

Introduction to Medicinal Plants

ORH4932, 2 credits

Fall 2021

Meeting date, time, and place: 50min lectures on Wed, Fri from 10:40-11:30 am in PSF5

Prerequisites: None

Instructor: Dr. Swathi Nadakuduti

Environmental Horticulture Department

1519 Fifield Hall, University of Florida

s.nadakuduti@ufl.edu; (352)-273-4575

Office hours – Immediately after the class every Wed and Fri until 12:30pm. Other appointments can be made on an individual basis.

TA: Blake Costine (blakec1@ufl.edu), graduate student, ENH department. Office hours – Tues and Thurs from 9:00-10:00am, 1302 Fifield Hall. Other appointments can be made as needed.

Guest lectures:

Dr. Bart Schutzman, Environmental Horticulture Dept

Dr. Sandy Wilson, Environmental Horticulture Dept

Dr. Celina Gomez, Environmental Horticulture Dept

Dr. Brian Pearson, Environmental Horticulture Dept

Dr. Wagner Vendrame, Environmental Horticulture Dept

Dr. Yousong Ding, Dept. of Medicinal Chemistry, College of Pharmacy

Hands-on-activities:

Erin Alvarez, Swathi Nadakuduti - Environmental Horticulture Dept

Course description:

“Introduction to medicinal plants” surveys series of plants across the globe used in traditional and modern medicines and/or diets to improve human health. We will focus on aspects related to ethnobotany and chemistry at a basic level for non-experts and discuss about the scientific evidence and research underlying some of the plant-derived drugs. We will also learn about basics of plant metabolism, botany, nomenclature and taxonomy of medicinal plants and various guest lectures on medicinal plant research at University of Florida. The class will be structured to include lectures, interactive classroom discussions, experiencing live plants we are studying about, propagating selected medicinal plants and making simple herbal preparations. Our learning experience will conclude with a tour of medicinal plants around UF main campus and plants used in research in UF/IFAS.

Course learning objectives: Students from this course will be able to:

1. Survey the medicinal plants used in traditional and modern medicine.
2. Evaluate recent research and development in medicinal plants and justify the use of herbal preparations and risks involved.
3. Identify the ethnobotanical use of plants and tissues for isolation of bioactive compounds.
4. Define primary and specialized metabolism in plants and recognize how humans have harnessed chemical diversity in plants.
5. Summarize basics of isolation, purification, and Identification of medicinal compounds.
6. Analyze the ethical framework to herbal medicine
7. Explore application of plants as medicine through class lectures, paper presentations and discussions, looking to the future of medicines from plants.

Introduction to Medicinal Plants

Lec Wk	Lecture Topic
25-Aug	Introduction to Medicinal plants course
27-Aug	Why study plants? prospects in medicinal plant research
1-Sep	Harnessing chemical diversity of plants
3-Sep	Nomenclature and botany of medicinal plants and plant parts for medicinal use
8-Sep	Plant taxonomy and phylogenetic relationships – Dr. Bart Schutzman, ENH
10-Sep	Ethnobotanical use of plants - Historical perspectives of medicinal botany based on plant origins
15-Sep	Basics of plant metabolism for human use + Quiz 1
17-Sep	Phytochemicals from plant primary vs. secondary metabolism
22-Sep	Biosynthesis of plant derived natural products for human medicine - Natural product classes and examples
24-Sep	Herbal remedies quality control, dosage, safety, and efficacy
29-Sep	Hands on activity I - Antibacterial properties of plant extracts
1-Oct	<i>Tour of ethnobotanically significant plants, discussion of the current and historical role of medicinal plants in public gardens – Erin Alvarez/Dr. Bart Schutzman, ENH</i>
6-Oct	Mid-term Exam
8-Oct	Holiday - Homecoming
13-Oct	Survey of native plants in Florida for medicinal use - Dr. Sandy Wilson, ENH
15-Oct	Medicinal plants for pain relief as analgesics
20-Oct	Medicinal plants promoting digestive and skin health
22-Oct	Medicinal plants with anti-cancer properties + Quiz 2
27-Oct	Medicinal plants for respiratory and cardiovascular health
29-Oct	Medicinal plants for boosting immunity, joints, and muscles
3-Nov	Aromatic plants for essential oils
5-Nov	Environmental impact on plant natural product accumulation and “Biopharming”
10-Nov	Overview of isolation, purification, and Identification of medicinal compounds - Dr. Yousong Ding - Dept. of Medicinal Chemistry, College of Pharmacy
12-Nov	Hands on activity II – propagate medicinal plants (take home a plant) - Erin Alvarez
17-Nov	Challenges in using plants as medicines and ethical framework to herbal medicine - Nagoya protocol + Quiz 3
19-Nov	Hands on activity III – herbal preparations in class + Research paper submission
24-Nov	Thanksgiving Holiday
26-Nov	Thanksgiving Holiday
1-Dec	Medicinal plants research at UF - Ginger, turmeric - Dr. Celina Gomez, ENH
3-Dec	Medicinal plants research at UF – Kratom, Cannabis - Dr. Brian Pearson, ENH
8-Dec	Medicinal plants research at UF - Saw Palmetto, Skullcap - Dr. Vendrame, Dr. Nadakuduti, ENH
10-Dec	Reading Day
13-Dec	Final Exam

ENH Optional textbooks: Lecture notes and the pdf copy of Handbook of medicinal herbs (Duke, James A., 1929-2017; ISBN 0-8493-1284-1) **WILL** be provided by the instructor.

