

ECOSYSTEMS OF FLORIDA (BOT 5695: 4credits)

SPRING 2015 SYLLABUS

Wednesdays 1:55-2:45 (period 7)---110 Rolfs Hall

Fridays 12:50-4:55 (periods 6-9, may end earlier if we are not field-bound)

Some Saturdays 8:00-5:00 (or earlier, depending on destinations)

One overnight to a lovely place with white sand beaches etc.

Field trips depart promptly from behind Bartram Hall.

Professor Francis E. “Jack” Putz

Research Areas: conservation biology, tropical forest ecology and management, fire ecology, restoration, ethnobotany, sea level rise impacts in Florida, the art-science nexus

Office Hours: Wednesdays and Fridays 1000-1200 h

Office: Carr 209; telephone 392-1486; e-mail: fep@ufl.edu

Laboratory Co-Instructor: Ruslandi

Research Areas: tropical forestry, data handling and analysis

Office: 511 Bartram Hall; telephone 392 1468; e-mail: ruslandi_rsl@yahoo.com

Objectives: To acquaint course participants with major Florida ecosystems and some pressing local environmental issues while helping them develop their research skills. Natural history and field research methods will be stressed along with ways to communicate research results. Lectures and readings on Florida ecosystems and ecological methods will be supplemented by participant-designed field problems, preparation and submission of manuscripts, and oral presentations of the results of field studies.

Readings: Most readings for the course are on electronic reserve. Additional materials will be on reserve at Marston Science Library, e-mailed as PDFs, or otherwise made available. The instructor newly published book of nature essays entitled Finding Home in the Sandy Lands of the South: A Naturalist’s Journey in Florida is strongly encouraged—if readership is down, he promises to inflict verbal versions of these stories on the class *ad nauseam* (available from Kindle and Amazon). To help class participants develop a “sense of place” (and to give them an excuse to read some Florida fiction), everyone must also read at least one of the following historical novels: The Yearling, Don Juan McQueen, A Land Remembered, River Without End, or two “Cracker westerns” by Lee Gramling, Jon Wilson, or Rick Tonyan (the instructor abjures any responsibility if participants end up readings >2 Cracker westerns). Libraries stock these novels, used copies are readily available at local shops and web outlets, and I have a stack of “lenders”---alternate readings will be entertained.

Assignments: All papers will be submitted using the style described in the “Instructions to Authors” for Ecology, as detailed on the Ecological Society of American (ESA) website. Grades on late assignments will be reduced by 5% per day without prior arrangement. A detailed grading rubric will be provided.

Attendance Policy: You are expected to attend all field trips and classes, but with prior notification, optional activities can be designed.

Field Trips: Field trips will be held either on Friday afternoons or Saturdays and will depart from behind Bartram Hall. We will leave promptly at 1250 h (Fridays) or 0800 h (Saturdays), unless otherwise specified. Course participants are responsible for assembling in advance all of the required materials for their field work including appropriately accessorized attire and personal safety gear.

Grading: For an explanation of UF grade scales see:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> and

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Recommended Texts: Ecosystems of Florida (EF); The Elements of Style (Strunk and White); a statistics reference book (almost any will do) or good websites with which you are familiar; and, a plant guide (e.g., Godfrey, R.K. Trees, Shrubs, and Woody Vines of Northern Florida and Adjacent Georgia and

Alabama). Many required readings will be provided to you as PDFs or made available on our e-learning site, but you will also be expected to search the primary literature yourselves.

Pedagogical Philosophy: If you know a bit about my ideas about learning, it may help you to understand and accept how this class will unfold. I claim no particularly inspired insights about education, but I try to act in accordance with the following precepts and otherwise promote participatory, learner-centered activities:

1. The extent to which adults learn new material varies with whether it is simply heard (20%), heard and seen (40%), or experienced (80%).
2. Experiential learning situations in which learners learn from each other and the trainer learns from the learners should be maximized while use of traditional transmission-based approaches should be minimized.
3. Participatory learning is active, not passive.
4. Adult learners prefer to be self-directed or at least to share responsibility for their own learning.
5. Motivation to learn increases when the topic under consideration fills an immediate need.
6. Maximum learning from an experience occurs when there is time to reflect back on it, draw conclusions, and derive principles for application to similar situations in the future.
7. Provide lots of corrective but supportive feedback.
8. Show respect for the learner and otherwise foster trust so as to assist the learning process.
9. Provide a safe, cheery, and comfortable atmosphere for learning.

