

## Bio 395.01. – Evolution of the Iowa Flora – Course Information and Outline

*Description.* Investigations of the seed plants of Iowa from three perspectives: (1) taxonomy and systematics; (2) paleoecology and community assembly; and (3) population structure, biogeography, and conservation. Prerequisite Biology 236 (in future years, Biology 252) or instructor permission.

*Instructor.* Vince Eckhart ([eckhart@grinnell.edu](mailto:eckhart@grinnell.edu), x4354, Science 1210 [office] and Science 1604 [research lab]).

*Setting.* Fall Semester, 2001. Lecture/discussion MWF 11, Science 1021. Lab W 1:15-4:05, Science 1007, the Grinnell College Herbarium, CERA and other field sites.

*Texts.* Gleason HA, Cronquist A (1991). *Manual of vascular plants of northeastern United States and adjacent Canada*. New York Botanical Garden. Zomlefer, WB (1995) *Guide to flowering plant families*. U. of North Carolina Press.

### *Selected supplemental readings and resources*

Anderson WI (1998) Iowa's geological past. U. of Iowa Press, Iowa City.

Axelrod DI (1985) Rise of the grassland biome, central North America. *Botanical Review* 51:163-201.

Eilers LJ, Roosa DM (1994) The vascular plants of Iowa. University of Iowa Press, Iowa City.

Holmgren NH, Holmgren, PK (1998) Illustrated companion to Gleason and Cronquist's manual:

Illustrations of the vascular plants of northeastern United States and adjacent Canada. New York Botanical Garden, New York.

Swink F, Wilhelm G (1994) Plants of the Chicago region. Indiana Academy of Science Press.

Yatskievych G (1999). Steyermark's flora of Missouri. Missouri Bot. Garden, St. Louis.

### *Overview of schedule*

unit 1 = principles of taxonomy and systematics; contemporary Iowa flora

- lecture, discussion, and classroom and lab exercises on plant identification and systematics
- students assemble pressed and photographed plant collections, adding pressed specimens to the Grinnell College and CERA Herbaria, and adding well-documented photographs to the Paul Wilson Plant Image Database
- students read and make presentations on current methods and issues in plant systematics

unit 2 = paleobotany and community assembly

- lecture, discussion, and exercises on the history of the Iowa flora
- field trips to noteworthy sites (e.g., glacial relicts, range limits of distinctive/notable species)
- students collect ideas for grant proposals (see unit 3)

unit 3 = population structure, conservation, and biogeography

- lecture, discussion, and classroom and lab exercises on the current status of the Iowa flora
- students collect background data, prepare, and present grant proposals for projects on conservation of the Iowa flora

Week	Topics/Activities	Readings
31 August	Course introduction	
3-7 September	History and principles of plant systematics Field lab Wednesday Processing field collections	Zomlefer 1-25
10-14 September	Diversity of plant characters, working with keys Field lab Wednesday Grinnell area flora	
17-21 September	Grasses (Poaceae) and Composites (Asteraceae) Wednesday: Dr. Kelley Kindscher (edibles) Field lab = CERA trip with K. Kindscher <b>Friday: Quiz on plant identification</b>	Zomlefer 350-356, 203-211
24-28 September	Other major Iowa plant families Field Lab Wednesday	Zomlefer family descriptions
1-5 October	Species concepts; Sytematics Field Lab Wednesday	Articles
8-12 October	Phenetics and cladistics Current issues in systematics – papers Lab = herbarium and collections workshop	Articles
15-19 October	Current issues in Iowa floristic botany (no lab) <b>Friday – Turn in plant collections</b>	Articles (Ames flora)
FALL BREAK 29 Oct. - 2 Nov.	Iowa geologic and floristic history Field trip Wednesday	Sections from Anderson (1998) Articles
5-9 November	Glacial and post-glacial events; historical influences on modern distributions Field Trip Wednesday	Articles
12-16 November	The “Prairie Problem” Post-settlement changes Field trip Wednesday	Historic and recent writings on the “Prairie Problem”
19-21 November	Issues in plant conservation (e.g., inbreeding, hybridization [including transgenes], fragmentation, exotics, range edges and climate change, interspecific interactions) Lab = Workshop on proposal ideas <b>Turn in paleoecology “popular press” essays</b>	Articles NSF grant proposal guidelines
26-30 Nov. and 3-7 Dec.	Conservation papers & proposal confs. (no labs)	Articles
10-14 Dec.	Grant proposal presentations	Peer review of proposal drafts
Friday, 21 December	<b>Turn in grant proposals</b> (No final exam)	