

# **BIOL 300 – BOTANY**

## **SPRING, 2020**

MWF 11:00 – 11:50 AM, 281 Rita Liddy Hollings Science Center (RITA) (this is our lab room)  
W 1:00 – 5:00 281 RITA; meet at the Library parking lot for off-campus field trips

**INSTRUCTOR:** Dr. Jean Everett  
**OFFICE:** 215 RITA  
**OFFICE HOURS:** Fridays 12-3pm, or by appointment  
**OFFICE PHONE:** 843-953-7843 – we now have VoIP, and I can get messages by email  
**MAILBOX:** Biology Department Office, 255 RITA  
**EMAIL:** everettj@cofc.edu (If I don't respond, please try again or phone me.)  
**WEBPAGE:** OAKS

## **REQUIRED TEXT:**

Raven, Biology of Plants, 8<sup>th</sup> Edition. Evert, RF and Eichhorn, SE, W.H. Freeman & Co.

## **HIGHLY RECOMMENDED BUT OPTIONAL TEXT:**

Porcher, R.D. and D.A. Rayner. 2002. A Guide to the Wildflowers of South Carolina. University of South Carolina Press.

## **COURSE GOALS:**

Students will:

- improve skills in critical thinking and logical reasoning
- gain an understanding of the importance of plants to all other forms of life on earth
- develop an understanding of the structure, function and diversity of the plant and fungi kingdoms
- develop a basic understanding of several local plant communities and the underlying ecosystem factors that control vegetation patterns

## **LEARNING OUTCOMES:**

Students who successfully complete this course will demonstrate that they:

- have improved skills in critical, synthetic, scientific thinking and logical reasoning
- are able to successfully read, summarize and discuss scientific papers in the primary literature
- know how plants are structured and how they grow (both primary and secondary growth)
- understand photosynthesis and its importance as the source of energy for almost all other forms of life on the planet
- understand transpiration and its importance to both plant function and the global hydrological cycle
- understand plant nutrition and the sources of essential nutrients (primarily soils)
- have a basic understanding of soil characteristics (including the influence of geomorphology and topography) in determining plant species distributions
- understand the evolution of reproductive strategies and how these have changed since plants emerged
- have a basic understanding of secondary metabolites and how both internal and external cues regulate plant function
- have a basic understanding of fungi form, function and reproduction

**GRADE:**

Midterm Exams (3) = 30%

Comprehensive

Final Exam = 10%

Papers (3) = 30%

PowerPoint = 5%

Lab Reports = 10%

Lab Participation = 5%

Lab Final = 10%

GRADING SCALE				
	88-89% = B+	78-79% = C+	68-69% = D+	
93-100% = A	83-87% = B	73-77% = C	63-67% = D	
90-92% = A-	80-82% = B-	70-72% = C-	60-62% = D-	<60% = F

**The midterm and final exams** may include short answer, definitions, essay, matching, and multiple choice questions, and identifications of cell structures, tissues, organs, etc from PowerPoint slides, with emphasis on material covered in both lecture and lab. All electronic devices will be surrendered for the duration of each exam.

**Papers** will be short (3-5 pages) reviews of a topic of your choice related to botany. Each paper will be based on at least 10 modern primary literature sources; additional sources both primary and secondary are encouraged. Each paper must be checked with the plagiarism checker available on OAKS, and your similarity score must be addressed. Each paper will be an improvement over the previous based on a grading protocol posted on OAKS. The paper grades will thus be weighted at 5%, 10% and 15% for each successive paper.

**The PowerPoint** will be your class presentation of some aspect of the ecological and/or economic value of plants. Topic will be your choice, but remember your presentation time will be limited. Each student will present an additional PowerPoint on plant regulation as part of your lab participation grade. I'll have Google sign-up sheets for the lectures as soon as drop/add is over.

**Lab reports** will include brief but complete summaries of lab activities, including both inside labs and field labs. I will have worksheets for most labs, and these will form the basis of those lab reports. Lab reports will be joint efforts (Google Slides); one student will take the lead as editor, and each student will contribute. Lead editor will be first to sign up. Each of you will be lead editor for at least 2 reports. Sign-up sheet will be on OAKS after drop/add is over. We'll discuss more in our first lab.

**Lab participation** may include occasional quizzes conducted in the lab, but mostly contributions to class Google documents and overall active participation in both the lab and in the field. Quizzes may include brief questions similar to the midterm and final exams, including questions that indicate that you are prepared for the day's lab.

**The lab final** may include short answer, definitions, essay, matching, and multiple choice questions, and identifications of cell structures, tissues, organs, etc from PowerPoint slides, microscope slides or live specimens, with the emphasis on material covered in lab. All electronic devices will be surrendered for the duration of the exam.

