

## **BOT 4851C: Medical and Forensic Plant Biology**

Fall 2019

### **Catalog Description**

Basic plant taxonomy, systematics, phytochemicals, uses of plants by animals and various human cultures, and in the development of modern medicine and drug development. Uses of plant tissues and products in forensic investigations will also be discussed.

### **Credit Hours: 3**

**Pre-requisites and Co-requisites:** BSC 2011, minimum grade of B (or corresponding AP credit)

**Course Objectives:** By the end of the course, students will be able to do the following:

- Describe the basic structures of a plant and functions of the major plant organs
- Describe the tissue types of plants and how they are used in medicine and forensics
- Describe the major types of compounds and chemicals plants produce, what their roles are in the plants, and how they have been co-opted for use by humans
- Discuss the early history of modern medical science and the role of plants in medicine
- Describe the ways in which plants have been used medicinally throughout human history
- Discuss medical uses of plants in different human cultures at different times
- Describe major classes of drugs that are derived from plants, and how they were discovered
- Explain how plants can be used in crime scene investigations
- Discuss major historical cases where plants played a key role in forensic science
- Evaluate scientific literature and examine conclusions and findings
- Evaluate claims about drugs and whether they have a scientific basis

### **Instructor Information**

Name: Dr. Emily Sessa  
Office location: Bartram 521A  
Office hours: by appointment  
E-mail address: [emilysessa@ufl.edu](mailto:emilysessa@ufl.edu)  
Website: <http://sessalab.biology.ufl.edu>

### **Teaching Assistant Information:**

Name: Cody Howard  
Office location: Dickinson Hall  
Office hours: By appointment  
E-mail address: [cchoward@ufl.edu](mailto:cchoward@ufl.edu)  
Website: <http://www.codycoyotee.com>

### **Course Meeting Times and Locations**

Mondays and Wednesdays, 10:40–12:35 (periods 4 and 5),  
Rolfs Hall, room 114

### **Course Website**

All course materials and related information (including all required readings) will be posted on the course E-Learning (Canvas) website at <http://lss.at.ufl.edu>. You are responsible for all announcements made in class and/or posted on the course website for this course.

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## Grading

There will be no curve applied to grades for any assignments, or to final course scores.

Discussion participation (8 x 25 pts)	200	A	540 and above	C	420–443
Debate participation and writeup (2 x 50 pts)	100	A-	522–539	C-	402–419
Traditional medicine presentation (1 x 50 pts)	50	B+	504–521	D+	384–401
Lab activities/worksheets (200 pts total)	200	B	480–503	D	360–383
Final crime scene analysis writeup (1 x 50)	50	B-	462–479	D-	342–359
<b>Total</b>	<b>600</b>	C+	444–461	E	341 and below

\*Note that a “C-” will not be a qualifying grade for critical tracking courses. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. For more information on grades and grading policies, please visit: <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

## Description of grade components

- 1. Paper discussions (25 pts each).** We will use the Jigsaw format to discuss three papers. Each student is responsible for becoming an expert on one paper before coming to class, discussing it with other students who also read that paper, and then reporting back to another group of students who read a different paper. Grades for the discussions will be based on participation (15 pts) and a 1-2 paragraph summary of the discussion that should be turned in before the end of class the same day (10 pts). Nine discussions are scheduled, the highest eight grades will count.
- 2. Debates (50 pts each).** Debate grades includes three parts:
  - (15 pts) Submit **1-page** summary of your “side” in the debate - what are your arguments, and how do you anticipate responding to the other side? Citations supporting your argument must be included on a second page (minimum of three, carefully chosen!). Assignment must be turned in on Canvas before the debate.
  - (20 pts) Participate in the debate itself.
  - (15 pts) Submit a **1-page** summary of the debate. How did the major arguments differ from what you expected going in? Who do you think won and why? What follow up points do you have in favor of your argument, or were you convinced by the other side? Assignment is due through Canvas before the start of the next class period.
- 3. Traditional medicine presentation (50 pts).** Each student will choose one culture or tribe, contemporary or historical, and investigate how the members of that group used plants medicinally. What are or were the major important plants they use/d, how did plants figure into their religion or mythology, who is/was responsible for knowledge about medicinal plants, how was this knowledge passed on, what is the relationship with modern medicine, etc. Each student will give a 10 minute presentation in class, with slides, that describes their findings.
- 4. Lab worksheets (20 pts each).** Several of the labs have worksheets or write-ups associated with them. These are due either at the end of class, or before the start of the next class period. Twelve are scheduled, the highest ten grades will count.
- 5. Final “crime scene” analysis (50 pts).** The class final is in the form of a crime scene, where students are responsible for using what they’ve learned in the forensics portion of the class to solve a mystery. This will be scheduled during one of the university-assigned final exam times. Each student is responsible for analyzing the evidence and submitting their solution to the crime.

