SCHOOL OF FOREST RESOURCES & CONSERVATION
UNIVERSITY OF FLORIDA
SPRING 2020

Instructors:

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Location: 0112 Newins-Ziegler Hall
Class Hours: Thursday, periods 7-8 (1:55pm-3:50pm)

COURSE DESCRIPTION & LEARNING OBJECTIVES

This course focuses on an examination of paradigms related to wildland fire, whether biological, political, or social. Students will engage in in-depth reviews and syntheses of existing evidence for/against multiple paradigms. The theoretical basis, and ecological, policy, or management implications will also be investigated. All graduate students with an interest in fire ecology, and background in related coursework, are welcome.

Course Learning Objectives

At the end of this course, each student will be able to:

- Critically evaluate the ecological implications of fire management practices
- Apply an in-depth understanding of fire ecology to fire research endeavors
- Engage in critical examination of a variety of fire ecology approaches, subjects, and methodological applications
- Demonstrate increased individual ability to utilize and/or improve upon existing fire ecology theory and/or models

General Course Overview

Each year new "fire paradigms" will be investigated. A variety of approaches will be employed in an attempt to support or refute the accepted theory and its associated implications. Students, working in pairs or groups depending on enrollment, will utilize multiple avenues of investigation, conduct an analysis of existing primary literature, devise an actual or hypothetical experiment or analysis by which to test the theory, and work collaboratively to produce a final multi-authored manuscript suitable for publication. *Students will work with instructors to identify each year's fire paradigms.*

Potential approaches include:

- Paleoecology/ fire history
- Fire behavior and ecology modeling
- Meteorology and climate/weather analyses
- Biogeography and fire regimes
- Autecology
- Human dimensions
- Implications for management, science, and policy

Format

Alternate spring semesters, contingent on demand, with weekly or biweekly meetings; 2-3 hour length. Format is a mixture of discussions, student/ instructor presentations, lectures by invited guests, and guided research and writing.

EVALUATION OF STUDENT PERFORMANCE

Distribution of Grades

60% Final manuscript and associated milestones
15% Peer review
15% Presentation
10% Leading discussion and active participation based on thorough preparation

Grading Scale

Percentage	*Grade*	*Percentage*	*Grade*
100-93	A	76.9-73	C
92.9-90	A-	72.9-70	C-
89.9-86	B+	69.9-67	D+
85.9-83	B	66.9-63	D
82.9-80	B-	62.9-60	D-
79.9-77	C+	59.9-0	E

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

Class Expectations, Make-up, and Attendance Policies

Weekly attendance and active participation in discussions are predicated on having read and interpreted the assigned literature, or prepared the assignment, prior to meetings.

Policy on Late Work

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

OVERVIEW OF ASSIGNMENTS & DUE DATES

1. **Final manuscript and associated milestones**
   - **a. Brief description of topic (5 points; group/individual assignment):** Use one paragraph to briefly and concisely describe your chosen topic. **Due Jan. 30 by 5pm.**
   - **b. Annotated bibliography (10 points; individual assignment):** List ten references relevant to your chosen topic and briefly summarize each paper in 1-3 sentences or bullet points. **Due Feb. 27 by 5pm.**
   - **c. Draft (15 points; group/individual assignment):** Complete draft of manuscript to be reviewed by your instructors and peers. **Due March 19 by 5pm.**
   - **d. Final report (70 points; group/individual assignment):** Consider the reviews from your instructors and peers and revise your manuscript. **Due April 16 by 5pm.**

2. **Peer review (100 points; individual assignment):** Each student will review a draft of another group's manuscript and provide a thorough and constructive peer review. We will discuss how to complete a peer review in class. For additional information, also see How to Perform a Peer Review. **Due March 26 by 5pm.**

3. **Presentation (100 points; group assignment):** Your group will prepare a concise, 15-minute presentation to introduce and explain your fire paradigm. Following the presentation, there will be 5-10 minutes for questions. **Due April 9 in class.**

4. **Leading discussion and active participation based on thorough preparation (100 points; individual assignment):** We estimate that each person will be responsible for leading the discussion of 1-2 peer-reviewed papers over the semester. **Due date(s) will vary by person.**

REFERENCES

Assigned Readings

Beckage, B., Platt, W.J. and Gross, L.J. 2009. Vegetation, fire, and feedbacks: a disturbance-mediated model of savannas. The American Naturalist 174:805-818.

Cannon, J.B., Peterson, C.J., O'Brien, J.J. and Brewer, J.S. 2017. A review and classification of interactions between forest disturbance from wind and fire. Forest Ecology and Management 406:381-390.

Fill, J.M., Platt, W.J., Welch, S.M., Waldron, J.L. and Mousseau, A. 2015. Updating models for restoration and management of fiery ecosystems. Forest Ecology and Management 356:54-63.

Freeman, J., Leda, K., Rose, E. and Cropper, W. 2017. A critique of the historical-fire-regime concept in conservation. Conservation Biology DOI: 10.1111/cobi.12942.

