

## ORCHIDOLOGY

ORH4280

3 CREDITS

SPRING 2019

“Orchid Hunting is a mortal occupation.”

- Susan Orlean, *The Orchid Thief*

WEB – ONLINE



### **INSTRUCTOR:**

Dr. Wagner Vendrame

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**OFFICE HOURS:** *By appointment or to be arranged via live chat.*

**COURSE COORDINATOR:** Dr. Wagner Vendrame

**COURSE WEBSITE:** <http://lss.at.ufl.edu>

**COURSE COMMUNICATIONS:** *General questions should be posted to the course's discussion board. Private questions should be sent to the instructor through the course management system.*

**REQUIRED TEXT:** *There is no required textbook for this course, but recommended textbooks are listed:*

Motes, M. 2008. Florida Orchid Growing. Redland Press, Redland, FL.

Arditti, J. 1992. Fundamentals of Orchid Biology. John Wiley & Sons, New York, NY.

Northern, R.T. 1990. Home Orchid Growing. Simon & Schuster, New York, NY.

**ADDITIONAL RESOURCES:** *Additional reading material will be provided.*

**COURSE DESCRIPTION:** The principles and practices involved in the biology and production of orchid plants and flowers, including nomenclature, breeding, seed culture, harvesting, and handling.

**PREREQUISITE KNOWLEDGE AND SKILLS:** Plant Diversity - BOT 2011 or Integrated Principles of Biology - BSC 2011. Course prerequisites can be substituted by similar coursework and/or sufficient knowledge in plant biology and horticulture.

**PURPOSE OF COURSE:** The purpose of Orchidology, ORH4280 is to provide students with general knowledge on the principles and practices of orchid biology and culture. This includes exposing students to the beautiful and exciting diverse world of orchids. We aim to provide students with a broad perspective and greater appreciation for orchids, as well as to elucidate their potential and value as a commercial ornamental crop.

**COURSE GOALS AND/OR OBJECTIVES:** *By the end of this course, students will:*

- Understand the history of orchids and why these plants are so popular and important
- Understand the ecology and evolution of orchids (i.e., habitats, distribution, etc.), as well as conservation approaches
- Appreciate the complexity of orchid classification and tools used for classifying orchids
- Understand orchid nomenclature and terminology used for species and hybrids
- Explain the vegetative morphology of orchids (i.e., flower parts, types of pseudobulbs, etc.)

- Explain the reproductive morphology of orchids (i.e., pollinia, reproductive structures, etc.)
- Explain the mechanisms that regulate flowering in orchids (i.e., photoperiodism, thermoperiodism, etc.)
- Describe the basics of orchid culture, including different media and growing environments
- Understand the basics behind orchid genetics, as specifically related to flower colors
- Understand the basics of plant nutrition and the role of hormones in orchids
- Explain the main pests and diseases that affect orchids
- Appreciate the complexity of pollination mechanisms and the interaction flower-pollinator in orchids
- Describe the different methods for orchid sexual and asexual propagation, including tissue culture
- Appreciate the ethnobotanical utilization of orchids
- Understand the different systems for commercial production of orchids and respective markets

**TEACHING PHILOSOPHY:** I am a strong advocate of developing creative and critical thinking in students. I perceive teaching as stimulating students to think and develop skills to analyze and solve problems, in order to make timely and sound decisions independently. Students should be exposed to different practical challenges to better assimilate and retain the basic concepts. I make a concerted effort to assure active participation and interaction in the classroom, which helps me to give meaning and to concretize abstractions, thus inducing additional creative and critical thoughts.

**INSTRUCTIONAL METHODS:** My basic approach to teaching is appropriately adapted to each subject matter. After introducing the basic concepts to the students, I encourage discussion to critically evaluate those concepts and guide students towards a common conclusion. This type of interaction enhances significantly the learning process, allowing students to grasp a concept and move on to the next level. I use practical and real-life examples as essential elements in my lectures to stimulate critical thinking. My style and methods of teaching are very open. I like to expose concepts, ideas, examples and other material using a combination of discussion, PowerPoint presentations, and videos.

*[It is helpful to students to understand how you have structured the course and how will classes be conducted. If the course has multiple formats (like lecture, lab and discussion, group learning projects and/or presentations) these should be explained clearly.]*

## COURSE POLICIES:

*This is a web-based online course with weekly lectures, assignments, and/or learning activities. Lectures are presented in narrated PowerPoint format. Videos and reading material complement the lectures. All course materials are available via the CANVAS course website.*

*Students are expected to login to the course website at least once a week and complete all activities listed for each particular module, following the course schedule. This includes participation in online discussions, completion of quizzes, and submission of assignment reports by the respective due dates.*

*Requirements for class attendance, absences, and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.*

**\*\*COURSE TECHNOLOGY:** *[If technology is required for the course, indicate how it will be used, how students can access it, and what support and resources are available for students.]*

