HOS3513C - Breeding and Production of Medicinal Plants and Herbs

Spring, 2026
Course Format (In-person for Section 1, Section 2, and Section 3; Hybrid for Section 4), Number of Credits: 2
Class time and location: Monday and Wednesday 9th Period (4:05 pm – 4:55 pm), Lynn Blueberry #154

Instructors

Dr. Jeongim Kim (Section 1, coordinator)
Horticultural Sciences Department, Fifield Hall #1111,
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Office Hour: Monday 2 pm - 4 pm

Dr. Keun Ho Cho (Section 2)
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Office Hour: Monday 2 pm - 4 pm

Dr. Tie Liu (Section 3)
Horticultural Sciences Department, Fifield Hall #1213,
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office) 846-2638
Office Hour: Tuesday 3 pm - 5 pm

Dr. Anuj Sharma (Section 4)
Horticultural Sciences Department, GCREC Balm,
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office) 813-419-6607
Office Hour: Tuesday 2pm -4 pm *via* zoom
Link: https://ufl.zoom.us/j/92795292787?pwd=EdycXVpZDfyt4fFnSFaLJrJeT2HFU8.1
Meeting ID: 927 9529 2787
Passcode: 456789

Course Description

This course focuses on current and emerging breeding and cultivation practices used to produce high–value medicinal plants and herbs. Additionally, this course provides a critical analysis of health effects and therapeutic claims of plant-derived physiologically-active products.

Course Learning Objectives

Upon successful completion of this course, students will be able to:

- Discuss history and future perspectives of medicinal plants and herbs
- Explain breeding strategies for medicinal plants
- Explain post-harvest technologies suitable for medicinal plants and herbs

- Explain in general terms how hydroponic systems, soilless media, supplemental lighting, and CO_2 enrichment are used to produce high-value crops
- Discuss how physiological stress factors can be used to optimize secondary metabolite production
- Appraise the importance of the medicinal plant niche in horticulture

Course Overview and Purpose

This course consists of four sections. The first section covers history and future perspectives of medicinal plants and herbs, basic botany, and central dogma. The second section will discuss production of medicinal plants and herbs. The third section will cover post-harvest technology for medicinal plants and herbs. The fourth section will discuss breeding strategy for medicinal plants. The first three sections will be delivered in person, and the fourth section will have hybrid delivery (in-person on Mondays and virtual on Wednesdays *via* Zoom). You can connect to virtual classroom of the fourth section using the following information.

Link: https://ufl.zoom.us/j/96741740077?pwd=wRUXr1ZIV9zCLjT4Y2Xfbr3KDmkBVM.1
Meeting ID: 967 4174 0077
Passcode: 456789

Course Prerequisites

BSC2010 or BSC2011 or BOT2010C or BOT2011C or equivalent

Textbooks, Learning Materials, and Supply Fees

The following books are recommended but not required for the course. Links to peer-reviewed reading materials will be made available via canvas.

- *Ball Redbook Volume 2*, Jim Nau (Ed) 2011, 18th Edition. ISBN 978-1-883052-68-3
- ***Wicked plants: The Weed that Killed Lincoln's Mother and Other Botanical Atrocities***, Amy Stewart, 2009, 1st edition. ISBN 978-1565126831
- *Principles of Plant Genetics and Breeding*, George Acquaah, 2021, 3rd edition. ISBN: 978-1-119-62632-9

Required Technology & How to Obtain the Technology

[Students will need to have access to a laptop computer or tablet to complete the quizzes]

Class Demeanor/Expectations

1. Make-up work

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: *UF Attendance policy*, https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

- Make-up quizzes will be offered only if a valid and documented excuse is approved by the instructor.

2. Team Presentation the teams will present their case studies in the class and all of the team members are expected to participate in the presentation.

3. 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.

General Education or Quest or Writing Objectives and Student Learning Outcomes

[if any are applicable]

General Education Student Learning Outcomes (SLOs)

Student Learning Outcomes (SLOs)	**General Knowledge (content)**	**Skills (critical thinking & communication)**	**SLO Assessment/Assignments**
Students will understand the historical development and future perspectives of medicinal plants and herbs, including their cultural, agricultural, and economic relevance. They will also gain foundational knowledge of breeding strategies, postharvest technologies, and modern production practices that support the quality, efficacy, and sustainability of medicinal plant systems.	• Describe the history and future perspectives of medicinal plants and herbs • Explain breeding strategies for medicinal plants • Describe how hydroponic systems, soilless media, supplemental lighting, and CO_2 enrichment are used to produce high-value crops • Summarize post-harvest technologies suitable for medicinal plants and herbs • Discuss how physiological stress factors can be used to optimize secondary metabolite production •	Communicate scientific knowledge effectively in both written and oral formats Collaborate on preparation of presentation materials Present scientific information clearly in class	Case Study Reports Biweekly in class Quizzes Team presentation

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357

Weekly Course Schedule

Week	Date	Topics	Assessment & Activity	Due Dates
Section 1 Kim (in person)	Jan 12 (Mon)	Class introduction		
	Jan 14 (Wed)	Botany and Central Dogma		
	Jan 19 (Mon)	No Class	Holiday	
	Jan 21 (Wed)	Historical uses of Plants as medicines		
	Jan 26 (Mon)	Medicinal Plants and Human Health	Quiz 1-Kim -in class	
	Jan 28(Wed)	Plant based medicines, Present and Future		
	Feb 2 (Mon)	Omics and metabolic engineering	Quiz 2-Kim – in class	Case Study #1 Due-Feb 4
Section 2 Cho (in person)	Feb 4 (Wed)	Introduction – environmental factors		
	Feb 9 (Mon)	Abiotic factors I – Light and temperature		
	Feb 11 (Wed)	Abiotic factors II - Water		
	Feb 16 (Mon)	Biotic factors I – Diseases and control	Quiz 1-Cho- in class	
	Feb 18 (Wed)	Biotic factors II – Ecology		
	Feb 23 (Mon)	Plant propagation I – Sexual and asexual		
	Feb 25 (Wed)	Plant propagation II - Micropropagation		

