



## PALEOBOTANY Spring 2017

**3 Credits, BOT 4935, BOT 5305, GLY 4930, GLY6932**

This course deals with the evolution of plants through geologic time, based upon the fossil record. We begin with the earliest known life on earth and consider the history of major phylogenetic groups of plants through time with attention to changes in morphology and community structure. Topics include the earliest land plants, the first leaves, the first trees, and changes in reproductive biology leading from spores to seeds and pollen and the evolution of flowering plants. We will also emphasize the response of plants to continental rearrangements, extraterrestrial impact, and consider the contributions and response of plants to changes in climate.

An optional field trip is planned for students to gain experience collecting fossil leaves.

**Professor:** Steven Manchester, Florida Museum of Natural History:  
steven@flmnh.ufl.edu

**Lectures:** Wednesday, Friday, period 2 (8:30-9:20 am), Rolfs Hall 105.

**Laboratory:** Friday periods 6, 7 (12:50-2:45 pm), Rolfs Hall 105. Become familiar with fossil specimens representing major plant groups of the Paleozoic, Mesozoic and Cenozoic Eras. Learn techniques for the analysis of fossil pollen, leaves, and stems.

**Textbook:** *The Evolution of Fossil Plants*, 2<sup>nd</sup> Edition, 2014 by K.J. Willis & J.C. McElwain. Oxford University Press.

**Grading Basis:** 3 exams covering lecture and laboratory, 1 lab project; Graduate students are required to give a class presentation on a paleobotanical project of their choice.

**Prereq:** Upper-level course in botany or geology or permission of instructor.

## Schedule of Lecture & Laboratory Topics

1. Introduction to Paleobotany
2. Origin of life, Precambrian diversification  
[Lab A: Modes of fossil preservation; Precambrian fossils]
3. Elaboration multicellular life, radiation of lower plants
4. Origin of land plants, Tracheophytes  
[Lab B: Early Land Plants]
5. Early Lycophytes
6. Lycopods into the Pennsylvanian [Lab C: Lycopods]
7. Reproduction and ecologic setting of Lycopods, Sphenophytes
8. Horsetails  
[Lab D: Sphenophytes]
9. Ferns I
10. Ferns II  
[Lab: E: Ferns]

### Examination I

11. Origin of Lignophytes, Progymnosperms  
[Lab F: Progymnosperms]
12. Origin of Seed plants
13. Paleozoic seed ferns  
[Lab G: Paleozoic seed ferns]
14. II Paleozoic environments
15. Cordaites, early coniferophytes  
[Lab H: Cordaites, Conifers]

### Spring Break

16. Conifer diversification and evolution
17. Mesozoic gymnosperms Cycads, Bennettitales  
[Lab I: Cycads, Bennettitales]
18. Mesozoic gymnosperms continued
19. Bennettitales, Gnetales/Seed plant relationships  
[Lab. J: Palynology]

### Examination II

20. Mesozoic environments  
[Lab K: Cretaceous angiosperms]
21. Angiosperm origins, relationships to other seed plants
22. Angiosperm case histories  
[Lab L: Tertiary angiosperms]
23. Patterns in the evolution of flowers and fruits
24. Diversification of extant angiosperm families  
[Lab M: Angiosperm case histories]
25. Cretaceous/Tertiary boundary, paleoclimate  
[Lab: student presentations]
26. Biotic Interactions through time

### Examination III - Final Exam