## UF POLICIES:

**UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES:** Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

**UNIVERSITY POLICY ON ACADEMIC MISCONDUCT:** Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>.

**NETIQUETTE: COMMUNICATION COURTESY:** All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. [Describe what is expected and what will occur as a result of improper behavior]

<http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

## GETTING HELP:

For issues with technical difficulties for E-learning in Canvas, please contact the UF Help Desk at:

- [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu)
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

## GRADING POLICIES:

Tasks	Points (Percentage)
Quizzes (5 points each)	16 x 5 = 80/300 (27%)
Discussion Posts (5 points each)	13 x 5 = 65/300 (21%)
Assignments (10 points each)	8 x 10 = 80/300 (27%)
Learning Activities (10 points each)	5 x 15 = 75/300 (25%)
Total	300 (100%)

**GRADING SCALE:** For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Letter Grade	Grade Points	Numeric Scale
A	4.0	94 – 100%
A-	3.67	90 – 93.99%
B+	3.33	86 – 89.99%
B	3.0	83 – 85.99%
B-	2.67	80 – 82.99%
C+	2.33	76 – 79.99%
C	2.0	73 – 75.99%
C-	1.67	70 – 72.99%
D+	1.33	66 – 69.99%
D	1.0	63 – 65.99%
D-	0.67	60 – 62.99%
E	0.33	< 59.99%

## COURSE SCHEDULE SPRING 2019:

Week	Dates	Topic	Lectures	Activities	Graded Work Due
1	Jan 7-11	Module 1 – Introduction and History	Lectures 1 and 2	<p>Reading: The Beauty of Orchids.</p> <p>Discussion topic 1 – Do you think orchids are still popular? Why? Or why not? How to improve their popularity in the plant market?</p> <p>Assignment 1: Introduce yourself to your instructor and classmates and state your interests and goals for the course. Post a short video on the course website (up to 2 min). Watch your instructor’s intro video as an example.</p> <p>Assignment 2: Answer in 150 words or less: “What is an orchid?”</p> <p>Quiz 1</p>	Jan 12 11:59 pm
2	Jan 14-18	Module 2 – Vegetative Morphology	Lectures 3 and 4	<p>Discussion topic 2 – Can you correlate orchid morphology with their specific habitat? Does that tell you how to grow them?</p> <p>Assignment 3: Identify morphological structures shown in PowerPoint (L4-Assignment). Look at the pictures shown and write down your answers.</p> <p>Quiz 2</p>	Jan 19 11:59 pm

3	Jan 21-25	Module 3 – Reproductive Morphology	Lectures 5 – 7	<p>Discussion topic 3 – Discuss some potential reasons for the large variability in orchid flower shape, color, patterns, etc.</p> <p>Discussion topic 4 – In general, orchids produce large amounts of seeds. Why?</p> <p>Learning Activity 1: Acquire an orchid plant and dissect the flower, report digital images of flower parts with proper identification.</p> <p>Quiz 3</p>	Jan 26 11:59 pm
4	Jan 28-Feb1	Module 4 – Classification and Nomenclature	Lectures 8 – 10	<p>Reading: DNA Data and Orchidaceae Systematics: A New Phylogenetic Classification.</p> <p>Discussion topic 5 – Would you be able to make orchid classification simple? How?</p> <p>Quiz 4</p>	Feb 2 11:59 pm
5	Feb 4-8	Module 5 – Flowering Physiology  Module 6 – Evolution of Orchids	Lectures 11 and 12  Lecture 13	<p>Reading 1: The Gregarious Flowering of the Orchid <i>Dendrobium crumenatum</i>.</p> <p>Discussion topic 6 – How can flowering control be used for orchid commercial production?</p> <p>Reading 2: Orchid Diversity: An Evolutionary Consequence of Deception?</p> <p>Reading 3: Dating the Origin of the Orchidaceae from a Fossil orchid with its Pollinator.</p>	Feb 9 11:59 pm



				<p>Discussion topic 7 – What are some of the evolutionary characteristics in orchids that contributed to their survival to this date?</p> <p>Quiz 5 Quiz 6</p>	
6	Feb 11-15	Module 7 – Orchid Pollination	Lectures 14 and 15	<p>Reading 1: The Role of Preadaptations or Evolutionary Novelty for the Evolution of Sexually Deceptive Orchids.</p> <p>Reading 2: Discovery of Pyrazines as Pollinator Sex Pheromones and Orchid Semiochemicals: Implications for the Evolution of Sexual Deception.</p> <p>Discussion topic 8 – Why have orchids evolved such specific pollination mechanisms?</p> <p>Assignment 4: List the most unique characteristics of orchid flowers that facilitate cross-pollination.</p> <p>Watch videos on pollination (L. 15)</p> <p>Quiz 7</p>	Feb 16 11:59 pm
7	Feb 18-22	Module 8 – Orchid Genetics	Lectures 16 – 19	<p>Reading 1: Why are Orchid Flowers so Diverse? Reduction of Evolutionary Constraints by Paralogues of Class B Floral Homeotic Genes.</p> <p>Reading 2: Molecular Genetics of Reproductive Biology in Orchids.</p> <p>Discussion topic 9 – Can you envision creative ways genetics could be used to improve orchids? Please</p>	Feb 23 11:59 pm

