Introductory Botany – BOT 1010

Department of Biological Sciences, Florida International University

Spring 2017 Syllabus & Schedule—*revised 2/6*

Please read this syllabus and schedule *thoroughly* by the first day of class and ask any questions ASAP. You are responsible for knowing this information!

Your instructor:

John Cozza, jcozza@fiu.edu (for quickest response use this address, not Blackboard)
****Please include "BOTANY" in the subject line of all emails**** Phone: 305-348-4932.

Office hours in OE 216: Mon 2-3, 5-6+; Tues 11-12, 2-3, & 5-6+; Weds 2-3, 5-6+ (but not the evenings of 2/1 & 3/1), informally before or after class, or by appointment.

Lecture and discussion (attendance is required):

MWF 4:00 – 4:50 in OE 134

Introduction:

In this non-biology majors course, we will explore the amazing—and yet secret to many—lives of plants. You will find out how plants obtain food literally out of thin air, and how they find mates and fight off enemies. You will appreciate the diversity of plants including some truly bizarre ones, and study their essential roles in our lives. We will employ active and interactive learning, with experiences including observation, writing, and analysis.

Prerequisites:

None, just curiosity and interest. Review of the relevant concepts from high school biology would be helpful!

Text (required):

Graham, L., J. Graham and L. Wilcox. 2015. Plant Biology, 3nd ed., LJLM Press, available for $40 as an ebook from http://www.ljlmpress.com/plant_biology.html. Do not make and share copies—*this would be stealing from the authors, and is illegal*.

This book will provide essential background reading for most of the topics covered in class. Topics not adequately covered by the text will be supported by required readings posted on Blackboard. If you prefer an actual physical book, the out-of-print 2nd edition is acceptable. Two copies are on reserve at the library, under "RESB157.04—Cozza."

Clickers (required):

We will use **i-clickers** (the device only, *not the app*—available at the bookstore) to gauge your understanding of the concepts, and to stimulate thought and discussion. **You will earn extra credit by using the clickers.** Clicker questions might appear *in any class meeting.* You are responsible for the proper functioning of your clicker.

Blackboard:

Here you will find the course website, which will include updated syllabus and schedule,

course announcements, lecture powerpoints, required additional readings, supplemental resources, discussion board, and gradebook. Go to fiu.blackboard.com

Learning goals: By the end of the course, you will be able to

- Explain how plants function, reproduce, and are adapted to their environment
- Discuss the importance of plants to people and other organisms
- Recognize major groups of plants, and identify and discuss evolutionary trends
- Interpret the results of basic botanical experiments and other studies

Grading:

Midterm exams (4 @ 15%)	60%
Final exam	optional; replaces lowest or missed midterm
Assignments (3 @ 6.7%)	20%
Class participation activities	20%
Extra credit (clickers)	up to 5% extra
Service activity	required to get a grade

Grade scale: A = 93-100%, A− = 90-92%, B+ = 87-89%, B = 83-86%, B− = 80-82%, C+ = 77-79%, C = 70-76%, D = 60-69, F = 0-59%.

Course grades will be rounded to the nearest 1%. So, for example, if your course grade comes out to 89.5, that will round up to 90 and an A−, but an 89.4 will round down to 89 and a B+. **There will be no exceptions, no curving, no grades dropped, and no unearned points will be added** to anyone's grade. The only extra credit available will be that earned by using your clicker, and by participating in and writing about selected enrichment activities announced in class.

Midterm exams:

Midterm exams will last 50 min, and will consist of about 50 scantron questions. The optional final exam will last the full 2 hours, with about 100 scantron questions equally divided among the material for the four midterms.

Everything covered or done in lecture (including participation activities), and supported by the corresponding chapters and readings, may be on the exams. Exam questions will vary in difficulty from easy to challenging. A solid understanding of the concepts and examples discussed should be enough to pass (C), but to achieve a superior grade (A), you will also need to synthesize concepts and apply them to new situations.

Please bring a #2 pencil, eraser, and photo ID to all exams. *You may not have a phone, tablet, digital watch, or any other kind of electronic device* on you—they must be turned off and put away in your bag or backpack. The scantron will be provided. Allow extra time to arrive on exam days. If you are more than 30 minutes late for an exam or the first person has completed it and left the room, you will not be able to take the exam.

If you miss an exam for a valid university-approved reason (medical emergency, serious accident, death in the immediate family, jury or military duty, FIU athletics, etc.), you would need to let me know ASAP (beforehand if possible) and provide official documentation (hospital admit, doctor's or military orders, police report, coach's letter, etc.). Then you must take the final exam as the make-up for the missed exam.