Notes:

- This syllabus is a working document that is subject to change, open to negotiation, and otherwise mutable as appropriate for a 5000-level course, especially one with the stated pedagogical philosophy. In other words, adoption of an “adaptive management” approach will require some departures from the pre-supplied syllabus.
- Class participants have a wide variety of backgrounds, interests, and professional aspirations. Efforts will be made to tailor the course to the needs and desires of each participant, but such modifications require a free flow of information and suggestions.
- Superimposed on this tentative syllabus is a day of fire. Given the vagaries of scheduling controlled burns, we will have to go whenever the burn bosses give the go-ahead—justification to your other instructors will be provided if necessary and they will be invited to participate.

January

7 W: Overview of the course, reflections on field ecology as a Science, and an assessment.

Assignment: Learn some basic Floridian geography (the Atlas of Florida is a good start or use Google Maps, Google Earth, or etc.)—you will be expected to be able to draw a quick sketch of Florida showing the prominent physiographic features (e.g., major rivers, mountains, and lakes).

9 F Field: Ecosystems of Alachua County: learn the dominant arboreal species and start to read landscapes.

Read:

(1) Ecosystems of Florida (edited by Myers and Ewel) pages 3-10 (by Ewel).

(2) Platt, W.J. 1999. Southeastern pine savannas. In, Anderson et al. (editors), 1999. Savannas, Barrens, and Rock Outcrop Community of North America.

Assignment: Start making your own reference collection with diagnostic snippets of plants.

Learning Objectives: Recognize the dominant arboreal species, know some of their basic natural history, and start to “read local landscapes.”

14 W: Statistics workshop. Be prepared to do a lot of graphing---with pencils, rulers not needed.

Learning Objective: Increased capacity to handle data, think about variance, and understand what statistical tests do and how. This is NOT a statistics course, I am NOT a statistician, and you will NOT be expected to master lots of statistics, but everyone should leave the course with a high comfort level with basic tests such as Student’s t, ANOVA, regression, and contingency analysis. Statistics is NOT a formal course prerequisite, but you will nonetheless be expected to graph and analyze your data appropriately.

Assignment: Draw a basic timeline that starts at the Big Bang and proceeds to the present in reducing order-of-magnitude jumps. Use whatever historical resources you can find (e.g., The New History of Florida) to populate your line with >10 Florida-relevant events. You will continue to use this template during lab on Friday at the Florida Museum of Natural History.

16 F Field: Florida Museum of Natural History with emphasis on the paleoecology of Florida.

Read: Watts, W.A. 1980. The late Quaternary vegetation history of the southeastern United States. Annual Review of Ecology and Systematics 11: 387-409.

Randazzo and Jones (editors). The Geology of Florida Pages 1-12 (by W. Schmidt), pages 57-67 (by Scott), and pages 217-249 (by Upchurch and Randazzo).

Learning Objective: Develop your sense of time as it relates to Florida.

Assignment: Use the time line you created for Florida based on your readings and the displays in the Hall of Fossils to lead your team to victory.

21 W: Climate of Florida workshop. Bring to class a printout of a Florida weather map from some interesting date.

Read: Chen and Gerber, "Climate," in Ecosystems of Florida.

Learning Objective: Be able to use first principles to explain the main climatological patterns affecting Florida.

Assignment: Before class, be sure you have reviewed and understood the basic principles of climatology provided (clarification provided upon request).

Select and start to read your Florida-based novel. Make note of important passages in which the author represents, misrepresents, or otherwise employs the ecosystems of Florida.

23 F: Ecology of fire.

Learning Objectives: Understand the essential physical features of fire and how they relate to the role of fire in shaping ecosystems.