				provide some ideas – use creative and critical thinking skills.  Quiz 8	
8	Feb 25-Mar 1	Module 9 – Media and Growing Environment  Module 10 – Mineral Nutrition	Lectures 20 and 21  Lectures 22 and 23	Reading 1: Fertilizer Source and Medium Composition affect Vegetative Growth and Mineral Nutrition of a Hybrid Moth Orchid.  Reading 2: Impact of a High Phosphorus Fertilizer and Timing of Termination of Fertilization on Flowering of a Hybrid Moth Orchid.  Learning activity 2: Visit local garden store(s) and identify commercial media and fertilizers available that are specific for orchids. Report.  Quiz 9 Quiz 10	Mar 2 11:59 pm
9	Mar 2-9	<b>Spring Break</b>			
10	Mar 11-15	Module 11 – Propagation of Orchids	Lectures 24 – 27	Reading 1: Micropropagation of Orchids: A Review on the Potential of Different Explants.  Reading 2: In Vitro Propagation and Plantlet Regeneration from <i>Doritaenopsis</i> Purple Gem 'Ching Hua' Flower Explants.  Reading 3: Orchid Mycorrhiza: Implications of a Mycophagous Life Style.  Discussion topic 10 – We know the importance of mycorrhizae for orchids. How does that correlate with seed production in orchids? Micropropagation can be	Mar 16 11:59 pm

				<p>used for commercial production of orchids. How can you use micropropagation for the conservation of orchids?</p> <p>Quiz 11</p>	
11	Mar 18-22	Module 12 – Ecology and Conservation	Lectures 28 and 29	<p>Reading: Orchid Cryopreservation</p> <p>Discussion topic 11 – Cryopreservation can contribute to the conservation of orchids. In what aspects? What can be cryopreserved (tissues, organs, etc.)?</p> <p>Assignment 5: Perform a search for organizations dedicated to orchid conservation. Report.</p> <p>Quiz 12</p>	Mar 23 11:59 pm
12	Mar 25-29	Module 13 – Ethnobotany of Orchids	Lecture 30	<p>Reading 1: The Ethnobotany of South African Medicinal Orchids.</p> <p>Reading 2 (Short Abstract): Role of Orchid Societies and Growers in Conservation</p> <p>Assignment 6: Perform a search on additional ethnobotanical uses of orchids. Report.</p> <p>Quiz 13</p>	Mar 30 11:59 pm
13	Apr 1-5	Module 14 – Commercial Production of Orchids	Lectures 31 and 32	<p>Reading: Development of <i>Phalaenopsis</i> Orchids for the Mass-Market.</p> <p>Video segments - orchid nurseries: Video 1: Altria Lab Plants Video 2: Silver Vase Video 3: Motes orchids</p>	Apr 6 11:59 pm

				<p>Assignment 7: You are starting an orchid nursery. Describe your system production, including potential species to be commercialized. Describe your strategies to make your orchid business profitable. Be creative.</p> <p>Learning activity 3: Visit an orchid nursery and report the type of production system and production details.</p> <p>Quiz 14</p>	
14	Apr 8-12	Module 15 – Orchid Culture	No Lectures, videos only	<p>Discussion topic 12 – When I usually give talks to orchid societies, not many young people are present. How would you attract and/or encourage your friends to participate in orchid societies? What about younger people in general?</p> <p>Video segments:  Video 1: Aspects of Orchid Judging  Video 2: Orchid Societies  Video 3: Orchid Shows</p> <p>Learning activity 4: Attend an orchid society meeting and/or an orchid show/exhibit that is closest to your location. Report.</p> <p>Quiz 15</p>	Apr 13 11:59 pm
15	Apr 15-19	Module 16 – Orchid Pests and Diseases	Lectures 33 and 34	<p>Discussion topic 13: Could we minimize the use of pesticides for orchid pest control? What are some of your ideas?</p> <p>Assignment 8: Search the scientific literature and report a recent article reporting a new orchid disease</p>	Apr 20 11:59 pm

				Learning activity 5: Visit a local orchid nursery and identify any existing pests and diseases. Report.  Quiz 16	
16	Apr 24	<b>Last Day of Classes</b>			

Disclaimer: *The syllabus and course schedule are subject to change as the needed.* This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes are not unusual and should be expected and will be communicated clearly.