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### **Guidelines for Written Assignments**

The following rules apply to ALL of the written assignments listed above (pre- and post-debate summaries, paper discussion summaries, , etc.):

- Each must be typed in 12 point font with 1.5 line spacing.
- Grammar and spelling will be considered in your grade. Please edit your work!
- When applicable, cited works must follow MLA style.

### **Attendance & Make-up Policy**

Students are expected to be on time for class, as a courtesy to the instructors and other students. Attendance is required and is essential for success in this class. In-class activities will differ day to day, but will emphasize participation and group work. Missing classes will therefore hurt your ability to learn the material covered in the course. If you need to miss a class, please email Dr. Sessa as soon as you know you will be absent so that arrangements can be made for you to make up the material. This will generally involve completing an alternate assignment for a proportion of the original points (e.g., 80% or 90%). If absences continue, that proportion will drop, unless you provide acceptable documentation for an extended absence (e.g., doctor's note for hospital treatment).

If you know you will be absent for **religious or athletic reasons**, that's fine, but you must alert the instructors at least one week in advance (preferably give us your schedule of known absences within the first two weeks of the semester). The policies for allowable absences and make-up work follow the university attendance policies: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>. The student is responsible for scheduling any make-up work with the instructor.

### **Conduct in Class**

Please be courteous and do not talk during lecture. This can be distracting to other students and the instructor. Only approved electronic devices may be used in class. Approved electronic devices are laptop computers (when used to take notes or otherwise participate in classroom activities) and voice recording devices. Unapproved electronic devices include cell phones, video recorders, digital cameras and MP3 players. If you use these devices you may be asked to leave. Please note that it's very obvious to instructors when you are using these devices for socializing during class.

### **UF Counseling Services**

Your well-being is important to everyone at the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Resources are available on-campus for students who are struggling or lacking clear academic and career goals. The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological/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/>.

## 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: <http://www.dso.ufl.edu/judicial/procedures/academicguide.html>.

## Plagiarism

Plagiarism is a serious violation of the honor code and will be taken extremely seriously. It can result in a failing grade on the assignment and/or for the entire course, report to the Dean of Students Office, and potentially expulsion from the University of Florida. Please make sure you understand what plagiarism is; often students do not fully understand what kinds of activities will be considered plagiarism. These include, but are not limited to:

- Failing to cite sources, or citing them improperly
- Submitting all or part of someone else's work as if it is your own
- "Borrowing" or copying lines without crediting the source
- Submitting duplicate assignments
- Collaborating or receiving substantial help in writing your assignment

It is **incredibly obvious** when you have copied material directly from the internet. We will know if you have done this.

## Accommodation 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/drp/services/>.
- 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.
- The student should provide official documentation of a requirement for accommodation to the instructor by the **second week of class**.

## Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester. You will be notified by email of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu>.

### **U Matter, We Care**

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### **Basic Needs and Security**

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, is urged to contact the Dean of Students for support (<https://dso.ufl.edu>). Please also notify your professor if you are comfortable in doing so.