Read: Handouts and pages 1-56 in R.J. Whelan (1995) The Ecology of Fire.

24 S Field(weather permitting): Experience with fire—what exactly we will do depends on the weather, fire permits, and etc. Much time spent brainstorming. Back noonish.

Learning Objective: Accumulate enough first-hand experience with fire for the conceptualization of an informed fire research project.

Assignment: Hand in a single declarative statement in the form of a falsifiable hypothesis accompanied by a graph depicting the expected results if your hypothesis is supported.

28 W: Oral presentations of fire project proposals, 2 minutes each (timed). Powerpoint slides permitted.

Read: Brown et al., "Soils" in EF pages 35-69.

Learning Objective: Recognize and implement the recommendations presented below in the "Grading Rubric for Oral Presentations."

Read: Brown et al., "Soils" in EF pages 35-69.

30F Field: McCarty Woods---long pants and closed-toed shoes recommended. Topic: Soil infiltration, data handling, minimum sample sizes. Small group "thought projects" on soil compaction.

Learning Objectives: Develop experience with handling data (i.e., graphing), dealing with variance, generating falsifiable hypotheses based on field observations, designing manipulative experiments to test those hypotheses, and thinking through the statistical analysis of the resulting data. Also understand ultisols.

Assignment: Hand in a 2-3 page research proposal for your fire ecology project. Use the format of an NSF Dissertation Improvement Grant along with the Instructions for Authors for the journal Ecology. Some of the sections will be VERY short, but they should all be included. Be sure to have >3 references from the primary literature (i.e., websites and textbooks do not constitute acceptable citations). Also include a

graph of the expected results if your hypothesis is supported. Note that you are likely to employ some of the prose in this proposal in the write up of your fire experiment.

February

4 W. Global climate change as related to Florida. Coastal ecosystems and sea level rise.

Read:

- (1) Williams et al. 1999. Ecology 80: 2045-2063.
- (2) Putz, F. E. 2012. Coastal forest retreats as sea level rises. The Palmetto 29: 8-11.
- (3) Misra et al. 2011. Climate scenarios: A Florida-centric view. Florida Climate Institute White Paper (scan in its entirety and read the sections of interest).

Assignment: Go to <http://gulfmex.coastalresilience.org/> and play around for 30 minutes or so.

6 F. Sand pine scrub ecology, management, and edge effects.

Read:

- (1) Menges, E. 1999. Ecology and conservation of Florida scrub. In, Anderson et al. (editors), 1999. Savannas, Barrens, and Rock Outcrop Communities of North America.
- (2) Browse through the provided selection of papers on edge effects and then read a few (>2) to get ideas for an edge effect research project that you will conduct in sand pine scrub in Ocala National Forest. We will hold a workshop on edge proposals, so be sure to read in advance and come to class with ideas for research projects.

Learning Objective: Improved capacity to generate falsifiable hypotheses based on knowledge of the literature and ecological insights.

7-8 S-S Field: Yankee Town marshes to see sea level rise first hand, then to Seahorse Key for Ecolympics and the night. We will sleep and cook in the lighthouse. You need to bring a sleeping bag, a towel, and toiletries. Note that the “moose-turd pie principle” applies to cooking arrangements. Be ready to get wet to your knees or boot yourself and hope.

Learning Objectives:

- (1) Master the natural history and field identification of the dominant salt marsh and mangrove species.
- (2) Develop ideas about the dynamics of the salt marsh-mangrove forest interface.
- (3) Understand the natural history underlying sea level rise driven ecosystem shifts.
- (4) Improve your field ecology skills (e.g., plot demarcation, tree height measurement, etc.)

11 W: Hammocks and hardwoods. Plant display and workshop.

Read: Platt, W.J. and M.W. Schwartz. Temperate hardwood forests. Pages 194-229 in EF.

Learning Objective: Identification of the major hammock hardwoods based on vegetative characteristics. Recognize distinctiveness of the gap-phase mode of regeneration of many hammock tree species.