Final exam:

The cumulative final exam is optional (unless it is a make-up for a missed midterm exam). You will decide whether to take the final after exam #4 grades are posted—I will post a grade estimator and a sign-up sheet. *If I do not know you want to take the final, I will not print an exam for you!* If you do take the final, it will replace your lowest midterm grade (or a missed exam). If your grade on the optional final is lower than all four of your midterm grades, the final exam grade will not count.

Written assignments:

You will have three outside-of-class written assignments. Details will be given in class. Note the dates on the schedule. ***We will use turn-it-in.com to ensure originality.***

1) **Service activity report**. You will write a 1-2 page (typed) description of what you did, what you learned, and how you helped with plant conservation in your required volunteer service work (see below).
2) **Outdoor plant safari**. You and a partner will find and photograph examples of the major groups of plants and their key features, and make a labeled powerpoint.
3) **Ecological footprint quiz**. You will take an online interactive quiz about the impact of your lifestyle on the planet, and complete a 2 page worksheet. The worksheet and instructions will be posted on Blackboard. To facilitate grading, ***you must use the form and you must type to receive credit.*** No handwritten responses can be accepted.

Class participation activities:

On most class days, we will do an in-class interactive activity. These may be discussions of plant-related controversies, case studies, current events, or feedback about the lecture or reading and your understanding of it. For each such activity, you will be asked to write and hand in a brief response in class. ***You must be present in class to participate, and you cannot make up activities afterwards!***

Your written responses will be graded as "full effort" (1 point), "partial effort" (0.5 point) or "minimal effort or copied" (0 point). To earn full credit, you must show clear evidence of thought and engagement, and communicate that in concise, complete sentences. You may discuss your ideas with your neighbor, but your written response must be entirely your own original work.

Your final participation grade will be the percentage of the total possible points you earned (with no penalty for missing one activity). For example, if there were 30 participation activities total and you earned 26 points, your participation grade would be

(26 + 1)/ 30 x 100 = 90. *Participations count more than an exam, and are an easy way to **raise your grade** if you attend every class, or conversely, a sure way to lower your grade if you miss class*.

Clicker extra credit:

You will earn 1 raw clicker point for participating in each question, and 1 additional point if you answer it correctly. At the end, your raw point total will be scaled to a maximum of 5% extra credit, with the highest total in the class scaling to the full 5%. For example, if you earn 145 raw clicker points and the person with the highest total of raw points got 172, then you would get 145/172 x 5 = 4.22 points added to your course grade.

Service activity:

You will do a half-day of relevant volunteer service such as helping with habitat restoration or tree planting (e.g. with TREEmendous Miami, Urban Paradise Guild, or Miami-Dade County); volunteering at a botanical garden (e.g. Fairchild, UM's Gifford Arboretum, FIU Nature Preserve), or giving an educational lesson about plants or conservation to a school or community organization. I will give some suggestions for upcoming activities as the semester progresses. You may choose an activity that I don't mention, but then *please discuss your idea with me in advance.* Don't wait until the last minute to explore this! ***You must do an approved and officially verified service activity to receive a grade in the course.*** One of your written assignments will be a brief report on what you accomplished in your service activity.

Associated Laboratory:

The laboratory (BOT 1010L) is a separate one credit course taught by a graduate teaching assistant. Although lecture and lab are independent, the topics and activities are mutually reinforcing. However, topics will not necessarily be covered simultaneously in lecture and lab. Labs meet weekly, beginning on the first week of classes. The lab syllabus is posted on Blackboard.

The laboratory work, outdoor activities, and field trips will provide hands-on experiences, including experiments, gardening, and the identification of local plants. For the fullest appreciation of plants and botany, ***it is highly recommended that you take the lab at some point!*** Although I am always eager to receive feedback from you about the lab as well as the lecture, please ask your TA first if you have any lab-specific questions or concerns.

General expectations and how to succeed:

- **Read the text** and any additional assigned readings thoughtfully *before* the corresponding lecture.
- **Attend every class** and *actively* participate in discussions, interactive questions, and activities. Research by Dr. Helen Young (Middlebury College) showed a 2% lower grade for each missed hour of class in a similar course. Likewise, many studies show that active, social engagement with the material produces meaningful, enduring learning.