**Graduating Seniors** are **REQUIRED** to take the MFT exam. The Major Field Test for Biology is one of our most important departmental assessment tools. Graduating seniors will be given significant extra credit. The Associate Chair, Dr. Melissa Hughes, will organize the timing of the exam in the last couple weeks of the semester. There will be multiple time slots available.

**PLEASE NOTE:** No makeups will be given for exams without prior notice and a documented absence memo from the Student Affairs Absence Memo Office. In an emergency, contact me **as soon as possible** for makeup arrangements. Also, no student will be permitted to begin an exam if any student has already completed the exam. Lab quizzes and the lab final **CANNOT** be made up.

**ATTENDANCE:** Your final grade will be dropped by 5% if you miss more than 3 classes, and by 10% if you miss 5 or more classes. Excessive tardiness (5 minutes) will count as an absence. If you have a documented absence memo from the Student Affairs Absence Memo Office, you will be excused from that absence. If you are too sick to come to class, you are sick enough to see a doctor.

**ACADEMIC INTEGRITY:** I expect each of you to work independently unless specifically instructed otherwise, and to adhere to the College of Charleston Honor System as described in the Student Handbook.

**SPECIAL NEEDS:** If you will need any special accommodations to complete the requirements for this course, please contact me as soon as possible.

**ALLY PROGRAMS:** I am a Safe Zone Ally and a Green Zone Ally, and happy to assist.

**FOOD AND HOUSING INSECURITY:** If you are not economically secure in food and housing, the College has assistance programs. You may contact the Dean of Students directly, or I will be most happy to confidentially facilitate assistance.

**STUDENT WELL BEING:** we are well aware of the additional personal challenges many of you face, and we have resources in place to help. You may contact the Dean of Students directly, or I will be most happy to confidentially facilitate assistance.

**TENTATIVE LECTURE and LAB SCHEDULE**

<u>DATE</u>	<u>TOPIC</u>	<u>CHAPTER</u>
8 Jan.	Introduction	1
Lab	Why plants; what do you want from lab? <i>Macbridea</i> experiments. Plant some seeds – let’s grow some stuff!!!	1, <b>Google Lab Rept.</b>
10 Jan.	<b>HOW PLANTS ARE BUILT</b> – the anatomy of cells,	3, 22 – 26
13 Jan.	tissues, organs, organ systems and both 1° & 2° growth	
15 Jan.	More on anatomy and growth – <b>Last D/A</b>	
Lab	Field trip to try to find <i>Macbridea</i> seeds and soil	<b>Add to Google Rept.</b>
17 Jan.	More on anatomy and growth	
20 Jan.	MLK Holiday	
22 Jan.	More on anatomy and growth	
Lab	Set up <i>Macbridea</i> experiments	<b>Google Lab Rept.</b>
24 Jan.	<b>ENERGY</b> – how plants transform solar energy to chemical	5 & 7

<u>DATE</u>	<u>TOPIC</u>	<u>CHAPTER</u>
27 Jan.	energy through photosynthesis, and why this is important	
29 Jan.	Energy, continued – <b>Paper #1 DUE</b>	
	Lab Micro and macro observations on vegetative anatomy	<b>Google Lab Rept.</b>
31 Jan.	Energy, continued	
3 Feb.	<b>EXAM 1</b>	
5 Feb.	<b>WATER</b> – how plants use, obtain and move water and...	4 & 30
	Lab Water field trip	<b>Google Lab Rept.</b>
7 Feb.	...why this is important	
10 Feb.	Water, continued	
12 Feb.	<b>HOW PLANTS “EAT”</b> – plant nutrition and soils	29
	Lab Set up water demonstrations; C4 and CAM carbon capture worksheet	<b>Google Lab Rept. for water, Worksheet</b>
14 Feb.	Plant nutrition and soils, continued	
17 Feb.	Plant nutrition and soils, continued	
19 Feb.	Longleaf pine ecosystem lecture	
	Lab Field trip to see longleaf pine ecosystems	<b>Google Lab Rept.</b>
21 Feb.	<b>SEX&amp;DIVERSITY</b> – evolution of reproductive strategies	12, <b>Worksheet</b>
24 Feb.	Bryophytes	16
26 Feb.	Seedless vascular plants	17
	Lab Campus field trip in search of diversity	<b>Google Lab Rept.</b>
28 Feb.	Review – <b>Paper #2 DUE</b>	
2 Mar.	<b>EXAM 2</b>	
4 Mar.	Gymnosperms	18
	Lab Student presentations on ecological/economic value of plants – <b>this is your graded PowerPoint</b>	<b>Google Sign-up</b>
6 Mar.	Angiosperms	19 – 21
9 Mar.	Angiosperms, continued	
11 Mar.	Angiosperms, continued	
	Lab Micro and macro observation of reproductive structures	<b>Google Lab Rept.</b>
13 Mar.	<b>PLANT REGULATION</b> – internal and external cues – Student presentations begin	2, 27&28 – <b>Google Sign-up</b>
16-20 Mar.	<b>Spring Break!!!</b>	
23 Mar.	Student presentations on plant regulation	
25 Mar.	Guest lecture by Dr. Richard Porcher???	P&R
	Lab Field Trip to Caw Caw Interpretive Center	<b>Google Lab Rept.</b>
27 Mar.	Student presentations on plant regulation	