13 F: No class but participation expected in either the TCD Research Workshop or the PIEE Conference.

18 W: Exotic invasives

20 F: Exotic invasive species workshop

25 W: TBA

27 F Field: McCarty Woods, collect the necessary data to run Markov model representing transitions in the species composition of canopy trees.

Read:

- (1) Distributed notes on forest succession and matrix algebra.
- (2) Horn, H.S. 1975. Forest succession. Scientific American 232: 90-98.

Learning Objectives:

- (1) Understand the workings of about the simplest possible simulation model for predicting changes in forest composition over time.
- (2) Recognize the powers and weaknesses in this approach.

March

4 & 6 W & F: No class, Spring Break.

11 W: Ecology of flooding.

Read: Relevant chapters from plant physiology books or appropriate websites on anaerobiosis.

Learning Objectives: Understand why plants drown, why histosols are usually wet, and why droughts kill so many wetland trees.

13 F Field: Swamp ecology at Cypress Highlands and thereabouts. Be prepared to get wet. A virgin cypress strand and a bayhead are featured.

Read: Ewel, K.C., 1990. Swamps. Pages 281-323 in EF.

14 S Field: Ocala National Forest (or fire if we get the permit; one way or another, a field research day).

Assignment: Depending on our destination, conduct either your edge-effect or fire ecology research.

18 W: Oral presentations of field research results (either fires or edges).

Learning Objectives: This presentation will be graded on the basis of the rubric provided below, the recommendations of which should be reflected in the structure of the talks, any slides presented, and the mode of presentation.

20 F: Pine workshop,

Assignment: Bring samples of 3 species with cones of both genders if possible.

Read: Keeley and Zedler 1998. Evolution of life histories in Pinus. Pages 3-40 in, Richardson, D.M. (editor). The Ecology and Biogeography of Pinus.

21 S Field: Ocala National Forest (or fire if we get the permit; one way or another, a field research day).

Assignment: Depending on our destination, conduct either your edge-effect or fire ecology research.

25 W: Restoration ecology and practice, Florida style.

Read: Browse recent issues of Restoration Ecology and read two articles, at least one of which should be of a philosophical nature and neither should be about Florida or longleaf pine.

Assignment: Submit via e-mail as a Word File by 1700 h on the day before class a 100-word essay about each article in which you explore the relevance of the articles to Florida. Be sure to include the complete citation and send the PDF. Enrich the class discussion with insights derived from your reading.

27 F Field: Restoration project study tour.

April

1 W: Forest ecosystem management or fiber farming, Florida style.

Read: Jokela et al. 2004. Production dynamics of intensively managed loblolly pine stands... Forest Ecology and Management 192: 117-130. While you're at it, skim through the other articles in this special issue.

3 F Field: Industrial Forestry Fiber Farming (IFFF) Study Tour, Austin Cary Memorial Forest.

Activity: During the field trip you will also each present an analysis of the use of "Florida" in your fiction novel.

8 W: TBA.

10 F Field: Ordway Preserve.

15 W: Models of Florida ecosystems: succession and ordinations.

Read: Duever, M.J. and R. E. Roberts. 2013. Successional and transitional models of natural South Florida, USA, plant communities. *Fire Ecology* 9: 110-123.

Learning Objectives:

17 F Classroom then Field: Finish any remaining oral presentations and then head off to the field to study suburban ecology and to take the final plant quiz.

22 W: FINAL EXAM (last day of classes): Cumulative, heavily based on the assigned readings, open book, starts in class, submit on paper in (or under the door of) 209 Carr Hall by 1200h Thursday, 25 April.

Make-up Policy for Missed Exams and Assignments

Students with valid excuses will be provided make-up exams and time to submit other missed assignments.

Class Attendance

If you are unable to attend a class (particularly a lab), prior notification will be appreciated, but in the case of emergencies that do not allow prior notification, accommodation will be made.

UF Counseling Services

- Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
 - UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
 - Career Resource Center, Reitz Union, 392-1601, career and job search services.
- Many students experience test anxiety and other stress related problems. "A Self Help Guide for Students" is available through the Counseling Center (301 Peabody Hall, 392-1575) and at their web site: <http://www.counsel.ufl.edu/>.