Hoffmann, W.A., Sanders, R.W., Just, M.G., Wall, W.A. and Hohmann, M.G. 2019. Better lucky than good: How savanna trees escape the fire trap in a variable world. Ecology https://doi.org/10.1002/ecy.2895.

McGlinn, D.J. and Palmer, M.W. 2019. Examining the assumptions of heterogeneity-based management for promoting plant diversity in a disturbance-prone ecosystem. PeerJ *7*:e6738.

Naeem, S. 2002. Ecosystem consequences of biodiversity loss: the evolution of a paradigm. Ecology 83:1537-1552.

Parr, C.L. and Anderson, A.N. 2006. Patch mosaic burning for biodiversity conservation: A critique of the pyrodiversity paradigm. Conservation Biology 20:1610-1619.

Veenendaal, E.M., Torello-Raventos, M., Miranda, M.S., Sato, N.M., Oliveras, I., van Langevelde, F., Asner, G.P. and Lloyd, J. 2018. On the relationship between fire regime and vegetation structure in the tropics. New Phytologist 218:153-166.

Additional Fire Paradigm Papers (but there are certainly many more)

Ale, S.B. and Howe, H.F. 2010. What do ecological paradigms offer to conservation? International Journal of Ecology DOI: 10.1155/2010/250754.

Bowman, D.M., Balch, J., Artaxo, P., Bond, W.J., Cochrane, M.A., D'antonio, C.M., DeFries, R., Johnston, F.H., Keeley, J.E., Krawchuk, M.A. and Kull, C.A. 2011. The human dimension of fire regimes on Earth. Journal of Biogeography 38:2223-2236.

Griffiths, A.D., Garnett, S.T. and Brook, B.W. 2015. Fire frequency matters more than fire size: Testing the pyrodiversity–biodiversity paradigm for at-risk small mammals in an Australian tropical savanna. Biological Conservation 186:337-346.

Hart, J., O'Keefe, K., Augustine, S.P. and McCulloh, K.A. 2020. Physiological responses of germinant *Pinus palustris* and *P. taeda* seedlings to water stress and the significance of the grass-stage. Forest Ecology and Management 458:117647.

Keeley, J.E., Pausas, J.G., Rundel, P.W., Bond, W.J. and Bradstock, R.A. 2011. Fire as an evolutionary pressure shaping plant traits. Trends in Plant Science 16:406-411.

Kelly, L., Brotons, L., Giljohann, K., McCarthy, M., Pausas, J. and Smith, A. 2018. Bridging the divide: Integrating animal and plant paradigms to secure the future of biodiversity in fire-prone ecosystems. Fire 1:29.

Perry, J.J., Vanderduys, E.P. and Kutt, A.S. 2016. Shifting fire regimes from late to early dry-season fires to abate greenhouse emissions does not completely equate with terrestrial vertebrate biodiversity co-benefits on Cape York Peninsula, Australia. International Journal of Wildland Fire 25:742-752.

Pile, L.S., Wang, G.G., Knapp, B.O., Liu, G. and Yu, D. 2017. Comparing morphology and physiology of southeastern U.S. *Pinus* seedlings: implications for adaptation to surface fire regimes. Annals of Forest Science 74:68.

Pingree, M.R. and Kobziar, L.N. 2019. The myth of the biological threshold: A review of biological responses to soil heating associated with wildland fire. Forest Ecology and Management 432:1022-1029.

Background Readings

Agee, J.K. 1993. *Fire ecology of Pacific Northwest forests*. Island Press, Washington DC. 513p.

Biswell, H.H. 1989. *Prescribed burning in California wildlands vegetation management*. University of California Press. 255p.

Bowman, D.M.J.S., Balch, J.K., Artaxo, P., Bond, W.J., Carlson, J.M., Cochrane, M.A., D'Antonio, C.M. *et al.* 2009. Fire in the Earth system. Science 324:481-484.

Noss, R.F., Platt, W.J., Sorrie, B.A., Weakley, A.S., Means, D.B., Costanza, J. and Peet, R.K. 2015. How global biodiversity hotspots may go unrecognized: Lessons from the North American Coastal Plain. Diversity and Distributions 21:236-244.

Noss, R.F. 2018. *Fire ecology of Florida and the southeastern coastal plain*. University Press of Florida. 336p.

Pausas, J G. and Parr, C.L. 2018. Towards an understanding of the evolutionary role of fire in animals. Evolutionary Ecology 32:113-125.

Pyne, S.J. 2007. Problems, paradoxes, paradigms: triangulating fire research. International Journal of Wildland Fire 16:271–276.

Scott, A.C., Bowman, D.M., Bond, W.J., Pyne, S.J. and Alexander, M.E. 2013. *Fire on Earth: An Introduction*. John Wiley & Sons. 682p.

