

**Emory University**  
**HLTH 485 / BIOL 485: Botanical Medicine and Health**  
TuTh 2:30-3:45pm  
Anthropology Building, Room 303

**Course Description:** Mankind has long recognized that plants are extremely useful as a source of medicine. Medical traditions based on botanical drug sources can be found in all human cultures and date back to prehistory. In this course, both ancient and modern day botanical traditions across many cultures will be discussed as they pertain to medicine. The pathways through which natural drugs are made by plants and how they affect humans will be the focus of this class. Some examples include botanical drugs for infectious disease, cancer, cardiovascular health, dental health, central nervous system function, and much more. By the end of this course, you will have a solid understanding of the major botanical drugs, including their sources, applications, and cultural relevance.

**Instructor:** Cassandra L. Quave, Ph.D.

**Credits:** 3 credit units

**Required Text:**

- Medical Botany: Plants Affecting Human Health. (2003) Walter H. Lewis and Memory P.F. Elvin-Lewis (2nd Edition) ISBN 978-0471628828

**Optional Text:**

- Fundamentals of Pharmacognosy and Phytotherapy. (2012) M. Heinrich, J. Barnes, S. Gibbons, E. M. Williamson. ISBN: 9780702033889

**Other Resources:** [TeachEthnobotany YouTube Channel](#) ; [Dr. Quave's website](#)

**Course Requirements:**

1. As a student in this course, it is expected that you will actively participate in each class and complete assignments on time. Assignments are due no later than the assigned due date. If you have technical or personal computer difficulties, you are expected to use the Emory computer work stations or seek Emory computer technology assistance. Late assignments will NOT be accepted, and you will receive a zero for any missing or late work.
2. Hard (paper) copies of appropriate documentation for class absences or late assignments due to medical emergencies must be turned in to Dr. Quave within 72 hours of the absence or missed assignment. Submission of documentation by email is not acceptable unless specifically approved in writing by Dr. Quave.

**Contact Information**

Office: Center for the Study of Human Health, Candler Library, Rm. 107E

Office hours: Wednesdays 10am-noon

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**Course Procedures:**

**Dropping a Course:** Emory students may withdraw from one or more courses until the Friday at 4pm of the sixth full week of class of the semester after the drop-add period providing that the student continues to carry a load of 12 credit hours or is in his/her final semester of residence as a graduating senior. Please consult your advisor or the Office for Undergraduate Education

**Disability:** Emory University is committed to ensuring that all University goods, services, facilities, and programs are meaningfully accessible to eligible persons with a disability in accordance with the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act 1973, and other pertinent federal, state, and local laws. The Office of Disability Services (ODS) is the central clearinghouse that processes and facilitates all accommodation requests from qualified students who have completed the registration process in its entirety. Students are responsible for initiating the accommodation request process by self-disclosing their disability and/or chronic medical condition directly to ODS. More detailed information is available on the website at [www.ods.emory.edu](http://www.ods.emory.edu), or make requests directly to the

**Academic Honesty Policy:** For more than half a century, academic integrity has been maintained at Emory through the student-initiated and student-regulated Honor Code. The responsibility for maintaining a standard of unimpeachable honor in all academic work falls upon every individual who is a part of Emory University. Every student who chooses to attend Emory College agrees, as a condition of attendance, to abide by all provisions of the Honor Code as long as he or she remains a student in the college. By continued attendance in Emory College, students reaffirm their pledge to adhere to and uphold the provisions of the Honor Code. The Honor Council, a body of at least ten annually appointed students, has responsibility for investigating and adjudicating all alleged violations of the Honor Code. Students found to have violated the Honor Code are subject to verbal reprimand, written reprimand, F in the course in question, suspension, dismissal, or a combination of these and other sanctions. Copies of the Honor Code are distributed and explained to new students and are available in the Emory College office, 218 White Hall, and online at [http://www.college.emory.edu/current/standards/honor\\_code.html](http://www.college.emory.edu/current/standards/honor_code.html).