Plants That Cure: Plants as a Source for Medicines, from Pharmaceuticals to Herbal Remedies by Elizabeth A. Dauncey (Author), Plants that Cure Melanie-Jayne R. Howes (Author) ISBN-978-0-691-20018-7

Handbook of medicinal plants c2005 (Bachrach, Uriel.; Yaniv, Zohara. ISBN-13: 978-1560229957)

Evaluation and Grade determination:

Assignment#1 (20 points) Write a research report on a selected medicinal plant with information related to the botany, horticulture, biology, and relationship to human health. Each paper must include an in-depth scientific literature review to support or argue the use of the plant product for medicinal purpose by critical analysis of literature. Research reports are 4-5 typed pages, including illustrations (excluding references). Research papers will be graded on the overall quality of the paper and the current literature cited. Students are expected to work independently to complete reports. A list of medicinal plants will be given to choose from, or the student may choose a medicinal plant and research on it. Further instructions will be given in the class on how to prepare your research report.

Hands-on-activity I and II Reports (7.5 points each): Submit a report (following week after the activity) on the first two hands-on-activities to include: description of objectives for the activity, materials and methods used, observations from the activity and interpretation of results.

Quizzes#1-3 (5 points each) In-class quiz will be for 15 min before the lecture, consisting of multiple-choice questions and fill in the blanks on the content covered.

Mid-term and Final exams (25 points each) questions will be drawn from lectures and discussions). There will be brief review sessions before the exams.

#Points	Passing Grade	Grade points
96-100	A	4.0
91-95	A-	3.67
87-90	B+	3.33
83-86	B	3.0
79-82	B-	2.67
75-78	C+	2.33
72-74	C	2.0
69-71	C-	1.67
66-68	D+	1.33
63-65	D	1.0
60-62	D-	0.67
<60	E	0.00

For information on current UF policies for assigning grade points, see:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Class Policies that students MUST follow:

Attendance: Your attendance at all classes is a strong expectation, but if you are ill or an emergency occurs, contact your instructor PRIOR TO the scheduled class time. Make up quizzes

and assignments will be allowed ONLY when a document of support for emergencies is provided. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies which can be found at <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

"At the University of Florida, we have an obligation to each do our part to prevent further transmission of COVID-19. Medical experts say vaccination and masking are the best ways to support the health and safety of our campus community. Effective immediately, in light of new guidance from the Centers for Disease Control and Prevention, the University of Florida expects everyone to wear a mask at all times when inside any UF facility, even if you are vaccinated. This includes all students, faculty, staff, and visitors. As such, all students, faculty, staff and visitors attending our class are expected to wear a mask at all times as long as we are meeting inside."

Late Assignments: Assignments will NOT be accepted after the due date. If communicated ahead of time, late assignments may be considered with a late penalty of 25%.

Makeup Exams: Special permission is required ahead of time to accommodate makeup exam. This will be made possible under reasonable circumstances.

Expectations for classroom behavior: Please do not talk privately during the lectures or multitask (i.e. doing work for other courses or research, using your computer, cell phone or other electronic devices for web surfing or email). Ask questions and be involved in the class.

COVID Response Statements:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Online Course Evaluation Process:

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at: <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email, they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at: <https://gatorevals.aa.ufl.edu/public-results/>. students will be given specific time in the class to fulfill this requirement.

Academic Honesty:

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: “*On my honor, I have neither given nor received unauthorized aid in doing this assignment.*” It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

** Please DO NOT borrow the writing of others – this is called Plagiarism. If you do not understand what this means, ask your instructor to clarify. If you are presenting others’ thoughts or writing including diagrams/pictures you must cite them. Instructors will do the same!

In-Class Recording:

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. ***A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student.***

Software Use:

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Services for Students with Disabilities:

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services, and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/get-started/>

Campus Helping Resources:

Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352-392-1575 so that a team member can reach out to the student. Dean of Students Office (CARE team) <https://care.dso.ufl.edu/>

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc> 352-392-1575

Sexual Assault Recovery Services (SARS) Student Health Care Center, 352-392-1161

University Police Department at 352-392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website <https://shcc.ufl.edu/>

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website <https://ufhealth.org/emergency-room-trauma-center>

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website <https://gatorwell.ufsa.ufl.edu/> or call 352-273-4450

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learningsupport@ufl.edu. <https://lss.at.ufl.edu/help.shtml>

Career Connections Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <https://teachingcenter.ufl.edu/>

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <https://writing.ufl.edu/writing-studio/>

Student Complaints

Residential Course: <https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code/>

Online Course: <http://www.distance.ufl.edu/student-complaint-process>

University of Florida Complaints Policy

The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy.

A student who is unsure as to the official responsible for handling his or her particular complaint may contact the Ombuds office or the Dean of Students Office. For complaints that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are encouraged to submit those complaints to one of the following locations: Ombuds: <http://www.ombuds.ufl.edu/> 31 Tigert Hall, 352-392-1308

The purpose of the Ombuds office is to assist students in resolving problems and conflicts that arise in the course of interacting with the University of Florida. By considering problems in an unbiased way, the Ombuds works to achieve a fair resolution and works to protect the rights of all parties involved. Dean of Students Office: <http://www.dso.ufl.edu/> 202 Peabody Hall, 352-392-1261

The Dean of Students Office works with students, faculty, and families to address a broad range of complaints either through directly assisting the student involved to resolve the issue, working with the student to contact the appropriate personnel, or referring the student to resources or offices that can directly address the issue. Follow up is provided to the student until the situation is resolved. Additionally, the University of Florida regulations provide a procedure for filing a formal grievance in Regulation 4.012: <http://regulations.ufl.edu/regulations/uf-4-student-affairs>