Whelan, R. J. 1995. The ecology of fire. Cambridge University Press. 346p.
Wright, H.A. and Bailey, A.W. 1982. *Fire ecology: United States and Southern Canada*. John Wiley & Sons. 501p.

Informative Websites: Fire in the Southeastern U.S.

America's Longleaf
Achbold Biological Station
Disney Wilderness Preserve
Florida Forest Service (weather, drought index, etc.)
InterfaceSouth
Jones Research Center
Longleaf Alliance
Ordway Swisher Biological Station
Southeastern Fire Ecology Partnership
Southeastern Region National Cohesive Wildland Fire Strategy
Southern Fire Exchange
Talladega National Forest
Tall Timbers Research Center
USDA - Southern Research Station

Informative Websites: Fire around the world

Association for Fire Ecology
Coalition of Prescribed Fire Councils, Inc.
Fire Effects Information System (FEIS)
Fire Research and Management Exchange System (FRAMES)
FIREWISE
GoodFIRES
Joint Fire Science Program
National Interagency Fire Center
National Interagency Prescribed Fire Training Center
USFS - Fire

Fire-specific journals

International Journal of Wildland Fire
Fire
Fire Ecology
Proceedings of Tall Timber Fire Ecology Conferences

Many other journals publish fire-related research including, but not limited to:

Ecology
Ecological Applications
Forest Ecology and Management
Forest Science
Journal of Forestry
Southern, Western, Northern Journals of Applied Forestry
USDA Forest Service General Technical Reports, Research Notes, and Research Papers

RESOURCES TO HELP YOU SUCCEED

Course Website
The course website can be accessed on Canvas using your myUFL key. The course site will contain readings, announcements, helpful links, and important course information, as well an online grade book. All assignments should be submitted electronically through Canvas unless otherwise notes by your instructors.

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.

Academic Civility
Meaningful and constructive dialogue is encouraged in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. Respect for individual differences and alternative viewpoints will be maintained in this class. One's words and use of language should be temperate and within acceptable bounds of civility and decency. Friendly persuasion wins friends and influences people. Aggressively arguing your point often does the opposite and stops dialogue.

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: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/

Wellness
UF Counseling and Wellness Center offers individual counseling, wellness counseling, couples counseling, problem solving help, CERC crisis services, and other assistance. For more information, visit: http://www.counseling.ufl.edu/cwc/Default.aspx

Students with Disabilities Act
The Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) 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.

Campus Helping Resources
Students experiencing crises or personal problems that interfere with their general well- being 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.

- *University Counseling & Wellness Center,* 3190 Radio Road, 352-392-1575, **www.counseling.ufl.edu/cwc/**
- *U Matter We Care*, **www.umatter.ufl.edu/**
- *Career Resource Center,* First Floor JWRU, 392-1601, **www.crc.ufl.edu/**

UF/IFAS Field and Fork Food Pantry
The Pantry (http://pantry.fieldandfork.ufl.edu) is a resource on the University of Florida campus committed to eradicate food insecurity. Food insecurity is not having a reliable access to nutritious foods for yourself on a regular basis. If you, or anyone you know is experiencing food insecurity, the Pantry is a resource to visit. They offer non-perishable food, toiletries and fresh vegetables grown at the Field and Fork Gardens to provide a well-balanced diet. Protecting the privacy of its guests and providing food to those in need within our campus community is their priority. Guests do not need any proof of need to use this resource, all that is needed is a Gator 1 ID to prove you are a current Student, Faculty or Staff at the University of Florida.

Student Complaints
Residential Course: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

Feedback
Student assessment of instruction is an important part of efforts to improve teaching and learning. We encourage your constructive criticism, suggestions, ideas, and other feedback for improving the course. Please refer to contact information on the first page. Additionally, at the end of the semester, students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

FIRE PARADIGMS SCHEDULE

Date	Topic	Readings to be completed PRIOR to class	Due
Jan. 9	Introduction to course • What is a paradigm? • Brainstorm fire paradigms		
Jan. 16	Paradigms in a changing world • Article discussion • Brainstorm fire paradigms	Fill et al. 2015 Freeman et al. 2017 Cannon et al. 2017	
Jan. 23	Using field data to test paradigms • Article discussion • Brainstorm fire paradigms	Parr & Anderson 2006 Hoffman et al. 2019 McGlinn & Palmer 2019	
Jan. 30	Developing models that challenge paradigms • Article discussion	Naeem 2002 Beckage et al. 2009 Veenendaal et al. 2018	Brief description of topic
Feb. 6	Article discussion	Student-selected	
Feb. 13	Article discussion	Student-selected	
Feb. 20	Article discussion	Student-selected	
Feb. 27	Article discussion	Student-selected	Annotated bibliography
Mar. 5	SPRING BREAK		
Mar. 12	How to complete a peer review		
Mar. 19	TBD		Draft
Mar. 26	TBD		Peer Review
Apr. 2	TBD		
Apr. 9	Group/Individual presentations		Presentation
Apr. 16	TBD		Final Report