**In this class, the Emory University honor code** is in place and you are explicitly responsible for taking care to present work that you claim as your own: there is a *no tolerance policy* in effect for *plagiarism* from any source, inclusive of internet sites, and the written and spoken work of others. If you do not understand what plagiarism is, please read the honor code carefully and seek assistance from the instructor.

### Course Expectations and Objectives:

Students in this course are expected to be active learners and participants, requiring all students to take an active role in their own learning and to share the learning process with the class. Evidence of active learning includes:

- ◆ *“Attending” all lectures*, which is critical to promoting a learning community within the class.
- ◆ *Reading all assigned materials* and making note of questions, areas of interest, and connections you find to other readings.
- ◆ *Active participation*, allowing each student to test his or her own assumptions as well as expand the worldview of others in the class.

### Graded Assignments:

In addition to the ongoing participation in online discussions, there will be a series of homework assignments and quizzes posted on blackboard. Be sure to check the list of tasks and reading assignments for each module to assure that you have completed all assignments. As a general rule, the regular assignments (short quizzes, discussion posts, homework) are due by midnight of the end of the week (Sunday) for which the assignment is posted in. Plan ahead in order to avoid complications in assignment submission. You may wish to look ahead to future modules to ensure that you can plan appropriately to complete all assigned work. Besides these assignments, you will have a midterm and final exam.

### Blackboard

You are responsible for checking the course blackboard site on a regular basis. All of your reading assignments, video content, quizzes, discussion topics, lecture slides, and class assignments are available on the course BB site. Important information and announcements will also be posted in BB. With the exception of your exams, all assignments and assessments will be submitted through BB.

### Course Grading Categories

The average of points earned from regular course assignments will make up 30% of your final grade. Each exam will make up 35% of your final grade.

- Class Assessments/Assignments (30%)
- Midterm Exam (35%)
- Final Exam (35%)

There will be bonus opportunities available during the course and will count towards your Class Assessment/Assignment portion of your final grade, not to exceed the 30% allowable for this grade portion. These will be announced during class. Examples include attendance at specific film events and a class tour of the Atlanta Botanical Gardens.

### Grading Scale by Percent

Letter Grade	Percent
A	≥ 94%
A-	90-93%
B+	86-89%
B	83-85%
B-	80-82%
C+	76-79%
C	73-75%
C-	70-72%
D	60-69%
F	≤59%

## Course Schedule

Date	Topic
<b>History and Introduction to the Field</b>	
January 13	History of botanical medicine and healthcare
January 15	Cultural interactions with spices and herbs
January 20	Plants and drug discovery
January 22	Natural products chemistry: major classes of medically relevant compounds
January 27	Dangerous Herbs: Poisons
<b>Remedial Plants</b>	
January 29	Cancer
February 3	Musculoskeletal System
February 5	Nervous System
February 10	Cardiovascular System
February 12	Respiratory System
February 17	Endocrine System
February 19	Urogenital System
February 24	Gastrointestinal Tract
February 26	Oral Health and Hygiene
March 3	Sensory Organs (eye and ear)
March 5	<b>Midterm Exam</b>
March 10	<b>Spring Break</b>
March 12	<b>Spring Break</b>
March 17	Skin
March 19	Infectious Disease
<b>Psychoactive Plants</b>	
March 24	Hallucinogens
March 26	Stimulants
March 31	Depressants
<b>Perspectives in Health Research</b>	
April 2	Safety and efficacy issues associated with herbal products in the USA
April 7	Phytochemistry in contemporary drug discovery <b>Guest Lecture:</b> James T. Lyles, PhD
April 9	African ethnobotany and conservation <b>Guest Lecture:</b> Paul Blackmore, MS
April 14	Kosovar ethnobotany and essential oils <b>Guest Lecture:</b> Avni Hadjari, PhD
April 16	Chemical ecology and botanical medicines for butterflies <b>Guest Lecture:</b> Jaap de Roode, PhD
April 21	Herbaria and natural history collections <b>Guest Lecture:</b> Jane E. Bradbury, PhD
April 23	Research ethics: Bioprospecting vs. biopiracy
TBA	<b>Final Exam</b>

## Course Learning Objectives

### Core Competencies:

At the completion of this course, students will be able to:

- List, describe, and differentiate between different classes of medically relevant botanical natural products.
- Create conceptual chemotaxonomic links concerning natural products and botanical families.
- Explain the mechanistic basis of action for botanical natural products in numerous body systems.
- Reflect on the human-nature interface as it relates to medicinal plant use in various cultures.