UF has a food pantry on campus (located near the HUB) that is available to all students. No proof of need is required; all you need is a UF ID card. Field & Fork Food Pantry: <https://pantry.fieldandfork.ufl.edu/>

## Course Outline

Week	#	Day	Date	Topic
1	1	W	8/21	Welcome, introductions, Jigsaw example
2	2	M	8/26	Lecture: Plant form and function (organs, vegetative, floral, fruit structures) Lab activity: Plant morphology, flower morphology, etc. ( <b>worksheet 1</b> )
	3	W	8/28	Lab activity: Supermarket botany and plants used in a day ( <b>worksheet 2</b> )
3	—	M	9/2	<b>Labor Day - no class</b>
	4	W	9/4	Lecture: Plants and the history of botany; case study: birth control! Jigsaw 1 - Plant phylogeny and traditional medicine
4	5	M	9/9	Lecture: Phylogeny, doctrine of signatures, classification systems Lab activity: Great Clade race, Tree Thinking quiz 1
	6	W	9/11	Lecture: Overview of plant systematics, with examples from major groups in lab Lab activity: Overview of angiosperms ( <b>worksheet 3</b> )
5	7	M	9/16	Lecture: Plant evolution and plant defenses; overview of major phytochemicals Jigsaw 2 - Plant defenses
	8	W	9/18	Lab activity: Plant defense lab ( <b>worksheet 4</b> )
6	9	M	9/23	Jigsaw 3 - Zoopharm, birds Time for debate planning
	10	W	9/25	Lecture: Phytochemicals, Terpenoids Lab activity: Plant families related to today's lecture topics ( <b>worksheet 5</b> )
7	11	M	9/30	Jigsaw 4 - Zoopharm, primates Time for debate planning
	12	W	10/2	Lecture: Phytochemicals, Phenolics Lab activity: Plant families related to today's lecture topic ( <b>worksheet 6</b> )
8	13	M	10/7	Debate: Medical marijuana
	14	W	10/9	Lecture: Phytochemicals, Alkaloids Lab activity: Plant families related to today's lecture topic ( <b>worksheet 7</b> )
9	15	M	10/14	Jigsaw 5 - ETOH Time for debate planning
	16	W	10/16	Lecture: Phytochemicals, Glycosides Lab activity: Plant families related to today's lecture topic ( <b>worksheet 8</b> )
10	17	M	10/21	Jigsaw 6 - Psychoactive plants Time for debate planning
	18	W	10/23	Lecture: Poisons derived from plants Lab activity: Plant families related to today's lecture topic ( <b>worksheet 9</b> ) <b>Note: Today is the day to confirm your presentation topic!</b>

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<b>11</b>	<b>19</b>	M	10/28	Debate - Bioprospecting
	<b>20</b>	W	10/30	Jigsaw 7 - Doubleblind
<b>12</b>	<b>21</b>	M	11/4	Botanical Roleplay: ER doctor/patient
	<b>22</b>	W	11/6	Lecture: Drug development from medicinal plants: aspirin, taxol, digitalis, ephedra Lab activity: Plant families related to today's lecture topic ( <b>worksheet 10</b> )
<b>13</b>	—	M	11/11	<b>Veteran's Day - no class</b>
	<b>23</b>	W	11/13	Jigsaw 8 - Health benefits of supplements
<b>14</b>	<b>24</b>	M	11/18	Student presentations - traditional uses of plants in various cultures
	<b>25</b>	W	11/20	Student presentations - traditional uses of plants in various cultures
<b>15</b>	<b>26</b>	M	11/25	Lecture: Case studies in forensic botany: overview and examples Jigsaw 9 - Methods in forensic botany
	—	W	11/27	<b>Thanksgiving - no class</b>
<b>16</b>	<b>27</b>	M	12/2	Lecture: Plant ecology, functional groups of plants and in landscapes Lab activity - wood anatomy ( <b>worksheet 11</b> )
	<b>28</b>	W	12/4	Lecture: pollen analysis (palynology) and other microscopic analyses Lab activity - palynology, "stomach contents" (fruits and other parts macerated) ( <b>worksheet 12</b> )
<b>Final</b>		T	12/10	Final: Putting it all together - Crime Scene Analysis

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