	Mar 2 (Mon)	Plant production in controlled environment		
	Mar 4 (Wed)	Production of plant secondary metabolites	Quiz 2-Cho-in class	Case Study #2 Due-Mar 9
Section 3 Liu (in person)	Mar 9 (Mon)	A Guide to harvesting medicinal plants: Developmental stages of medicinal plants.		
	Mar 11 (Wed)	Methods of harvesting medicinal plants	Quiz 1-Liu – in class	
	Mar 16 (Mon)	No Class	Spring Break	
	Mar 18 (Wed)	No Class	Spring Break	
	Mar 23 (Mon)	Important medicinal plant – postharvest technologies and uses (Part 1)		
	Mar 25 (Wed)	Important medicinal plant – postharvest technologies and uses (Part 2)	Quiz 2-Liu-in class	Case Study #3 Due-Mar 27, 5pm, submitted through Canvas
Section 4 Sharma (Mondays in-person and Wednesdays online *via* Zoom)	Mar 30 (Mon)	Domestication		
	Apr 1 (Wed)	Plant genetics		
	Apr 6 (Mon)	Breeding methods	Quiz 1-Sharma in-class	
	Apr 8 (Wed)	Breeder's equation		
	Apr 13 (Mon)	New Breeding Technologies	Quiz 2-Sharma in -class	
	Apr 15 (Wed)	Breeding for therapeutic compounds		
	Apr 20 (Mon)	*Cannabis* breeding (Guest lecture)		Case Study #4 Due-Apr 22

Kim/Ken/Liu/Sharma (in person)	Apr 22 (Wed)	Team Presentation	Presentation-in class	

Grading Policy

Course grading is consistent with UF grading policies.

Course Grading Structure

1. Weekly quizzes 48 points

Each section has two quizzes during class. Quizzes will consist of multiple choice and short answer questions. Each quiz will be worth 6 points, and there will be 8 quizzes during the semester. Each quiz will be taken during class and timed as a paper-based quiz, and it can only be taken once. Each instructor will let the class know the date and the time of quizzes. Make up quizzes will be provided in accordance with the attendance policy described above.

2. Medicinal plant case study 20 points

Students will select one medicinal plant from the provided list and notify Dr. Kim about the selected species. Each species can be selected by up to three students. Once the species is taken by three students, it will be removed from the list. Students will write their own case study to provide practice with technical writing and literature synthesis. Each student will turn in case study reports with the selected species individually at the end of each section. For the first section of the case study, students will write a general description of their medicinal plants, including their scientific name, their history, any known bioactive compounds, and their impact on human health. For the second section, students will write a production of medicinal plants and herbs. Then, students will write a harvest manual and observation reports on the time and method of collection for two different medicinal plants in the third section. For the fourth section, they will compose a breeding strategy to improve the medicinal attributes of this crop. There will be four partial submissions for this case study. Each partial submission will be worth 5 points. Additional guidelines, due dates, and grading rubrics for each submission will be provided via Canvas by the section instructors.

3. Presentation 32 points

The objective of this assignment is to synthesize the information gathered in the medicinal plant case study from each section to present the selected medicinal crop in the class. The students who select the same species will be a team. Each team will prepare a 5-minute presentation where they will summarize all four section case study contents. On April 22 (Wed), the last class, the teams will present their case studies in the class and all of the team members are expected to participate in the presentation. Additional guidelines and grading rubrics for the presentation will be provided via Canvas.

Assignment Type	**Point Value**	**Percent of Final Grade**
Weekly Quizzes	8 quizzes, 6 points per quiz	48
Case Study Reports	4 reports, 5 points per report	30

Assignment Type	Point Value	Percent of Final Grade
Team Presentation	32	32

Grading Scale

Grade	Points	Percentage
A	4.0	95 - 100
A-	3.67	< 95 - 90
B+	3.33	< 90 - 87
B	3.0	< 87 - 83
B-	2.67	< 83 - 80
C+	2.33	< 80 - 77
C	2.0	< 77 - 73
C-	1.67	< 73 - 70
D+	1.33	< 70 - 67
D	1.0	< 67 - 63
D-	0.67	< 63 - 60
S	0	<60

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact UMatterWeCare for additional and immediate support.

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.

Privacy and Accessibility Policies

This course has a comprehensive mini-site in the Canvas platform. Take time to familiarize yourself with the "Start Here", "Syllabus", "Course Materials", and "Grades" tabs in the navigation menu. Digital copies of this syllabus, and other learning materials can be found at *E-Learning in Canvas*, www.elearning.ufl.edu

- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Zoom
  - Zoom Privacy Policy
  - Zoom Accessibility

Additional information

ACADEMIC RESOURCES

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

STUDENT 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 Honor Code and Student Conduct Code.
Policies regarding student in-class recordings are detailed here http://aa.ufl.edu/policies/in-class-recording/.

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

- *Disability Resource Center*, 0001 Reid Hall, (352) 392-8565, https://disability.ufl.edu/