### Specific Competencies:

At the completion of this course, students will be able to:

1. List some of the pure chemicals isolated from plants in the 19th and 20th centuries (morphine, quinine, salicin, atropine, caffeine, coniine, emetine, strychnine, tubocurarine).
2. Recognize the primary historical medical botanists (Pedanius Dioscordies, Li Shizen, Avicenna, Hippocrates) and some of the historical botanical records (Ebers Papyrus, Corpus Hippocraticum, De Materia Medica).

3. Describe some of the ancient uses of spices.
4. Discuss the relationship between the spice trade and the European Renaissance.
5. Explain the influence of the nutmeg trade on European culture and culture of the Banda islands.
6. Compare and contrast CAM with allopathic medical practices.
7. Provide examples of ethnobotanical studies that have led to the discovery and development of Western pharmaceutical medicines.
8. Describe the ethnobotanical approach to drug discovery and debate the merits of this approach in comparison to others.
9. List the major classes of medically relevant natural products from plants and provide examples of specific medically relevant compounds from each class.
10. Explain what plant secondary metabolites are and why/how plants make them.
11. Discuss how indigenous people use sensory clues from plants to understand the plant chemistry and potential for medicinal value.
12. Describe mankind's history with poisonous plants (in particular, ways in which we have used or modified plants with poisonous characters).
13. List the main classes of poisonous plant compounds.
14. Recognize symptoms associated with the toxidromes associated with different classes of poisonous plant compounds.
15. Explore the link between diet and cancer and why some edible plants have protective effects against cancer.
16. Discuss some of the chemopreventive uses of plants in the form of foods and botanical supplements.
17. List the main anti-cancer drugs (therapeutic agents) derived from plants, their historical use in traditional medicine, the types of cancer they are used to treat and the basic concepts behind their mechanism of action.
18. Recall some of the important plant-derived musculoskeletal drugs and describe their mechanism of action.
19. Recall some of the important plant-derived drugs that impact the nervous system and describe their mechanism of action.
20. Recall some of the important plant-derived cardiovascular drugs and describe their mechanism of action.
21. Recall some of the important plant-derived respiratory drugs and describe their mechanism of action.
22. Recall some of the important plant-derived endocrine system drugs and describe their mechanism of action.
23. Recall some of the important plant-derived drugs that impact the urogenital tract and describe their mechanism of action.
24. Recall some of the important plant-derived drugs that impact the gastrointestinal system and describe their mechanism of action.
25. Recall some of the important plant-derived drugs that impact oral health and describe their mechanism of action.
26. Recall some of the important plant-derived drugs that impact sensory organs and describe their mechanism of action.
27. Recall some of the important plant-derived drugs that impact the skin and describe their mechanism of action.
28. Recall some of the important plant-derived drugs for the treatment of infectious disease and describe their mechanism of action.
29. List some of the most widely used stimulant plants around the globe and describe their mechanism of action.
30. Describe the role of stimulant plants in different cultures.
31. List some of the most widely used depressant plants around the globe and describe their mechanism of action.
32. Describe the role of depressant plants in different cultures.
33. List some of the most widely used hallucinogenic plants around the globe and describe their mechanism of action.
34. Describe the role of hallucinogenic plants in different cultures.
35. Differentiate between endogenous and exogenous antioxidants and explain how dietary interventions with plants can impact human health.
36. Debate the strengths and weaknesses of conservation initiatives concerning threatened medicinal plant species.
37. Reflect on the role of ethics in ethnobotanical research and describe some of the international legislation that provides a framework for ethical research with indigenous populations.
38. Describe the key issues related to safety and efficacy of dietary botanical supplements sold in the US.
39. Compare the role of medicinal plants in household healthcare in different cultures (i.e. Cameroon vs. Kosovo)
40. Explain the role and importance of herbaria and natural history collections in ethnobotanical and natural products research.