

BOT 6726/ZOO 6927
Principles of Systematic Biology
Spring 2023

Instructors:

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- Pam Soltis (301 Dickinson; phone: 273-1964; e-mail: psoltis@flmnh.ufl.edu)
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Office Hours: By appointment.

Credits: 4

Schedule:	Lecture	MW	3rd period (9:35-10:25am) in Bartram 221
	Lecture/discussion/lab	F	3rd-5th period (9:35–12:35) in Bartram 221

Lab manual: Will be provided as a PDF on Canvas.

Textbooks:

Recommended: Baum and Smith. 2013. *Tree Thinking: An Introduction to Phylogenetic Biology*. Greenwood Village (Colorado): Roberts and Company Publishers. [especially Chapters 6, 8, and 10]

Optional: Stuessy, Crawford, Soltis, and Soltis. 2014. *Plant Systematics. The Origin, Interpretation, and Ordering of Plant Biodiversity*.

Other books, not required, but useful:

- *Phylogenetic Analysis of Morphological Data* by J. J. Wiens (ed.). Smithsonian Institution Press, Washington, D.C. [2000] [Chapter 5]
- *Plant Systematics: A Phylogenetic Approach*, 3rd edition by Judd et al. Sinauer Assoc., MA. [2008] [Chapters 1 & 2]

Additional readings from the primary literature will be assigned during the semester, and extracts from numerous other articles will be provided as they relate to lecture topics: These will be made available as PDFs on Canvas.

Grading:

- Two exams: 30% each
- Tau Ceti: 20% (one presentation and interim updates)
- Participation: 20%

Grade based on total number of points, with 90% or above an "A", 89-80% "B", 79-70% "C", 69-60% "D", and below failing; plus grades will be used.

Attendance and make-ups:

Requirements for class attendance 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>.

If you are experiencing COVID-19 symptoms ([click here for guidance from the CDC on symptoms of coronavirus](#)), please use the UF Health screening system and follow the instructions on whether you are able to attend class. [Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms](#). Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. Refer to the above link for more information on the university's attendance policy.

Accommodations:

Students who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluations:

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 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 ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/.

Academic Integrity:

"UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honorcode/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Resources Available to Students:***Health and Wellness***

- *U Matter, We Care*: umatter@ufl.edu; 392-1575
- *Counseling and Wellness Center*: <http://www.counseling.ufl.edu/cwc/Default.aspx>; 392-1575
- *Sexual Assault Recovery Services (SARS)*: Student Health Care Center; 392-1161
- *University Police Department*: <http://www.police.ufl.edu/>; 392-1111 (911 for emergencies)

Academic Resources

- *E-learning technical support*: Learningsupport@ufl.edu; <https://lss.at.ufl.edu/help.shtml>; 352-392-4357 (opt. 2)
- *Career Resource Center*: Reitz Union; <http://www.crc.ufl.edu/>; 392-1601
- *Library Support*: <http://cms.uflib.ufl.edu/ask>

- Teaching Center: Broward Hall; 392-2010 or 392-6420
- Writing Studio: 302 Tigert Hall; <http://writing.ufl.edu/writing-studio/>; 846-1138

Procedure for Conflict Resolution:

Any classroom issues, disagreements or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, please contact the Graduate Coordinator or the Department Chair. Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (<http://www.ombuds.ufl.edu>; 392-1308) or the Dean of Students Office (<http://www.dso.ufl.edu>; 392-1261). For further information refer to https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf (for residential classes) or <http://www.distance.ufl.edu/student-complaintprocess> (for online classes).

Schedule (subject to change):

Jan 9	NC	Course Overview. Introduction to “tree-thinking”, contributions of Darwin and Hennig (with definitions of basic terms)	
Jan 11	NC	Classification construction	
Jan 13	NC	Biological nomenclature	
Jan 16		NO CLASS (MLK Day)	
Jan 18	NC	Phylogenetic Taxonomy	
Jan 20	NC	Phylogenetic Taxonomy	
Jan 23	NC	Intro to species and speciation	
Jan 25	NC	Species concepts	

Jan 27	NC	species concepts + Discussion	
Jan 30	DS	Tree construction, conceptual introduction to parsimony	
Feb 1	DS	Computerized tree construction, incl. parsimony as an optimization criterion (in molecular and morphological analyses), tree-searching methods, heuristic and branch-and-bound, branch-swapping, addition sequences, etc.	
Feb 3	DS/ PS	Introduction to characters, homology decisions, states and their delimitation; ordering character states in transformation series; Polarity decisions, the outgroup method; Rooting networks; brief survey of other methods of polarizing characters Discussion of characters, alignment, states, etc. Optimizing character state distributions on trees, ACCTRAN, DELTRAN, trees; continuation of previous lecture. LAB: Manual cladistics workshop	
Feb 6	PS	Estimating reliability of phylogenetic trees—modern approaches	
Feb 8	DS	Simultaneous and partitioned analyses	
Feb 10	PS	Supermatrix vs. Supertree approaches Neighbor-joining and UPGMA LAB: manual supertrees	
Feb 13	AK	Maximum likelihood methods	

Feb 15	AK	Bayesian methods	
Feb 17	AK	Lab: Discussion - Comparison of Methods	
Feb 20	AK	Integrating molecular and morphological analyses	
Feb 22	AK	Gene tree vs. species tree reconciliation	
Feb 24	NC	Tours	
Feb 27	LM	Intraspecific variation	
Mar 1	LM	Cytological methods in systematics	
Mar 3	NC	Tours	
Mar 6	DS	Hybridization, polyploidy, and reticulation	
Mar 8	DS	Phylogeny and developmental evidence (evo-devo)	
Mar 10		Exam 1 through Mar 8	

Mar 13		SPRING BREAK	
Mar 15		SPRING BREAK	
Mar 17		SPRING BREAK	
Mar 20	DS	Fossils and systematics	
Mar 22	PS	Divergence time estimation	
Mar 24	NC	Tours	
Mar 27	LM	Biogeography	
Mar 29	LM	Phylogeography	
Mar 31	NC	LAB: Tau Ceti workday	
Apr 3	PS	Population genetics, conservation	
Apr 5	PS	DNA Barcoding	
Apr 7	PS	LAB: Tau Ceti work day	

Apr 10	DS	Spatial Phylogenetics	
Apr 12	PS	Digitization and Global Resources	
Apr 14		Exam 2: Putting it all together	
Apr 17	All	Tau Ceti Workday or topic requested by students	
Apr 19	All	Tau Ceti Workday or topic requested by students or Tau Ceti presentations	
Apr 21	All	Tau Ceti presentations	
Apr 24	All	Tau Ceti presentations	
Apr 26	All	Tau Ceti presentations	