- **Take good lecture notes**, *preferably handwritten*. Indicate any areas of difficulty to look up after class. Structure your notes as lists, outlines, concept maps, or in some other form that is useful to you. This initial processing of the information begins the process of making it your own, aka *learning* it!
- **Minimize distractions.** Texting, social media, online activity, videos, etc. erases learning, according to research. In class, it also unfairly distracts your neighbors.
- **Ask questions**; ask for clarification ASAP. There are no stupid questions!
- **Help your neighbor** and contribute to the group. If you help each other, everyone will do better including you!
- **Review concepts** ASAP after class, using the book and other resources to clarify any hazy areas. For the most enduring learning, try to find the answers to your questions yourself, or through active participation in a study group.
- **Come to office hours** (or make another time to see me) with any questions you are still unsure about, or just to talk about plants!
- **Read all course emails and announcements** on Blackboard. You are responsible for all information in them, as well as anything announced or posted in class.
- **The prime directive** is for you to have a valuable experience and succeed! I am here to help you, and I am most happy to do so, but you must ask for that help and do your part, too.

Honor and conduct policies:

The FIU honor policy will apply fully—see Section 2.44 of the Academic Affairs Policies and Procedures Manual at http://academic.fiu.edu/polman/sec2web.htm. Any cheating or plagiarism on exams or written work will result in a grade of F for the assignment and, if warranted, the course. Using more than one clicker will result in temporary confiscation of the outlaw clickers, and permanent loss of clicker points for the owner and user.

This class is a safe place for all. FIU does not tolerate sexual harassment or any other civil rights violation against any student or course personnel.

The FIU Student Code of Conduct is available at http://conduct.fiu.edu/code/.

FIU's discrimination and sexual harassment policies are available at http://regulations.fiu.edu/regulation.

This syllabus information, including course requirements and grading, may change at any time to better meet the needs of the group, or due to unforeseen circumstances. The most current version will be kept updated on Blackboard, so check there if in doubt.

The schedule below, especially the amount of time devoted to each topic, may also change at any time. Exam dates are meant to be firm, and would only change under the most pressing circumstances. See Blackboard for the most current version of the schedule.

Week	Date	*Schedule:* Topics and exams	Reading due (chapter) and *assignments*
1	9 Jan	Course introduction; What is life? *1) Service activity introduction*	Syllabus; 19.1-19.2; Essay 3.1
	11	What is a plant?	1; 22.1
	13	What is a plant?	1; 22.1
2	16	Martin Luther King holiday—no class	*[Tues Jan 17—last day to drop w/o cost]*
	18	What is science?	1 *[Weds Jan 18—last day to pay or get loan]*
	20	What is science?	1, Essay 12.1; Gillis (NYT) 2015
3	23	The plant cell	5
	25	Photosynthesis	6
	27	Genetic variation and evolution*	17; **Exam 2 covers "Speciation"*
4	30	Phylogeny and the tree of life	17
	1 Feb	EXAM #1 on weeks 1-3	
	3	Phylogeny and the tree of life	18; What is phylogeny?/ Genetic considerations (TOL 2007); What is cladistics? (Clos 1996)
5	6	How plants evolved: the green algae	20.2-20.3; Kingdom Chlorophyta (Cyr 2009)
	8	The plant life cycle	14
	10	Plant diversity: evolutionary trends	22.1-22.3; Adaptive features of plants (Cyr & Schaeffer 2009)
6	13	Ancestral plants: "Bryophytes" and Lycophytes	22.4
	15	Vascular plants and the first trees	22.3; Essay 22.1; Taggart 2003, O'Donoghue 2007, Meyer-Berthaud 2007
	17	Got (big) leaves? Ferns	22.4
7	20	Got seeds? Gymnosperms	23
	22	EXAM #2 on weeks 4-6	
	24	Got seeds? Gymnosperms	23
8	27	Got flowers? Angiosperms	24.1-24.2
	1 Mar	Got flowers? Angiosperms *2) Outdoor plant safari assignment*	24.1-24.2
	3	Plant growth, form, and function	9
9	6	Form and function / Stems and wood	9; 10
	8	Stems and wood	10
	10	Roots and plant nutrients	11; 21.3
	13-17	Spring break—no class	*[Mon Mar 20—last day to drop]*
10	20	Leaves	12
	22	Leaves	12; Moran 2006
	24	Plant behavior and hormones	13; Cossins 2014; *Plant safari due on Blackboard*

