



PALEOBOTANY Fall 2023

3 Credits, BOT4935, BOT5305, GLY4930, 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

Meeting times: Monday 1:55–4:55, Wed 3:00–3:50 pm

Lectures: Mon, per.7, Wed per. 8, Rolfs Hall 105.

Laboratory: Mon per. 8, 9 Rolfs Hall 105. Learn to analyze and identify fossil specimens

Office Hours: Flexible, by appointment: steven@ufl.edu

Textbook: Paleobotany and the Evolution of Plants, by Stewart and Rothwell 2010. Cambridge University Press, 978-0521126083

Grading Basis: 3 exams covering lecture and laboratory; 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

2023

- 1: Introduction to Paleobotany [reading: textbook p. 1-30]
- 2: Origin of life, Precambrian diversification. **[Lab A: Modes of fossil preservation; Precambrian fossils]** [reading Ch. 4]
- 3: Origin of land plants, Tracheophytes [Ch. 7, 9]
- 4: Devonian happenings. [Ch. 10, 13]
- 5: Early Lycophytes; isoetalean clade **[Lab B: Early Land Plants]** [Ch. 11]
- 6: **[Lab C. Lycopods]Tour of Paleobotany collections, FLMNH Dickinson Hall. "Adopt a fossil"** {reading: textbook Ch. 3}
- 7: Assigned readings. Grad students initiate projects.
- 8: Sphenophytes. [reading: textbook Ch. 14, 15, 16]
- 9: Ferns; Wrap up: lower vasc plants **[Labs: D, E. Ferns, Sphenophytes];** [reading: textbook Ch. 17-19]
Examination I
- 10: [Origin of Lignophytes, Progymnosperms. **[Lab F. Progymnosperms]**
Origin of Seed plants [reading: textbook Ch. 21]
11. Paleozoic seed ferns **[Lab G. Paleozoic seed ferns]** [reading Ch 22, 23]
Wed. Oct 16: 11. Paleozoic environments; Cordaites [reading Ch. 28]
- Mon. Oct 21: 12. Early coniferophytes **[Lab H: Cordaites, Conifers]**
Wed. Oct 23: 13. Conifer diversification and evolution {reading: textbook Ch. 9}
- Mon. Oct 28: 14. Mesozoic gymnosperms Cycads, Bennettitales. **[Lab I. Cycads, Bennettitales]**
Wed. Oct 30: 15. Gnetales and other gymnosperms continued.
- Mon. Nov 4: 16. Angiosperm origins, relationships to other seed plants **[Lab. J. Cretaceous angiosperms]**
- Wed. Nov 6. **Examination II**
- Mon. Nov 11. **Holiday.**
- Wed. Nov 13. 17. Angiosperm origins, relationships to other seed plants. {reading: textbook Ch. 10}
- Mon. Nov 18. 18. Diversification of extant angiosperm families **[Lab K. Angiosperm case histories]**
- Mon. Nov 25. Student presentations.
- Wed. Nov 27. **Holiday**
- Mon Dec. 2 21 Angiosperm case histories **[Lab L. Tertiary angiosperms]**
- Wed Dec. 4 22. Cretaceous/Tertiary boundary, paleoclimate. Patterns in the evolution of flowers and fruits.
- Mon Dec 9 **Examination III - Final Exam**