 | Douglas 125 - 150; Picullel et al. 2008 | Diversification and coevolution |
| Apr. 22 | Course synthesis and evaluation |  |