Week	Date	*Schedule:* Topics and exams	Reading due (chapter) and *assignments*
11	27 29 31	Sex, flowers, and pollination EXAM #3 on weeks 7-10 Fruits, seeds, and dispersal	24.1-24.3; 25.1-25.3 24.4-24.6; 25.4
12	3 Apr 5 7	Plants & people: Food Plants & people: Food 3) *Ecological footprint assignment* Medicines and other products	2; Essays 9.1, 11.1, & 14.1; Diamond 1994 2; Essays 9.1, 11.1, & 14.1; Diamond 1994 2.4; Essays 11.1, 13.1, & 28.1; Vietmeyer 2008
13	10 12 14	Sacred, magical, and monstrous plants Plant breeding and biotechnology Plant ecology	Walker 2009, Ligon 1997 16; Essay 15.2; Hakim (NYT) 2016 26
14	17 19 21	Movie: *The Queen of Trees* Plants, people, and sustainability + evaluations (*online*) EXAM #4 on weeks 11-14	Van Noort 2004 30; *Ecological footprint and service activity report due in class & on Blackboard*
Finals	24 Apr	Optional or make-up FINAL EXAM (cumulative): 2:15-4:15 pm in PCA 135	

Course readings and resources (all are available on Blackboard)

Clos, L. 1996. What is cladistics? http://www.fossilnews.com/1996/cladistics.html. Accessed 1/5/2014.

Cossins, D. 2014. Plant talk. *The Scientist* magazine 28(1): 37-43. http://www.the-scientist.com/?articles.view/articleNo/38727/title/Plant-Talk/. Accessed 1/10/2016.

Cyr, R. 2009. Kingdom Chlorophyta. *From* Protists II - Kingdoms Stramenopila, Rhodophyta, and Chlorophyta. Biology 110 website, Pennsylvania State University. https://wikispaces.psu.edu/display/110Master/Protists+II+-+Kingdoms+Stramenopila%2C+Rhodophyta%2C+and+Chlorophyta. Accessed 1/11/2015.

Cyr, R. and S. Schaeffer 2009. Adaptive features of plants. *From* Plants I - Evolution and Diversity, and Non-Vascular Plants. Biology 110 website, Pennsylvania State University. https://wikispaces.psu.edu/display/110Master/Plants+I+-+Evolution+and+Diversity,+and+Non-Vascular+Plants. Accessed 1/11/2015.

Diamond, J. 1994. Spacious skies and tilted axes. *Natural History* magazine 103(5): 16-23.

Gillis, J. 2015. Short answers to hard questions about climate change. *The New York Times*. Nov 28. http://www.nytimes.com/interactive/2015/11/28/science/what-is-climate-change.html. Accessed 1/8/2017.

Hakim, D. 2016. Doubts about the promised bounty of genetically modified crops. *The New York Times*. Oct 29. http://www.nytimes.com/2016/10/30/business/gmo-promise-falls-short.html. Accessed 1/7/2017.

Ligon, L. 1997. Seminole medicine, plants and religion. *Mother Earth Living*. http://www.motherearthliving.com/Gardening/Seminole-medicine-plants-and-magic.aspx#axzz3OZkx7ZvV. Accessed 1/11/2015.

Meyer-Berthaud, B. and A-L. Decombeix 2007. A tree without leaves. *Nature* 446(19): 861-862.

Moran, J. (2006). Life and death in a pitcher. *Natural History* magazine, 115(8), Oct: 56-62.

O'Donoghue, J. 2007. Primeval forest: the evolution of trees. *New Scientist* 196(2631): 38-41.

Plumer, B. 2013. This terrifying chart shows we're not growing enough food to feed the world. *The Washington Post*. http://www.washingtonpost.com/blogs/wonkblog/wp/2013/07/01/this-unsettling-chart-shows-were-not-growing-enough-food-to-feed-the-world/. Accessed 1/7/2017.

Taggart, R. 2003. The first vascular land plants. Michigan State University. http://taggart.glg.msu.edu/isb200/fland.htm. Accessed 1/11/2015.

TOL (Tree of Life web project). Maddison, D. R. and K-S. Schulz (eds.) 2007. What is Phylogeny? / Genetic connections. The Tree of Life Web Project. Home page: http://tolweb.org. http://tolweb.org/tree/learn/concepts/whatisphylogeny.html and http://tolweb.org/tree/learn/concepts/geneticconnections.html. Accessed 1/5/2014.

Van Noort, S. 2004. How fig trees are pollinated. *Veld and Flora* 90(1): 13-15. http://www.figweb.org/references/pdf/veld_v90_n1_a11.pdf. Accessed 1/11/2015.

Vietmeyer, N. 2008. Underexploited Tropical Plants with Promising Economic Value: The Last 30 Years. *Trees for Life Journal:* 3(1). http://www.tfljournal.org/article.php/20070821145316291. Accessed Sept. 2014.

Walker, M. 2009. Sacred plants of the Maya forest. BBC Earth News. http://news.bbc.co.uk/earth/hi/earth_news/newsid_8083000/8083812.stm. Accessed 1/11/2015.