Academic Integrity: 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/honorcodes/honorcode.php>

Accommodation for Students with Disabilities

- Students who will require a classroom accommodation for a disability must contact the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). Please see the University of Florida Disability Resources website for more information at: <http://www.dso.ufl.edu/drp/services/>.
- It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate the student.

Software Use: All faculty, staff and student 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.

GRADING RUBRIC FOR MANUSCRIPTS

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1. Does the manuscript style conform to the specified journal? | ___ of 7 |
| 2. Is the title clear, informative, and otherwise appropriate (i.e., does it give readers a good idea of the topic of the paper)? | ___ of 4 |
| 3. Is the abstract sufficiently concise but report the main results in a meaningful manner? | ___ of 4 |
| 4. Are grammatical and orthographic errors avoided (including run-on sentences and punctuation)? | ___ of 6 |
| 5. Does the prose “make sense” and is it flow freely (e.g., <i>non sequitors</i> are avoided)? | ___ of 7 |
| 6. Are superfluous prose and otherwise unnecessary detail avoided? | ___ of 6 |
| 7. Is the introduction organized in a reasonable and easy-to-follow manner and are each of the major points made in the results and discussion sections sufficiently “motivated”? | ___ of 6 |
| 8. Does each section contain the required information in the expected sequence? | ___ of 5 |
| 9. Is each paragraph supported by a solid topic sentence? | ___ of 7 |
| 10. Are the figures and tables clear and justified? Together with their legends, do they “stand alone” (i.e., readers can understand them without reference to the text)? | ___ of 7 |
| 11. Are citations used appropriately? | ___ of 5 |
| 12. Do all ideas flow logically (i.e. are the arguments presented reasonable and sound)? | ___ of 7 |
| 13. Are reasonable counter-arguments (i.e., alternative interpretations) considered? | ___ of 4 |
| 14. Are novel or interesting, connections to the literature made? | ___ of 4 |
| 15. Are the methods used logical, appropriate, and clearly explained? | ___ of 3 |
| 16. Are the manuscript and all of its sections appropriate in length? | ___ of 5 |
| 17. Is the selection of “keywords” appropriate? | ___ of 5 |
| 18. Was the statistical approach appropriate and presented clearly? | ___ of 6 |
| 19. Was the word “significant” as well as gender-biased and overly colloquial language avoided? | ___ of 2 |
| TOTAL: | _____ of 100 |

GRADING RUBRIC FOR ORAL PRESENTATIONS

The following is provided as a guide to what your instructor feels is important in oral presentations. Use it when you practice your talk. Please pay attention to the footnoted information.

POINTS	1	2	3	4	TOTAL
Organization	Sequence of information is elusive, ending uncomfortable for all.	Presentation jumps in and out of a logical sequence, ending not planned.	Logical sequence that is easy to follow and ends appropriately.	Logic easy to follow ends nicely, and connections between parts are interesting and well integrated.	
Content of Slides	Unclear, lacking important information or either too wordy (impossible to read in the time given).	A bit unclear and lacking important information or either too wordy.	Clear, but some information could have been omitted; mistakes in species name.	Clear, just relevant information is provided (I could read everything!), species properly named ¹ .	
Graphics	Graphics none.	Graphics occasionally used, reasonably well made, but not very supportive or with mistakes.	Graphics relate to and support the presentation but with minor mistakes.	Graphics well executed ² and serve to help explain and reinforce the presentation.	
Timing	Rushed and not completed on time, or inappropriately short	Pace uneven, with parts rushed and others too slow	Pace basically good but transitions awkward	Good pace, Seamless transitions, fits allotted time	
Eye Contact	Little or none	Occasional	Frequent	Appropriate	
				TOTAL POINTS of 16 possible	

¹ Scientific name (italicized or underlined) followed by the common name in parenthesis the first time the species is mentioned. Note that the first letter of the genus should be capitalized, but no others.

² Check for clear and precise labels on both axes, scales that match if there is more than one graph, treatments should be well distinguished and identified. Overall, the message should be easy to interpret.