<u>DATE</u>	<u>TOPIC</u>	<u>CHAPTER</u>
30 Mar.	Student presentations on plant regulation	
1 April	Beech ecosystem lecture	
Lab	Field trip to beech ecosystem	
3 April	Student presentations on plant regulation / review	
6 April	<b>EXAM 3</b>	
8 April	<b>FUNGI – just because! Paper #3 DUE</b>	14
Lab	Student Presentations of Cool Fungi Facts and Videos	<b>Google Sign-up</b>
10 April	Fungi	
13 April	Fungi	
15 April	Lab Review	
Lab	<b>Lab Final</b>	
17 April	Review – these reviews may be used to make up for lost time, and also to make sure lab reports are complete	
20 April	Review	
22 April	Review	
Lab	No lab; this counts as a Monday	
<b>24 April</b>	<b>Comprehensive Final Exam – 4-7pm</b>	

## TENTATIVE LAB SCHEDULE

<u>DATE</u>	<u>LAB TOPIC</u>
8 Jan.	Discover student interests; plan <i>Macbridea</i> experiment – <b>Google Lab Report</b>
15 Jan.	Field trip to search for <i>Macbridea</i> seeds; collect soil (keep notes for later report)
22 Jan.	Set up <i>Macbridea</i> experiment – <b>Google Lab Report</b>
29 Jan.	Micro and macro observations on vegetative anatomy – <b>Google Lab Report;</b> <b>Paper #1 DUE in class or at the beginning of lab</b>
5 Feb.	Water field trip – <b>Google Lab Report</b>
12 Feb.	Set up water experiments; C4 and CAM carbon capture worksheet – <b>Google Lab Report on Water Experiments</b>
19 Feb.	Field trip to see longleaf pine ecosystems – <b>Google Lab Report</b>
26 Feb.	Campus field trip in search of diversity – <b>Google Lab Report</b>
4 Mar.	Student presentations on ecological/economic value of plants – <b>Google sign-up</b>

11	Mar.	Micro and macro observation of reproductive structures – <b>Google Lab Report</b>
18	Mar.	Spring Break
25	Mar.	Field Trip to Caw Caw Interpretive Center – <b>Google Lab Report</b>
1	April	Field trip to beech ecosystem – <b>Google Lab Report</b>
8	April	Student Presentations of Cool Fungi Facts and Videos – <b>Google sign-up; Paper #3</b> <b>DUE in class or at the beginning of lab</b>
15	April	<b>Lab Final</b>

**INDOOR LABS:** Information about the labs will generally be posted on OAKS before each lab. You are responsible for being fully prepared, and there may be quizzes.

**FIELD TRIPS:** We will have several off-campus field trips that will take us out in the woods, so dress to get wet, dirty, wet, buggy, wet, scratched, wet, muddy, wet, and wet. **BE PREPARED!** I strongly recommend that you wear long sleeves, long pants, and old shoes or rubber boots. **YOU MUST WEAR CLOSED SHOES** (no Teva's, Crocs or other sandals). If you do not wear closed shoes to field labs, you will be dismissed from that lab, as an unexcused absence. Consider a hat and/or sunscreen, and you may want bug spray (**no** bug spraying in the van!). You should bring plenty of water and perhaps a snack.

**YOU MIGHT WANT TO INVEST IN A HEAD NET – THE MOSQUITOES BE FEROCIOUS!**

**Please note:** You **must** wear your seatbelt at all times when riding in the van, and no one will sit in the back seat if there are free seats to the front. These are safety issues and non-negotiable. There will be **no** smoking, **no** vaping and **no** cell phone or other electronic communication device use (other than for imaging) on our field trips. If you smoke, please do not smoke right before getting in the van. These restrictions are also non-negotiable.

**If you are allergic to bee stings or other venoms, please let me know immediately. You must carry medication. If you are diabetic, please set up a buddy system with a classmate.**

Some field trips may run late due to unpredictable traffic. Please schedule accordingly, and please let me know as soon as possible if late field trips are going to be a problem for you.